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SAS® 9.3 National Language Support (NLS)
Reference Guide

SAS® Documentation

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Contents

What's New in the SAS 9.3 National Language Support

Overview

In this release, SAS has expanded the scope and capabilities of National Language Support (NLS). NLS is a set of features that enable a software product to function properly in every global market for which the product is targeted. SAS contains NLS features to ensure that you can write SAS applications that conform to local language conventions. Typically, software that is written in the English language works well for users who use the English language and data that is formatted using the conventions that are observed in the United States. However, without NLS, these products might not work as well for users in other regions of the world. NLS in SAS enables users in regions such as Asia and Europe to process data successfully in their native languages and environments.

General Enhancements

The following enhancements are implemented for SAS 9.3:

- The aliases were updated in the LOCALE= System Option table. For more information, see the LOCALE= table on page 561.
- The European Currency Conversion section was updated with the new members that use the Euro. For more information, see the European conversion section on page 69.

Additional Encodings

The following encodings are new:

Open Edition Katakana (p. 577)
specifies the encoding for Open Edition Katakana

Open Edition Korean (p. 577)
specifies the encoding for Open Edition Korean

Open Edition Simplified Chinese (p. 577)
specifies the encoding for Open Edition Simplified Chinese

Open Edition Traditional Chinese (p. 577)
specifies the encoding for Open Edition Traditional Chinese

Open Edition Japanese (p. 577)
specifies the encoding for Open Edition Japanese

Open Edition Japanese-IBM-939E (p. 577)
specifies the encoding for Open Edition Japanese-IBM-939E

Formats

The following formats are new:

NLDATMTZ (p. 118)
converts the time portion of the SAS date time of the locale to the time of day and time zone

NLDATMWZ (p. 121)
converts SAS date values of the specified locale to the day of week, date time, and time zone

NLDATMZ (p. 125)
converts the SAS date time values to the locale sensitive date time string as the time zone and date time

The following format has been updated:

YEN (p. 237)
The default value has changed from 1 to 8.

Functions

The following functions are new:

ENCODCOMPAT (p. 265)
verifies the transcoding compatibility between two encodings

ENCODISVALID (p. 266)
specifies a valid encoding name

SASMSG (p. 298)
specifies a message from a data set. The returned message is based on the current locale and a specified key.

SASMSGL (p. 301)
specifies a message from a specified data set. The specified message is based on a specified locale value and a specified key value.

SETLOCALE (p. 306)
specifies the locale keys for the current SAS locale

System Options

The following system options are new:

URLENCODING (p. 488)
controls the percent encoding behavior of the URLENCODING and URLDECODE functions

VALIDMEMNAME (p. 488)
specifies the rules for naming SAS data sets, views, and item stores

VALIDVARNAME (p. 489)
specifies the rules for valid SAS variable names that can be created and processed during a SAS session

The following system option is enhanced:

DFLANG (p. 474)
The DFLANG system option supports the locale option.

Recommended Reading

- Base SAS Procedures Guide
- SAS Companion for your operating environment
- SAS/CONNECT User's Guide
- SAS Data Set Options: Reference
- SAS Formats and Informats: Reference
- SAS Functions and CALL Routines: Reference
- SAS/GRAPH: Reference
- SAS Language Reference: Concepts
- SAS Output Delivery System: User's Guide
- SAS System Options: Reference
- SAS Statements: Reference

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Part 1

NLS Concepts

Chapter 1

National Language Support (NLS)

Overview to National Language Support

National Language Support (NLS) is a set of features that enable a software product to function properly in every global market for which the product is targeted. The SAS System contains NLS features to ensure that SAS applications can be written so that they conform to local language conventions. Typically, software that is written in the English language works well for users who use the English language and use data that is formatted using the conventions that are observed in the United States. However, without NLS, these products might not work well for users in other regions of the world. NLS in SAS enables users in regions such as Asia and Europe to process data successfully in their native languages and environments.

SAS provides NLS for data as well as for code under all operating environments and hardware, from the mainframe to the personal computer. This support is especially important to international users who are running applications in a client/server environment. SAS provides NLS for mainframes while maintaining consistency with applications that were developed with previous versions of SAS.

NLS is applied to data that is moved between machines; for example, NLS ensures that the data is converted to the correct format for use on the target machine.

Text-string operations are sensitive to SAS settings for language and region. This action enables correct results for such operations as uppercasing and lowercasing characters, classifying characters, and scanning data. SAS provides features to ensure that national characters, which are characters specific to a particular nation or group of nations, display and print properly.

Software applications that incorporate NLS can avoid dependencies on language-specific or cultural-specific conventions for software features such as:

- character classifications
- character comparison rules
- code sets
- date and time formatting
- interface

- message-text language
- numeric and monetary formatting
- sort order

Definition of Localization and Internationalization

Localization is the process of adapting a product to meet the language, cultural, and other requirements of a specific target environment or market so that users can use their own languages and conventions when using the product. Translation of the user interface, system messages, and documentation is part of localization.

Internationalization is the process of designing a software application without making assumptions that are based on a single language or locale. One goal of internationalization is to ensure that international conventions, including rules for sorting strings and for formatting dates, times, numbers, and currencies, are supported. Another goal is to design the product to have a consistent look, feel, and functionality across different language editions.

Although the application logic might support cultural conventions (for example, the monetary and numeric formats of a particular region), only a localized version of the software presents user interfaces and system messages in the local language.

SAS NLS features are available for localizing and internationalizing your SAS applications.

Chapter 2

Locale for NLS

Overview of Locale Concepts for NLS

A locale reflects the language, local conventions such as data formatting, and culture for a geographical region. Local conventions might include specific formatting rules for dates, times, and numbers and a currency symbol for the country or region. Collating sequence, paper size, postal addresses, and telephone numbers can also be included in locale.

Dates have many representations, depending on the conventions that are accepted in a culture. The month might be represented as a number or as a name. The name might be fully spelled or abbreviated. The order of the month, day, and year might differ according to locale.

For example, “the third day of October in the year 2002” would be displayed in a different way for each of these locales:

Bulgaria
    2002–X-3

Canada
    02–10–03

Germany
    03–10–02

Italy
    3/10/02

United States
    10/03/02

Time can be represented in one English-speaking country or region by using the 12-hour notation, while other English speakers expect time values to be formatted using the 24-hour notation.

Language is part of a locale, but is not unique to any one locale. For example, Portuguese is spoken in Brazil as well as in Portugal, but the cultures are different. In

Brazil and in Portugal, there are similarities in the formatting of data. Numbers are formatted using a comma (,) to separate integers from fractional values and a dot (.) to separate groups of digits to the left of the radix character. However, there are important differences, such as the currency symbols that are used in the two different locales.

Portugal uses the Euro and requires the Euro symbol € while Brazil uses the Real which is represented by the two-character currency symbol R$.

Also, a country might have more than one official language. Canada has two official languages: English and French; two values can be specified for the LOCALE= system option: English_Canada and French_Canada.

Numbers, including currency, can have different representations. For example, the decimal separator, or radix character, is a dot (.) in some regions and a comma (,) in others, while the thousands separator can be a dot, comma, or even a space. Monetary conventions likewise vary between locales; for example, a dollar sign or a yen sign might be attached to a monetary value.

Paper size and measurement are also locale considerations. Standard paper sizes include letter (8-1/2-by-11-inch paper) and A4 (210-by-297-millimeter paper). The letter paper size is mainly used by some English-speaking countries; A4 is used by most other locales. While most locales use centimeters, some locales use inches.

Specifying a Locale

How Locale Is Specified at SAS Invocation

You can use the LOCALE= system option to specify the locale of the SAS session at SAS invocation. LOCALE= also implicitly sets the following SAS system options:

- DATESTYLE=
- DFLANG=
- ENCODING=
- PAPERSIZE=
- TRANTAB=

Windows example:

```
sas9 -locale English_UnitedStates
```

Note: Locale can also be specified using POSIX naming standards. For example, en_US is the POSIX equivalent for the SAS value English_UnitedStates.

Default values for the LOCALE= option are the same under each operating environment. For details, see “LOCALE= Values and Default Settings for ENCODING, PAPERSIZE, DFLANG, and DATESTYLE Options” on page 561.

The English_UnitedStates value for LOCALE= causes the following options to be implicitly set to the specified default values SAS invocation:

- DATESTYLE=MDY
- DFLANG=English
- ENCODING=wlatin1
- PAPERSIZE=Letter

- TRANTAB=(lat1lat1, lat1lat1,wlt1_ucs,wlt1_lcs,wlt1_ccl,,,)

At invocation, an explicitly set system option will override any implicitly set option.

Windows example:

```
sas9 -papersize=A4;
```

At invocation, the explicit setting PAPERSIZE=A4 will override an implicit setting of the PAPERSIZE= option via the LOCALE= option. For details, see "PAPERSIZE= System Option" on page 484.

How Locale Is Specified during a SAS Session

You can use the LOCALE= system option to specify the locale of the SAS session during the SAS session. However, only the values for these system options will change implicitly to reflect the changed value of LOCALE=:

- DATESTYLE=
- DFLANG=
- PAPERSIZE=

The values for these system options will not change implicitly to reflect the changed value of LOCALE=:

- ENCODING=
- TRANTAB=

Note: ENCODING= cannot be reset during a SAS session. It can be set only at invocation.

Note: For more details about the differences between the LOCALE= and ENCODING= options, see "Setting the Encoding of a SAS Session" on page 23.

Windows example:

```
options locale=Italian_Italy;
```

The Italian_Italy value that is assigned to the LOCALE= option causes the following options to be implicitly reset during the SAS session to reflect the changed value of the LOCALE= system option:

- DATESTYLE=DMY
- DFLANG=Italian
- PAPERSIZE=A4

The values for the ENCODING= and TRANTAB= options will not be reset; their former values will be retained.

For details about these system options, see "DATESTYLE= System Option" on page 470.

Language Switching

SAS messages are displayed in the language that is specified by the settings in the SAS configuration file during start up. In the Unicode server, you can view SAS messages in another language by using the Language Switching feature. You can access the Language Switching feature with the LOCALELANGCHG system option. If LOCALELANGCHG is enabled, then the value of the LOCALE system option determines the language for procedure output, user interface elements and ODS fonts. If

LOCALELANGCHG is disabled, then messages will appear in the language that is set during start up. This feature is supported in the Unicode server. For more information, see the “LOCALELANGCHG System Option” on page 481.

Chapter 3

Encoding for NLS

Overview: Encoding for NLS

An encoding maps each character in a character set to a unique numeric representation, which results in a table of all code points. This table is referred to as a code page, which is an ordered set of characters in which a numeric index (code point value) is associated with each character. The position of a character on the code page determines its two-digit hexadecimal number.

For example, the following is the code page for the Windows Latin1 encoding. In the following example, the row determines the first digit and the column determines the

second digit. The numeric representation for the uppercase A is the hexadecimal number 41, and the numeric representation for the equal sign (=) is the hexadecimal number 3D.

Figure 3.1 *Windows Latin1 Code Page*

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	NUL 0000	STX 0001	SOT 0002	ETX 0003	EOT 0004	ENQ 0005	ACK 0006	BEL 0007	BS 0008	HT 0009	LF 000A	VT 000B	FF 000C	CR 000D	SO 000E	SI 000F
10	DLE 0010	DC1 0011	DC2 0012	DC3 0013	DC4 0014	NAK 0015	SYN 0016	ETB 0017	CAN 0018	EM 0019	SUB 001A	ESC 001B	FS 001C	GS 001D	RS 001E	US 001F
20	SP 0020	! 0021	" 0022	# 0023	$ 0024	% 0025	& 0026	' 0027	(0028	) 0029	* 002A	+ 002B	, 002C	- 002D	. 002E	/ 002F
30	0 0030	1 0031	2 0032	3 0033	4 0034	5 0035	6 0036	7 0037	8 0038	9 0039	: 003A	; 003B	< 003C	= 003D	> 003E	? 003F
40	@ 0040	A 0041	B 0042	C 0043	D 0044	E 0045	F 0046	G 0047	H 0048	I 0049	J 004A	K 004B	L 004C	M 004D	N 004E	O 004F
50	P 0050	Q 0051	R 0052	S 0053	T 0054	U 0055	V 0056	W 0057	X 0058	Y 0059	Z 005A	[005B	\ 005C	] 005D	^ 005E	_ 005F
60	` 0060	a 0061	b 0062	c 0063	d 0064	e 0065	f 0066	g 0067	h 0068	i 0069	j 006A	k 006B	l 006C	m 006D	n 006E	o 006F
70	p 0070	q 0071	r 0072	s 0073	t 0074	u 0075	v 0076	w 0077	x 0078	y 0079	z 007A	{ 007B	| 007C	} 007D	~ 007E	DEL 007F
80	€ 20AC		‚ 201A	ƒ 0192	„ 201E	… 2026	† 2020	‡ 2021	ˆ 02C6	‰ 2030	Š 0160	‹ 2039	Œ 0152		Ž 017D	
90		' 2018	' 2019	" 201C	" 201D	• 2022	– 2013	— 2014	˜ 02DC	™ 2122	š 0161	› 203A	œ 0153		ž 017E	Ÿ 0178
A0	NBSP 00A0	¡ 00A1	¢ 00A2	£ 00A3	¤ 00A4	¥ 00A5	¦ 00A6	§ 00A7	¨ 00A8	© 00A9	ª 00AA	« 00AB	¬ 00AC	- 00AD	® 00AE	¯ 00AF
B0	° 00B0	± 00B1	² 00B2	³ 00B3	´ 00B4	µ 00B5	¶ 00B6	· 00B7	¸ 00B8	¹ 00B9	º 00BA	» 00BB	¼ 00BC	½ 00BD	¾ 00BE	¿ 00BF
C0	À 00C0	Á 00C1	Â 00C2	Ã 00C3	Ä 00C4	Å 00C5	Æ 00C6	Ç 00C7	È 00C8	É 00C9	Ê 00CA	Ë 00CB	Ì 00CC	Í 00CD	Î 00CE	Ï 00CF
D0	Ð 00D0	Ñ 00D1	Ò 00D2	Ó 00D3	Ô 00D4	Õ 00D5	Ö 00D6	× 00D7	Ø 00D8	Ù 00D9	Ú 00DA	Û 00DB	Ü 00DC	Ý 00DD	Þ 00DE	ß 00DF
E0	à 00E0	á 00E1	â 00E2	ã 00E3	ä 00E4	å 00E5	æ 00E6	ç 00E7	è 00E8	é 00E9	ê 00EA	ë 00EB	ì 00EC	í 00ED	î 00EE	ï 00EF
F0	ð 00F0	ñ 00F1	ò 00F2	ó 00F3	ô 00F4	õ 00F5	ö 00F6	÷ 00F7	ø 00F8	ù 00F9	ú 00FA	û 00FB	ü 00FC	ý 00FD	þ 00FE	ÿ 00FF

A character set is the set of characters and symbols that are used by a language or group of languages. A character set includes national characters (which are characters specific to a particular nation or group of nations), special characters (such as punctuation marks), the unaccented Latin characters A–Z, the digits 0–9, and control characters that are needed by the computer.

An encoding method is a set of rules that assign the numeric representations to the set of characters. These rules govern the size of the encoding (number of bits used to store the numeric representation of the character) and the ranges in the code page where characters appear. The encoding methods result from the adherence to standards that have been developed in the computing industry. An encoding method is often specific to the computer hardware vendor.

An encoding results from applying an encoding method to a character set.

An individual character can occupy a different position in a code page, depending on the code page used. For example, the German uppercase letter Ä:

- is represented as the hexadecimal number C4 in the Windows Latin1 code page (1252)
- is represented as the hexadecimal number 4A in the German EBCDIC code page (1141)

In the following code page example, German is the character set and EBCDIC is the encoding method.

In the following example, the column determines the first digit and the row determines the second digit.

Figure 3.2 *German EBCDIC Code Page*

HEX DIGITS 1ST → 2ND ↓	4-	5-	6-	7-	8-	9-	A-	B-	C-	D-	E-	F-
-0	(SP) SP010000	& SM030000	- SP100000	ø LC610000	Ø LC620000	¤ SM190000	µ SM170000	¢ SC040000	ä LA170000	ü LU170000	Ö LO160000	0 ND100000
-1	(RSP) SP300000	é LE110000	/ SP120000	É LE120000	a LA010000	j LJ010000	ß LS610000	£ SC020000	A LA020000	J LJ020000	÷ SA060000	1 ND010000
-2	â LA150000	ê LE150000	Â LA160000	Ê LE160000	b LB010000	k LK010000	s LS010000	¥ SC050000	B LB020000	K LK020000	S LS020000	2 ND020000
-3	{ SM110000	ë LE170000	[SM060000	Ë LE180000	c LC010000	l LL010000	t LT010000	• SD630000	C LC020000	L LL020000	T LT020000	3 ND030000
-4	à LA130000	è LE130000	Ã LA140000	È LE140000	d LD010000	m LM010000	u LU010000	© SM520000	D LD020000	M LM020000	U LU020000	4 ND040000
-5	á LA110000	í LI110000	Á LA120000	Í LI120000	e LE010000	n LN010000	v LV010000	@ SM050000	E LE020000	N LN020000	V LV020000	5 ND050000
-6	ã LA190000	î LI150000	Ã LA200000	Î LI160000	f LF010000	o LO010000	w LW010000	¶ SM250000	F LF020000	O LO020000	W LW020000	6 ND060000
-7	å LA270000	ï LI170000	Å LA280000	Ï LI180000	g LG010000	p LP010000	x LX010000	¼ NF040000	G LG020000	P LP020000	X LX020000	7 ND070000
-8	ç LC410000	ì LI130000	Ç LC420000	Ì LI140000	h LH010000	q LQ010000	y LY010000	½ NF010000	H LH020000	Q LQ020000	Y LY020000	8 ND080000
-9	ñ LN190000	~ SD190000	Ñ LN200000	` SD130000	i LI010000	r LR010000	z LZ010000	¾ NF050000	I LI020000	R LR020000	Z LZ020000	9 ND090000
-A	Ä LA180000	Ü LU180000	ö LO170000	: SP130000	« SP170000	ª SM210000	¦ SP030000	¬ SM660000	(SHY) SP320000	¹ ND011000	² ND021000	³ ND031000
-B	. SP110000	$ SC030000	, SP080000	# SM010000	» SP180000	º SM200000	¿ SP160000	‖ SM130000	ô LO150000	û LU150000	Ô LO160000	Û LU160000
-C	< SA090000	* SM040000	% SM020000	§ SM240000	ð LD630000	æ LA510000	Ð LD620000	SM150000	| SM650000	} SM140000	\ SM070000	] SM080000
-D	(SP060000	) SP070000	_ SP090000	' SP050000	ý LY110000	¸ SD410000	Ý LY120000	¨ SD170000	ò LO130000	ù LU130000	Ò LO140000	Ù LU140000
-E	+ SA010000	; SP140000	> SA050000	= SA040000	þ LT630000	Æ LA520000	Þ LT640000	´ SD110000	ó LO110000	ú LU110000	Ó LO120000	Ú LU120000
-F	! SP020000	^ SD150000	? SP150000	" SP040000	± SA020000	¤ SC010000	® SM530000	× SA070000	õ LO190000	ÿ LY170000	Õ LO200000	(EO)

Each SAS session is set to a default encoding, which can be specified by using various SAS language elements.

Difference between Encoding and Transcoding

Encoding establishes the default working environment for your SAS session. For example, the Windows Latin1 encoding is the default encoding for a SAS session under Windows in a Western European locale such as the de_DE locale for German in Germany. For example, the Windows Latin1 code point for the uppercase letter Ä is C4 hexadecimal.

Note: The default encoding varies according to the operating environment and the locale.

However, if you are working in an international environment (for example, you access SAS data that is encoded in German EBCDIC), the German EBCDIC code point for the uppercase letter Ä is 4A hexadecimal. In order for a version of SAS that normally uses Windows Latin1 to properly interpret a data set that is encoded in German EBCDIC, the data must be transcoded. Transcoding is the process of converting data from one encoding to another. When SAS transcodes the Windows Latin1 uppercase letter Ä to the German EBCDIC uppercase letter Ä, the hexadecimal representation for the character is converted from the value C4 to a 4A. For conceptual information, see "Transcoding for NLS" on page 27.

Character Sets for Encoding in NLS

Encodings are available to address the requirements of the character set (few languages use the same 26 characters, A through Z as English). All languages are represented using either of the following classes of character sets:

SBCS (Single-Byte Character Set)
: represents each character in a single (one) byte. A single-byte character set can be either 7 bits (providing up to 128 characters) or 8 bits (providing up to 256 characters). An example of an 8-bit SBCS is the ISO 8859-5 (Cyrillic) character set (represents the Russian characters).

  For details about how SAS uses SBCS encodings, see "Encoding Values in SAS Language Elements" on page 577.

DBCS (Double-Byte Character Set)
: refers to the East Asian character sets (Japanese, Korean, Simplified Chinese, and Traditional Chinese), which require a mixed-width encoding because most characters consist of more than one byte. Although the term DBCS (Double-Byte Character Set) is more commonly used than MBCS (Multi-Byte Character Set), MBCS is more accurate. Some, but not all characters in an East Asian character set do require more than one byte.

  For details about how SAS uses DBCS encodings, see "SAS System Options for Processing DBCS Data" on page 575.

MBCS (Multi-Byte Character Set)
: is used as a synonym for DBCS.

Common Encoding Methods

The encoding methods result from standards developed by various computer hardware manufacturers and standards organizations. For more information, see "Standards Organizations for NLS Encodings" on page 15. The common encoding methods are listed here:

ASCII (American Standard Code for Information Interchange)
: is a 7-bit encoding for the United States that provides 128 character combinations. The encoding contains characters for uppercase and lowercase English, American English punctuation, base 10 numbers, and a few control characters. This set of 128 characters is common to most other encodings. ASCII is used by personal computers.

EBCDIC (Extended Binary Coded Decimal Interchange Code) family
: is an 8-bit encoding that provides 256 character combinations. There are multiple EBCDIC-based encodings. EBCDIC is used on IBM mainframes and most IBM mid-range computers. EBCDIC follows ISO 646 conventions to facilitate translations between EBCDIC encodings and 7-bit (and 8-bit) ASCII-based encodings. The 95 EBCDIC graphical characters include 82 invariant characters (including a blank space), which occupy the same code positions across most EBCDIC single-byte code pages, and also includes 13 variant graphic characters, which occupy varying code positions across most EBCDIC single-byte code pages. For details about variant characters, see "Code Point Discrepancies among EBCDIC Encodings" on page 15.

ISO (International Organization for Standardization) 646 family
: is a 7-bit encoding that is an international standard and provides 128 character combinations. The ISO 646 family of encodings is similar to ASCII except that it has 12 code points for national variants. The 12 national variants represent specific characters that are needed for a particular language.

ISO 8859 family and Windows family
: is an 8-bit extension of ASCII that supports all of the ASCII code points and adds 12 more, providing 256 character combinations. Latin1, which is officially named ISO-8859-1, is the most frequently used member of the ISO 8859 family of encodings. In addition to the ASCII characters, Latin1 contains accented characters, other letters needed for languages of Western Europe, and some special characters. HTTP and HTML protocols are based on Unicode.

Unicode
: provides up to 107,361 character combinations. Unicode can accommodate basically all of the world's languages.

  There are three Unicode encoding forms:

  UTF-8
  : is an MBCS encoding that contains the Latin-script languages, Greek, Cyrillic, Arabic, and Hebrew, and East Asian languages such as Japanese, Chinese and Korean. The characters in UTF-8 are of varying width, from one to four bytes. UTF-8 maintains ASCII compatibility by preserving the ASCII characters in code positions 1 through 128.

  UTF-16
  : is a 16-bit form that contains all of the most common characters in all modern writing systems. Most of the characters are uniformly represented with two bytes,

although there is extended space, called surrogate space, for additional characters that require four bytes.

UTF-32
is a 32-bit form whose characters each occupy 4 bytes.

Other encodings
The ISO 8859 family has other members that are designed for other languages. The following table describes the other encodings that are approved by ISO.

Table 3.1 *Other Encodings Approved by ISO*

ISO Standard	Name of Encoding	Description
ISO 8859-1	Latin 1	US and West European
ISO 8859-2	Latin 2	Central and East European
ISO 8859-3	Latin 3	South European, Maltese and Esperanto
ISO 8859-4	Baltic	North European
ISO 8859-5	Cyrillic	Slavic languages
ISO 8859-6	Arabic	Arabic
ISO 8859-7	Greek	Modern Greek
ISO 8859-8	Hebrew	Hebrew and Yiddish
ISO 8859-9	Turkish	Turkish
ISO 8859-10	Latin 6	Nordic (Inuit, Sámi, Icelandic)
ISO 8859-11	Latin/Thai	Thai
ISO 8859-13	Latin 7	Baltic Rim
ISO 8859-14	Latin 8	Celtic
ISO 8859-15	Latin 9	West European and Albanian

Also, a number of encoding standards have been developed for East Asian languages, some of which are listed in the following table.

Table 3.2 *Some East Asian Language Encodings Approved by ISO*

Standard	Name of Encoding	Description
GB 2312-80	Simplified Chinese	People's Republic of China

Standard	Name of Encoding	Description
CNS 11643	Traditional Chinese	Taiwan
Big-5	Traditional Chinese	Taiwan
KS C 5601	Korean National Standard	Korea
JIS	Japan Industry Standard	Japan
Shift-JIS	Japan Industry Standard multibyte encoding	Japan

There are other encodings in the standards for EBCDIC and Windows that support different languages and locales.

Standards Organizations for NLS Encodings

Encodings that are supported by SAS are defined by the following standards organizations:

International Organization for Standardization (ISO)
: promotes the development of standardization and related activities to facilitate the free flow of goods and services between nations and to advocate for the exchange of intellectual, scientific, and technological information. ISO also establishes standards for encodings.

American National Standards Institute (ANSI)
: coordinates voluntary standards and conformity to those standards in the United States. ANSI works with ISO to establish global standards.

Unicode Consortium
: that develops and promotes the Unicode standard, which provides a unique number for every character.

Code Point Discrepancies among EBCDIC Encodings

Selected characters do not occupy the same code point locations in code maps for all EBCDIC encoding methods. For example, the following characters occupy different code point locations in the respective EBCDIC code maps for U.S. English and German.

Table 3.3 *EBCDIC Code Point Discrepancies for Selected Languages*

EBCDIC Code Points	U.S. English	Finnish	Spanish	Austrian/ German
4A	¢	§	[	Ä

EBCDIC Code Points	U.S. English	Finnish	Spanish	Austrian/ German
4F	|	!	|	!
5A	!	¤	]	Ü
5B	$	Å	$	$
5F	¬	^	¬	^
6A	¦	ö	ñ	ö
79	'	é	'	'
7B	#	Ä	Ñ	#
7C	@	Ö	@	§
A1	~	ü	¨	ß
C0	{	ä	{	ä
D0	}	å	}	ü
E0	\	É	\	Ö

Examples of characters that are commonly used in programming languages are { and $.

These characters are known as variant characters. For example, if a German mainframe user entered an ä, which occupies code point C0, an American compiler would interpret code point C0 as a {.

Collating Sequence

Overview to Collating Sequence

The collating sequence is the order in which characters are sorted. For example, when the SORT procedure is executed, the collating sequence determines the sort order (higher, lower, or equal to) of a particular character in relation to other characters.

The default collating sequence is binary collation, which sorts characters according to each character's location in the code page of the session encoding. (The session encoding is the default encoding for a SAS session. The default encoding can be specified by using various SAS language elements.) The sort order corresponds directly to the arrangement of the code points within the code page. The two single-byte character encoding methods that data processing uses most widely are ASCII and EBCDIC. The OpenVMS, UNIX, and Windows operating environments use ASCII encodings; IBM mainframe computers use EBCDIC encodings.

Binary collation is the fastest type of collation because it is the most efficient for the computer. However, locating characters within a binary-collated report might be difficult if you are not familiar with this method. For example, a binary-collated report lists

words beginning with uppercase characters separately from words beginning with lowercase characters, and words beginning with accented characters after words beginning with unaccented characters. Therefore, for ASCII-based encodings, the capital letter **Z** precedes the lowercase letter **a**. Similarly, for EBCDIC-based encodings, the lowercase letter **z** precedes the capital letter **A**.

You can request an alternate collating sequence that overrides the binary collation. To request an alternate collating sequence, specify one of the following sequences:

- a translation table name
- an encoding value
- linguistic collation

Table 3.4 on page 17 illustrates the results of using different collating sequences to sort a short list of words:

Table 3.4 *Results of Different Collating Sequences*

Binary	Translation Table	Encoding Value	Linguistic
Aaron	aardvark	Aaron	aardvark
Aztec	azimuth	Aztec	Aaron
Zeus	Aaron	Zeus	azimuth
aardvark	Aztec	aardvark	Aztec
azimuth	cote	azimuth	cote
cote	coté	cote	côte
coté	côte	coté	coté
côte	côté	côte	côté
côté	zebra	côté	zebra
zebra	zèbre	zebra	zèbre
zèbre	Zeus	zèbre	Zeus

The first column shows the results of binary collation on characters that are represented in an ASCII-based encoding. The alphabetization is not consistent because of the separate grouping of words that begin with uppercase and lowercase characters. For example, the word Zeus appears before aardvark because of the code points that are assigned to the characters within the ASCII-based encoding.

The second column shows the results of specifying a translation table that alternates the ordering of lowercase and uppercase characters. If you use the translation table, the word aardvark appears before Zeus. However, the word azimuth appears before Aaron because the translation table assigns a weight value to the lowercase character **a** that is less than the weight value of the uppercase character **A**. In addition, accents are sorted from left to right. For example, coté comes before côte.

The third column shows the results of specifying the ASCII-based, double-byte latin1 encoding.

The last column shows the results of linguistic collation for the session locale fr_FR (French_France), which uses a collation algorithm to alphabetize words. The algorithm specifies that words beginning with lowercase characters appear before words beginning with uppercase characters. In addition, this linguistic collation sorts accents from right to left because of the French locale specification.

SAS has adopted the International Components for Unicode (ICU) to implement linguistic collation. The ICU and its implementation of the Unicode Collation Algorithm (UCA) have become a standard. The collating sequence is the default provided by the ICU for the specified locale.

Request Alternate Collating Sequence

To request an alternate collating sequence, use the following SAS language elements:

- SORTSEQ= option in the PROC SORT statement. See "Collating Sequence Option" on page 495.
- SORTSEQ= system option. See "SORTSEQ= System Option: UNIX, Windows, and z/OS" on page 485.

Note that neither method supports all of the collating sequences. For example, only the SORTSEQ= option in the PROC SORT statement supports linguistic collation. However, both the SORTSEQ= option in the PROC SORT statement and the SORTSEQ= system option support translation table collating sequences.

The BASE (V9) engine and the REMOTE engine for SAS/SHARE support all alternate collating sequences. The V9TAPE sequential engine supports the use of a translation table and an encoding value to sort data, but the V9TAPE engine does not support linguistic collation.

Specifying a Translation Table

A translation table is a SAS catalog entry that transcodes data from one single-byte encoding to another single-byte encoding. A translation table also reorders characters when sorting them. A translation table can be one that SAS provides, such as a standard collating sequence like ASCII, EBCDIC, or DANISH; or it can be a user-defined translation table.

When you specify a translation table for an alternate collating sequence, the characters are reordered by mapping the code point of each character to an integer weight value in the range of 0 to 255. A binary collation is then performed.

For collating purposes, you can create translation tables that order characters so that lowercase and uppercase characters alternate. For example, you can create a translation table to correct the situation in which `Z` precedes `a` in an ASCII-based encoding. (However, regardless of the weight assignments in the translation table, it is difficult to achieve a true alphabetic ordering that takes the character case into account.) You can also create a translation table that orders alphabetic characters of a particular language in their expected order.

The TRANTAB procedure creates, edits, and displays translation tables. For example, you can display a translation table to view the character-weight values. The translation tables that are supplied by SAS are stored in the SASHELP.HOST catalog. Any translation table that you create or customize is stored in your SASUSER.PROFILE

catalog. Translation tables have an entry type of TRANTAB. See Chapter 17, "TRANTAB Procedure," on page 533 for more information about translation tables.

You can specify a translation table with the SORTSEQ= option in the PROC SORT statement or with the SORTSEQ= system option. For example, if your operating environment sorts with the ASCII-based Wlatin1 encoding by default, and you want to sort with a translation table that alternates uppercase and lowercase characters, issue the following statements to specify the SAS translation table FRSOLAT1:

```
proc sort data=myfiles.test sortseq=FRSOLAT1;
   by name;
run;
```

A SAS data set that is sorted with a translation table contains a sort indicator that displays the specified translation table name as the collating sequence in CONTENTS procedure output.

Specifying an Encoding Value

An encoding is a set of characters (letters, logograms, digits, punctuation marks, symbols, and control characters) that have been mapped to hexadecimal values, called code points, that computers use. When you specify an encoding value for an alternate collating sequence, the characters are transcoded from the SAS session encoding to the specified encoding, and then a binary collation is performed. You can specify all encoding values that are supported by the ENCODING= option, including multi-byte encodings. Note that specifying a translation table can transcode data, but translation tables are limited to single-byte encodings.

You can specify an encoding value with the SORTSEQ= option in the PROC SORT statement, but you cannot specify an encoding value in the SORTSEQ= system option. For example, you want to sort a SAS data set and then transport it to a Japanese Windows environment. If your session encoding is ASCII-based and binary collation is in effect, you can issue the following statements to specify the ASCII-based double-byte encoding SHIFT-JIS:

```
proc sort data=myfiles.test sortseq='shift-jis';
   by name;
run;
```

Note that SAS checks the encoding value for any translation tables with the same name. If a translation table name exists, SAS uses the translation table.

A SAS data set that is sorted with an encoding value contains a sort indicator that displays the specified encoding value as the collating sequence in CONTENTS procedure output.

Specifying Linguistic Collation

Linguistic collation sorts characters according to rules of language and produces results that are intuitive and culturally acceptable. The results are similar to the collation used in printed materials such as dictionaries, phone books, and book indexes. Linguistic collation is useful for generating reports or other data presentations and for achieving compatibility between systems.

SAS incorporates the International Components for Unicode (ICU), which is an open-source library that provides routines for linguistic collation that are compatible with the Unicode Collation Algorithm (UCA). The UCA is a standard by which Unicode strings can be compared and ordered.

To request linguistic collation, you must use the SORTSEQ= option in the PROC SORT statement because the SORTSEQ= system option does not support linguistic collation. For example, the following statements cause the SORT procedure to collate linguistically, in accordance with the French_France locale:

```
options locale=fr_FR;

proc sort data=myfiles.test sortseq=linguistic;
   by name;
run;
```

When linguistic collation is requested, SAS uses the default linguistic collation algorithm that is provided by the ICU for the SAS session locale. This algorithm reflects the language, local conventions such as data formatting, and culture for a geographical region. You can modify the algorithm by specifying options in parentheses following the LINGUISTIC keyword. For example, you can specify a different locale; you can specify the CASE_FIRST= option to collate lowercase characters before uppercase characters, or vice versa; and so on. Generally, it is not necessary to specify options, because the ICU associates defaults with the various languages and locales. For more information about the linguistic options, see the SORTSEQ= option in "Collating Sequence Option" on page 495 or the SORTSEQ= option in the PROC SORT statement in *Base SAS Procedures Guide*.

A SAS data set that is sorted linguistically contains a sort indicator that displays the collating sequence LINGUISTIC in CONTENTS procedure output. Along with the sort indicator, the data set also records a complete description of the linguistic collating sequence in the file's descriptor information, which is also displayed in CONTENTS procedure output.

Determining the Encoding of a SAS Session and a Data Set

Encoding of a SAS Session

To determine your current SAS session encoding, which is the value assigned to the ENCODING= system option, you can use the OPTIONS procedure or the OPTIONS window. For example, the following PROC OPTIONS statement displays the session encoding value:

```
proc options option=encoding;
run;
```

The SAS log displays the following information:

```
ENCODING=WLATIN1 Specifies default encoding for processing external data.
```

You can also determine the SAS Session Encoding by using the following command:

```
%PUT %SYSFUNC(getOption(ENCODING));
```

Encoding of a SAS Data Set

To determine the encoding of a specific SAS data set, follow these steps:

1. Locate the data set using SAS Explorer.

2. Right-click the data set.
3. Select Properties from the menu.
4. Click the Details tab.

   The encoding of the data set is listed, along with other information.

   You can also determine the encoding by using the following command:

```
%LET DSID=%SYSFUNC(open(sashelp.class,i));
%PUT %SYSFUNC(ATTRC(&DSID,ENCODING));
```

You can display the encoding of any SAS 9 data set by using the CONTENTS procedure or the Properties window in the SAS windowing environment.

An example follows of output that is reported from the CONTENT procedure in the SAS log. The encoding is Western latin1.

Output 3.1 *Encoding Reported in the SAS Log*

```
The SAS System       10:15 Friday, June 06, 2003   1

                                  The CONTENTS Procedure

     Data Set Name     WORK.GRADES                           Observations
 1
     Member Type       DATA                                  Variables
 4
     Engine            V9                                    Indexes
 0
     Created           11:03 Friday, June 06 2003      Observation Length    32
     Last Modified     11:03 Friday, June 06, 2003      Deleted Observations  0
     Protection                                             Compressed
 NO
     Data Set Type                                          Sorted
 NO
     Label
     Data Representation  HP_UX_64, RS_6000_AIX_64, SOLARIS_64, HP_IA64
     Encoding          latin1
Western (ISO)


                            Engine/Host Dependent Information

       Data Set Page Size          4096
       Number of Data Set Pages    1
       First Data Page             1
       Max Obs per Page            126
       Obs in First Data Page      1
       Number of Data Set Repairs  0
       File Name                   C:\TEMP\SAS Temporary
Files\_TD228\grades.sas7bdat
       Release Created             9.0000M0
       Host Created                WIN_NT


                        Alphabetic List of Variables and Attributes

                               #    Variable    Type    Len

                               4    final       Num       8
                               1    student     Char      8
                               2    test1       Num       8
                               3    test2       Num       8
```

Default SAS Session Encoding

The ENCODING= option is used to specify the SAS session encoding, which establishes the environment to process SAS syntax and SAS data sets, and to read and write external files. If neither the LOCALE= nor ENCODING= options is set, a default value is set.

Table 3.5 Default SAS Session Encoding Values

Operating Environment	Default ENCODING= Value	Description
z/OS	OPEN_ED-1047	OpenEdition EBCDIC cp1047-Latin1
UNIX	Latin1	Western (ISO)
Windows	WLatin1	Western (Windows)

For a complete list of supported encoding values for a SAS session, see "Encoding Values for a SAS Session" on page 587.

Setting the Encoding of a SAS Session

You can set the session encoding by using the ENCODING= system option, the DBCS options, or the LOCALE= system option.

Note: Values for the ENCODING= system option depend on the operating environment.

The priority order for setting the encoding is as follows:

1. ENCODING= system option

   The SAS session encoding is determined by the ENCODING= option regardless of whether the DBCS or LOCALE= options are specified. If the ENCODING= option is specified, a set of valid DBCS options are set regardless of whether the user has specified those options. Also, if the ENCODING= option is specified, the LOCALE= option is set to an appropriate value unless a value has been specified by the user.

   Note: If the ENCODING= option is specified, the TRANTAB= option is implicitly set.

2. DBCS options

   Most North and South American and European users use the SAS SBCS environment and do not use the DBCS environment.

   If the ENCODING= option is not specified, the SAS session encoding is determined by the DBCS options regardless of whether the LOCALE= option is specified. The LOCALE= option is set to an appropriate value unless a value has been specified by the user.

   The encoding is determined by the values of the DBCSLANG and DBCSTYPE options for DBCS languages, such as Japanese, Korean, Simplified Chinese, and Traditional Chinese.

   The DBCS options are valid only when the DBCS extension directory is included in the path option list. The path of the DBCS extension dynamic link library (DLLs) has to be located at the top of the pathname list of the path option for the DBCS languages when you want to invoke a DBCS SAS session. The DBCS extension DLLs are located in the directory `!SASROOT/dbcs/sasexe` by default.

   Also you might have to specify the resourcesloc, msg, and sashelp options to use localized resources even if the SAS session encoding is not a DBCS language (for

example, Polish, German, and French). The localized resources are located under **! SASROOT/nls/<language identifier>/<sasmsg, sashelp, sasmacro, resource>**. The values for language identifiers are: cs, de, en, es, fr, hu, it, ja, ko, pl, ru, sv, zh, and zt.

You can specify a sasv9.cfg file located in the localized directories such as **! SASROOT/nls/<language identifier>** so that you do not have to consider using the **path, resourcesloc, sasmsg**, and **sashelp** options.

If DBCS (which specifies that SAS process DBCS encodings) is specified, DBCSLANG= and DBCSTYPE= options are implicitly set. The default values for DBCSTYPE= and DBCSLANG= match those values for the DBCS environment on the host, for example, Japanese, Korean or Chinese.

3. LOCALE= system option

   The SAS session encoding is determined by the LOCALE= option and the platform, if the ENCODING= or DBCS options are not specified.

   The following example shows that encoding is explicitly set by default for the Spanish_Spain locale:

   ```
   sas9 -locale Spanish_Spain
   ```

   The wlatin1 encoding is the default encoding for the Spanish_Spain locale.

   The following example shows that the wlatin2 encoding is set explicitly when SAS is invoked:

   ```
   sas9 -encoding wlatin2
   ```

   Note: Setting DBCS encodings, DBCS options, or a CJK (Chinese, Japanese, Korean) locale on SAS if the DBCS extensions are not available will fail to successfully invoke SAS.

   Note: Changing the encoding for a SAS session does not affect SAS keywords or SAS log output, which remain in English.

In Table 3.6 on page 24 , the following values for the CJK locales are based on locale and platform:

Table 3.6 *Default Encoding Values Based on the LOCALE= Option*

Locales	WIN	MVS	UNX
zh_TW zh_HK zh_MO	MS-950 (ywin)	IBM-937 (yibm)	Solaris on X64, Solaris on SPARC, EUC-TW (yeuc) others: MS-950 (ywin)
zh_CN zh_SG	EUC-CN (zeuc)	IBM-935 (zibm)	EUC-CN (zeuc)
ja_JP	SHIFT-JIS (sjis)	IBM-939 (jibm) IBM-930(j930)	h64, h6i, AIX on Power, SHIFT-JIS (sjis) others: EUC-JP (jeuc)

Locales	WIN	MVS	UNX
ko_KR	EUC-KR (keuc)	IBM-933 (kibm)	EUC-KR (keuc)

Encoding Behavior in a SAS Session

Encoding Support for Data Sets by SAS Release

For Base SAS files, there are three categories of encoding support, which is based on the version of SAS that created the file:

- Data sets that are created in SAS 9 automatically have an encoding attribute, which is specified in the descriptor portion of the file. In SAS 9, DBCS recognizes the DBCSTYPE value and converts it to the encoding value and specifies it in the descriptor portion of the field, by default.
- Data sets that are created in SAS 7 and SAS 8 do not have an encoding value that is specified in the file. It is assumed that SAS 7 and SAS 8 data sets were created in the SAS session encoding of the operating environment. However, the descriptor portion of the file does support an encoding value. When you replace or update a SAS 7 or SAS 8 file in a SAS 9 session, SAS specifies the current session encoding in the descriptor portion of the file, by default. In SAS 8, DBCS has the DBCSTYPE field, instead of the encoding field.
- Data sets created in SAS 6 do not have an encoding value that is associated with the file and cannot have an encoding value specified in the file.

z/OS: Ensuring Compatibility with Previous SAS Releases

Setting the NLSCOMPATMODE system option ensures compatibility with previous releases of SAS.

Note: NLSCOMPATMODE is supported under the z/OS operating environment only.

Programs that were run in previous releases of SAS will continue to work when NLSCOMPATMODE is specified.

The NONLSCOMPATMODE system option specifies that data is to be processed in the encoding that is set by the ENCODING= option or the LOCALE= option, including reading and writing external data and processing SAS syntax and user data.

Some existing programs that ran in previous releases of SAS will no longer run when NONLSCOMPATMODE is in effect. If you have made character substitutions in SAS syntax statements, you must modify your programs to use national characters. For example, a Finnish customer who has substituted the Å character for the $ character in existing SAS syntax will have to update the program to use the $ in the Finnish environment.

For details, see “NLSCOMPATMODE System Option: z/OS” on page 483.

Output Processing

When you create a data set in SAS 9, encoding is determined as follows:

- If a new output file is created, the data is written to the file using the current session encoding.
- If a new output file is created using the OUTREP= option, which specifies a data representation that is different from the current session, the data is written to the file using the default session encoding for the operating system that is specified by the OUTREP= value. For more information, see "OUTREP= Data Set Option" on page 52.
- If a new output file replaces an existing file, the new file inherits the encoding of the existing file. For output processing that replaces an existing file that is from another operating environment or if the existing file has no encoding that is specified in it, then the current session encoding is used.

Input Processing

For input (read) processing in SAS 9, encoding behavior is as follows:

- Most users will choose the default behavior which is not to specify an encoding for the input file.
- If the session encoding and the encoding that is specified in the file are incompatible, the data is transcoded to the session encoding. For example, if the current session encoding is ASCII and the encoding that is specified in the file is EBCDIC, SAS transcodes the data from EBCDIC to ASCII.
- If a file does not have an encoding specified in it, SAS transcodes the data only if the file's data representation is different from the current session.

Reading and Writing External Files

SAS reads and writes external files using the current session encoding. SAS assumes that the external file has the same encoding as the session encoding. For example, if you are creating a new SAS data set by reading an external file, SAS assumes that the encoding of the external file and the current session are the same. If the encodings are not the same, the external data could be written incorrectly to the new SAS data set. For details about the syntax for the SAS statements that perform input and output processing, see "SAS Options That Transcode SAS Data" on page 30.

Chapter 4

Transcoding for NLS

Overview to Transcoding

Transcoding is the process of converting data from one encoding to another. Transcoding is necessary when the SAS session encoding and the encoding of the data are different. Transcoding is often necessary when you move data between operating environments that use different locales and encoding.

For example, consider a file that was created under a UNIX operating environment that uses the Latin1 encoding, then moved to an IBM mainframe that uses the German EBCDIC encoding. When the file is processed on the IBM mainframe, the data is remapped from the Latin1 encoding to the German EBCDIC encoding. If the data contains an uppercase letter Ä, the hexadecimal number is converted from C4 to 4A.

Transcoding does not translate between languages; transcoding remaps characters.

In order to dynamically transcode data between operating environments that use different encodings, an explicit encoding value must be specified. For details, see "Encoding Values in SAS Language Elements" on page 577.

Common Reasons for Transcoding

Some situations where data might commonly be transcoded are:

- when you share data between two different SAS sessions that are running in different locales or in different operating environments
- when you perform text-string operations, such as converting to uppercase or lowercase
- when you display or print characters from another language
- when you copy and paste data between SAS sessions running in different locales

Transcoding and Translation Tables

Specifying LOCALE= or ENCODING= indirectly sets the appropriate translation-table values in the TRANTAB= option. Translation tables are used for transcoding one SBCS encoding to another and back again. For example, there is a specific translation table that maps Windows Latin2 to ISO Latin2.

The following figure shows a translation table. The area of a translation table for mapping from Windows Latin 2 (wlt2) to ISO Latin 2 (lat2) is named "table 1," and the area for mapping characters from ISO Latin 2 to Windows Latin 2 is named "table 2."

Figure 4.1 *SAS Windows Latin 2 to ISO Latin 2 Translation Table*

```
WLT2LAT2 table 1:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '606162636465666768696A6B6C6D6E6F'x
     70 '707172737475767778797A7B7C7D7E7F'x
     80 '808182838485868788898A8A8A8B8A8C'x
     90 '908B8C8D8E8F91929893B994B6BBBEBC'x
     A0 'A0B7A2A3A4A195A7A896AA9799AD9AAF'x
     B0 'B09BB2B3B49C9D9EB8B1BA9FA5BDB5BF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x


WLT2LAT2 table 2:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '606162636465666768696A6B6C6D6E6F'x
     70 '707172737475767778797A7B7C7D7E7F'x
     80 '808182838485868788898B9192939495'x
     90 '909697999BA6A9AB98ACAEB1B5B6B7BB'x
     A0 'A0A5A2A3A4BC8CA7A88AAA8D8FAD8EAF'x
     B0 'B0B9B2B3B4BE9CA1B89ABA9D9FBD9EBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

The LOCALE= or ENCODING= system option and other encoding options (to statements, commands, or procedures) eliminates the need to directly create or manage translation tables.

CAUTION:

Do not change a translation table unless you are familiar with its purpose. Translation tables are used internally by the SAS supervisor to implement NLS. If you are unfamiliar with the purpose of translation tables, do not change the specifications without proper technical advice.

The TRANTAB= option specifies the translation table to be used in the SAS session. For details, see "TRANTAB= System Option" on page 486 . The TRANTAB procedure is used to create, edit, and display customized translation tables. For details, see Chapter 17, "TRANTAB Procedure," on page 533.

SAS Options That Transcode SAS Data

The following SAS options for various language elements enable you to transcode, or to override the default encoding behavior. These elements enable you to specify a different encoding for a SAS file or a SAS application or to suppress transcoding.

Table 4.1 *SAS Options That Transcode SAS Data*

Option	Where Used
CHARSET=	ODS MARKUP statement
CORRECTENCODING=	MODIFY statement of the DATASETS procedure
ENCODING=	%INCLUDE, FILE, FILENAME, INFILE, ODS statements; FILE and INCLUDE commands
ENCODING=	in a DATA step
INENCODING=	LIBNAME statement
ODSCHARSET=	LIBNAME statement for XML
ODSTRANTAB=	LIBNAME statement for XML
OUTENCODING=	LIBNAME statement
XMLENCODING=	LIBNAME statement for XML

For a list of supported encoding values to use for these options, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

Transcoding between Operating Environments

Transcoding occurs automatically when SAS files are moved or accessed across operating environments. Common SAS transcoding activities include:

CPORT and CIMPORT procedures
: To create a transport file, SAS automatically uses translation tables to transcode one encoding to another and back again. First, the data is converted from the source encoding to transport format, then the data is converted from the transport format to the target encoding. For details, see *Base SAS Procedures Guide*.

CEDA (cross environment data access) feature of SAS
: when you process a SAS data set that has an encoding that is different from the current session encoding, SAS automatically uses CEDA software to transcode data. (CEDA also converts a SAS file to the correct data representation when you move a

file between operating environments.) For details, see *SAS Language Reference: Concepts*.

SAS/CONNECT Data Transfer Services (UPLOAD and DOWNLOAD procedures)
For details, see *SAS/CONNECT User's Guide*.

SAS/CONNECT Compute Services (RSUBMIT statement)
identifies a block of statements that a client session submits to server session for processing. For details, see *SAS/CONNECT User's Guide*.

SAS/CONNECT and SAS/SHARE Remote Library Services (LIBNAME)
References a library on a remote machine for client access. For details, see *SAS/CONNECT User's Guide* and *SAS/SHARE User's Guide*.

Transcoding Considerations

Although transcoding usually occurs with no problems, there are situations that can affect your data and produce unsatisfactory results. For example:

- Encodings can conflict with another. That is, two encodings can use different code points for the same character, or use the same code points for two different characters.
- Characters in one encoding might not be present in another encoding. For example, a specific encoding might not have a character for the dollar sign ($). Transcoding the data to an encoding that does not support the dollar sign would result in the character not printing or displaying.
- The number of bytes for a character in one encoding can be different from the number of bytes for the same character in another encoding. For example, transcoding from a DBCS to an SBCS. Therefore, transcoding can result in character value truncation.
- If an error occurs during transcoding such that the data cannot be transcoded back to its original encoding, data can be lost. That is, if you open a data set for update processing, the observation might not be updated. However, if you open the data set for input (read) processing and no output data set is open, SAS issues a warning that can be printed. Processing proceeds and allows a PRINT procedure or other read operation to show the data that does not transcode.
- CEDA has some processing limitations. For example, CEDA does not support update processing.
- Incorrect encoding can be stamped on a SAS 7 or SAS 8 data set if it is copied or replaced in a SAS 9 session with a different session encoding from the data. The incorrect encoding stamp can be corrected with the CORRECTENCODING= option in the MODIFY statement in PROC DATASETS. If a character variable contains binary data, transcoding might corrupt the data.

Compatible and Incompatible Encodings

Overview to Compatible and Incompatible Encodings

ASCII is the foundation for most encodings, and is used by most personal computers, minicomputers, and workstations. However, the IBM mainframe uses an EBCDIC encoding. Therefore, ASCII and EBCDIC machines and data are incompatible. Transcoding is necessary if some or all characters in one encoding are different from the characters in the other encoding.

However, to avoid transcoding, you can create a data set and specify an encoding value that SAS will not transcode. For example, if you use the following values in either the ENCODING= data set option, or the INENCODING=, or the OUTENCODING= option in the LIBNAME statement, transcoding is not performed:

- ANY specifies that no transcoding is desired, even between EBCDIC and ASCII encodings.

  Note: ANY is a synonym for binary. Because the data is binary, the actual encoding is irrelevant.

- ASCIIANY enables you to create a data set that is compatible with all ASCII-based encodings.
- EBCDICANY enables you to create a data set that is compatible with all EBCDIC-based encodings.

You might want to create a SAS data set that contains mixed encodings. For example, both Latin1 and Latin2. You do not want the data transcoded for either input or output processing. By default, data is transcoded to the current session encoding.

Data must be transcoded when the SAS file and the SAS session use incompatible encodings.For example, ASCII and EBCDIC.

In some cases, transcoding is not required because the SAS file and the SAS session have compatible encodings.

For a list of the encodings, by operating environment, see "Encoding Values for a SAS Session" on page 587.

Line-feed Characters and Transferring Data between EBCDIC and ASCII

Software that runs under ASCII operating environments requires the end of the line be specified by the line-feed character. When data is transferred from z/OS to a machine that supports ASCII encodings, formatting problems can occur, particularly in HTML output, because the EBCDIC newline character is not recognized. SAS supports two sets of EBCDIC-based encodings for z/OS:

- The encodings that have EBCDIC in their names use the traditional mapping of EBCDIC line-feed to ASCII line-feed character, which can cause data to appear as one stream.
- The encodings that have Open Edition in their names use the line-feed character as the end-of-line character. When the data is transferred to an operating environment that uses ASCII, the EBCDIC newline character maps to an ASCII line-feed

character. This mapping enables ASCII applications to interpret the end-of-line correctly, resulting in better formatting.

For a list of the encodings, by operating environment, see "Encoding Values for a SAS Session" on page 587.

EBCDIC and OpenEdition Encodings Are Compatible

EBCDIC and OpenEdition are compatible encodings.

Encodings that contain EBCDIC in their names use the traditional mapping of EBCDIC line-feed (0x25) and new-line (0x15) characters.

Encodings that contain OPEN_ED in their names and OpenEdition in their descriptions switch the mapping of the new-line and line-feed characters. That is, they use the line-feed character as the end-of-line character.

If the two encodings use the same code page number but one is EBCDIC and the other is Open Edition, no transcoding is necessary.

Example:

If the data is encoded in EBCDIC1143 and the SAS session is encoded in OPEN_ED-1143, no transcoding is necessary because they use the same 1143 code page.

In order to transfer data between ASCII and EBCDIC, you can specify Open Edition encodings from the list of compatible encodings.

Note: Open Edition encodings are used by default in NONLSCOMPATMODE.

Some East Asian MBCS Encodings Are Compatible

Some East Asian double-byte (DBCS) are compatible encodings. Each line in the list contains compatible encodings:

- SHIFT-JIS, MS-932, IBM-942, MACOS-1
- MS-949, MACOS-3, EUC-KR
- EUC-CN, MS-936, MACOS-25, DEC-CN
- EUC-TW, DEC-TW
- MS-950, MACOS-2, BIG5

If the SAS session is encoded in one of the encodings in the group and the data set is encoded in another encoding, but in the same group, then no transcoding occurs.

Example:

If the session encoding is SHIFT-JIS and the data set encoding is IBM-942, then no transcoding occurs.

Preventing Transcoding

Some encoding values enable you to create a data set that SAS does not transcode. You might not want to transcode data for input or output processing but rather you might want to create a SAS library that contains data in mixed encodings. For example, both Latin1 and Latin2.

For example, you can avoid transcoding if you use the following values in either the ENCODING= data set option or the INENCODING= or OUTENCODING= options in the LIBNAME statement:

- ANY specifies that no transcoding is desired, even between EBCDIC and ASCII encodings.

  Note: ANY is a synonym for binary. Because the data is binary, the actual encoding is irrelevant.

- ASCIIANY specifies that no transcoding is required between any ASCII-based encodings.
- EBCDICANY specifies that no transcoding is required between any EBCDIC-based encodings.

For details, see "ENCODING= Data Set Option" on page 49 and "INENCODING= and OUTENCODING= Options" on page 511.

You can prevent transcoding for a specific column of data while the rest of the character data in the dataset is transcoded by using the TRANSCODE= option. For more information, see "TRANSCODE= Column Modifier on PROC SQL" on page 514.

Avoiding Character Data Truncation by Using the CVP Engine

When you specify the ENCODING= data set option, the encoding for the output data set might require more space than the original data set. For example, when writing DBCS data in a Windows environment using the UTF8 encoding, each DBCS character might require three bytes. To avoid data truncation, each variable must have a width that is 1.5 times greater than the width of the original data.

When you process a SAS data file that requires transcoding, you can request that the CVP (character variable padding) engine expand character variable lengths so that character data truncation does not occur. (A variable's length is the number of bytes used to store each of the variable's values.)

Character data truncation can occur when the number of bytes for a character in one encoding is different from the number of bytes for the same character in another encoding, such as when a single-byte character set (SBCS) is transcoded to a double-byte character set (DBCS) or to a multi-byte character set (MBCS). An SBCS represents each character in one byte, and a DBCS represents each character in two bytes. An MBCS represents characters in a varying length from one to four bytes. For example, when transcoding from Wlatin2 to a Unicode encoding, such as UTF-8, the variable lengths (in bytes) might not be sufficient to hold the values, and the result is character data truncation.

Using the CVP engine, you specify an expansion amount so that variable lengths are expanded before transcoding, then the data is processed. Think of the CVP engine as an intermediate engine that is used to prepare the data for transcoding. After the lengths are increased, the primary engine, such as the default base engine, is used to do the actual file processing.

The CVP engine is a read-only engine for SAS data files only. You can request character variable expansion (for example with the LIBNAME statement) in either of the following ways:

- explicitly specify the CVP engine and using the default expansion of 1.5 times the variable lengths.
- implicitly specifying the CVP engine with the LIBNAME options CVPBYTES= or CVPMULTIPLIER=. The options specify the expansion amount. In addition, you can use the CVPENGINE= option to specify the primary engine to use for processing the SAS file; the default is the default SAS engine.

For example, the following LIBNAME statement explicitly assigns the CVP engine. Character variable lengths are increased using the default expansion, which multiples the lengths by 1.5. For example, a character variable with a length of 10 will have a new length of 15, and a character variable with a length of 100 will have a new length of 150:

```
libname expand cvp ' SAS data-library';
```

Note: The expansion amount must be large enough to accommodate any expansion. Otherwise, truncation will still occur.

Note: For processing that conditionally selects a subset of observations by using a WHERE expression, using the CVP engine might affect performance. Processing the file without using the CVP engine might be faster than processing the file using the CVP engine. For example, if the data set has indexes, the indexes will not be used in order to optimize the WHERE expression if you use the CVP engine.

For more information and examples, see the CVP options in the“LIBNAME Statement” in *SAS Statements: Reference*.

Chapter 5

Double-Byte Character Sets (DBCS)

Overview to Double-Byte Character Sets (DBCS)

Because East Asian languages have thousands of characters, double (two) bytes of information are needed to represent each character.

Each East Asian language usually has more than one DBCS encoding system, due to nonstandardization among computer manufacturers. SAS processes the DBCS encoding information that is unique to each manufacturer for the major East Asian languages.

With the proper software extensions, you can use SAS for the following functions:

- display any of the major East Asian languages in the DBCS version of the SAS System
- import data from East Asian language computers and move the data from one application or operating environment to another (which might require SAS ACCESS or other SAS products)
- convert standard East Asian date and time notation to SAS date values, SAS time values, and SAS datetime values
- create data sets and various types of output (such as reports and graphs) that contain East Asian language characters.

East Asian Languages

East Asian languages include:

- Chinese, which is written in Simplified Chinese script, and is used in the People's Republic of China and Singapore
- Chinese, which is written in Traditional Chinese script, and is used in Hong Kong Special Administrative Region of the People's Republic of China (SAR), Macau SAR, and Taiwan
- Japanese
- Korean

Specifying DBCS

To specify DBCS, use the following SAS system options:

DBCS
recognizes DBCS characters

DBCSLANG=
specifies the language

DBCSTYPE=
specifies the DBCS encoding method type

Example of a SAS configuration file for Windows:

```
/*basic DBCS options */

-dbcs               /*Recognizes DBCS*/
-dbcstype PCMS      /*Specifies the PCMS encoding method*/

-dbcslang JAPANESE; /*specifies the Japanese language */
```

DBCSTYPE= and DBCSLANG= were introduced in Version 6.12. As an alternative, setting ENCODING= implicitly sets the DBCSTYPE= and DBCSLANG= options. For details, see “ENCODING System Option: UNIX, Windows, and z/OS” on page 476.

Requirements for Displaying DBCS Character Sets

In order to display data sets that contain DBCS characters, you must have the following resources:

- system support for multiple code pages
- DBCS fonts that correspond to the language that you intend to use

If you need to create a user-defined character for use with SAS software, your computer must support DBCS. These computers have a limited availability in the U.S. and Europe.

These East Asian language computer systems use various methods of creating the characters. In one popular method, the user types the phonetic pronunciation of the character, often using Latin characters. The computer presents a menu of characters whose sounds are similar to the phonetic pronunciation and prompts the user to select one of them.

When You Can Use DBCS Features

After you have set up your SAS session to recognize a specific DBCS language and operating environment, you can work with your specified language in these general areas:

- the DATA step and batch-oriented procedures
- windowing and interactive capabilities
- cross-system connectivity and compatibility
- access to databases
- graphics

In a DATA step and in batch-oriented procedures, you can use DBCS wherever a text string within quotation marks is allowed. Variable values, variable labels, and data set labels can all be in DBCS. DBCS can also be used as input data and with range and label specifications in the FORMAT procedure. In WHERE expression processing, you can search for embedded DBCS text.

DBCS and SAS on a Mainframe

Another type of DBCS encoding exists on mainframe systems, which combine DBCS support with the 3270-style data stream. Each DBCS character string is surrounded by escape codes called shift out/shift in, or SO/SI. These codes originated from the need for the old-style printers to shift out from the EBCDIC character set, to the DBCS character set. The major manufacturers have different encodings for SO/SI; some manufacturers pad DBCS code with one byte of shift code information while others pad the DBCS code with two bytes of shift code information. These differences can cause problems in reading DBCS information about mainframes.

PCs, minicomputers, and workstations do not have SO/SI but have their own types of DBCS encodings that differ from manufacturer to manufacturer. SAS has several formats and informats that can read DBCS on SO/SI systems:

Table 5.1 *SAS Formats and Informats That Support DBCS on SO/SI Systems*

Keyword	Language Element	Description
$KANJI	informat	Removes SO/SI from Japanese kanji DBCS
$KANJIX	informat	Adds SO/SI to Japanese kanji DBCS
$KANJI	format	Adds SO/SI to Japanese kanji DBCS

Keyword	Language Element	Description
$KANJIX	format	Removes SO/SI from Japanese kanji DBCS

SAS Data Conversion between DBCS Encodings

Normally, DBCS data that is generated on one computer system is incompatible with data generated on another computer system. SAS has features that allow conversion from one DBCS source to another, as shown in the following table.

Table 5.2 *DBCS Conversions*

Language Element	Type	Use	See
KCVT	function	Converts DBCS data from one operating environment to another	"KCVT Function" (p. 272)
CPORT	procedure	Moves files from one environment to another	*Base SAS Procedures Guide*
CIMPORT	procedure	Imports a transport file created by CPORT	*Base SAS Procedures Guide*

Avoiding Problems with Split DBCS Character Strings

- When working with DBCS characters, review your data to make sure that SAS recognizes the entire character string when data is imported or converted or used in a DATA or a PROC step.
- On mainframe systems that use shift out/shift in escape codes, DBCS character strings can become truncated during conversion across operating environments.
- There is a possibility that DBCS character strings can be split when working with the PRINT, REPORT, TABULATE, and FREQ procedures. If undesirable splitting occurs, you might have to add spaces on either side of your DBCS character string to force the split to occur in a better place. The SPLIT= option can also be used with PROC REPORT and PROC PRINT to force string splitting in a better location.

Part 2

Autocall Macros for NLS

Chapter 6

Autocall Macro Entries

Autocall Macro Entries by Category

The following table provides brief descriptions of the SAS NLS autocall macros. For more detailed descriptions, see the NLS entry for each macro.

Category	Language elements	Description
DBCS	%KLOWCASE and %QKLOWCAS Autocall Macros (p. 43)	Change uppercase characters to lowercase.
	%KTRIM and %QKTRIM Autocall Macros (p. 44)	Trim trailing blanks.
	%KVERIFY Autocall Macro (p. 44)	Returns the position of the first character unique to an expression.

Dictionary

%KLOWCASE and %QKLOWCAS Autocall Macros

Change uppercase characters to lowercase.

Category: DBCS

Requirement: MAUTOSOURCE system option

Syntax

%KLOWCASE (text | text expression)

%QKLOWCAS (text | text expression)

Details

The %KLOWCASE and %QKLOWCAS macros change uppercase alphabetic characters to their lowercase equivalents. If the argument might contain a special character or mnemonic operator, listed below, use %QKLOWCAS.

%KLOWCASE returns a result without quotation marks, even if the argument has quotation marks. %QKLOWCAS produces a result with the following special characters and mnemonic operators masked so the macro processor interprets them as text instead of as elements of the macro language:

& % ' " ( ) + - * / < > = ¬ ^ ~ ; , blank AND OR NOT EQ NE LE LT GE GT IN

Autocall macros are included in a SAS library. This library might not be installed at your site or might be a site-specific version. If you cannot access this macro or if you want to find out if the library is a site-specific version, see your on-site SAS support personnel.

%KTRIM and %QKTRIM Autocall Macros

Trim trailing blanks.

Category: DBCS

Requirement: MAUTOSOURCE system option

Syntax

%KTRIM (text | text expression)

%QKTRIM (text | text expression)

Details

The KTRIM macro and the QKTRIM macro trim trailing blanks. If the argument contains a special character or mnemonic operator, listed below, use %QKTRIM.

QKTRIM produces a result with the following special characters and mnemonic operators masked so the macro processor interprets them as text instead of as elements of the macro language:

& % ' " ( ) + - * / < > = ¬ ? ~ ; , # blank AND OR NOT EQ NE LE LT GE GT IN

Autocall macros are included in a SAS library. This library might not be installed at your site or might be a site-specific version. If you cannot access this macro or if you want to find out if the library is a site-specific version, see your on-site SAS support personnel.

%KVERIFY Autocall Macro

Returns the position of the first character unique to an expression.

Category: DBCS

Requirement: MAUTOSOURCE system option

Syntax

%KVERIFY (source, excerpt)

Syntax

source
is text or a text expression that you want to examine for characters that do not exist in excerpt.

excerpt
is text or a text expression that defines the set of characters that %KVERIFY uses to examine source.

Details

%KVERIFY returns the position of the first character in source that is not also present in excerpt. If all characters in source are present in excerpt, %KVERIFY returns 0.

Autocall macros are included in a SAS library. This library might not be installed at your site or might be a site-specific version. If you cannot access this macro or if you want to find out if the library is a site-specific version, see your on-site SAS support personnel.

Part 3

Data Set Options for NLS

Chapter 7

Data Set Option Entries

Data Set Options by Category

NLS affects the data set control category of options for selected data set options. The following table provides brief descriptions of the data set options. For more detailed descriptions, see the dictionary entry for each data set option:

Category	Language elements	Description
Data Set Control	ENCODING= Data Set Option (p. 49)	Overrides the encoding to use for reading or writing a SAS data set.
	OUTREP= Data Set Option (p. 52)	Specifies the data representation for the output SAS data set.

Dictionary

ENCODING= Data Set Option

Overrides the encoding to use for reading or writing a SAS data set.

Valid in: DATA step and PROC steps

Category: Data Set Control

Syntax

ENCODING= ANY | ASCIIANY | EBCDICANY | *encoding-value*

Syntax Description

ANY
specifies that no transcoding occurs.

Note: ANY is a synonym for binary. Because the data is binary, the actual encoding is irrelevant.

ASCIIANY
specifies that no transcoding occurs when the mixed encodings are ASCII encodings.

EBCDICANY
specifies that no transcoding occurs when the mixed encodings are EBCDIC encodings.

encoding-value
specifies an encoding value.

See: "Encoding for NLS" on page 9

Details

The value for ENCODING= indicates that the SAS data set has a different encoding from the current session encoding. When you read data from a data set, SAS transcodes the data from the specified encoding to the session encoding. When you write data to a data set, SAS transcodes the data from the session encoding to the specified encoding.

Input Processing

By default, encoding for input processing is determined as follows:

- If the session encoding and the encoding that is specified in the file are different, SAS transcodes the data to the session encoding.
- If a file has no encoding specified, but the file's data representation is different from the encoding of the current session, then SAS transcodes the data to the current session.

Output Processing

By default, encoding for output processing is determined as follows:

- Data is written to a file using the encoding of the current session, except when a different output representation is specified using the OUTREP= data set option, the OUTENCODING= option in the LIBNAME statement, or the ENCODING= data set option.
- If a new file replaces an existing file, then the new file inherits the encoding of the existing file.
- If an existing file is replaced by a new file that was created under a different operating environment or that has no encoding specified, the new file uses the encoding of the current session.

Note: Character metadata and data output appears garbled if you specify a different encoding from where the data set was created.In this example, the data set to be printed is internally encoded as ASCII, however the data set option specifies an EBCDIC encoding. SAS attempts to transcode the data from EBCDIC to ASCII, but the data is already in ASCII. The result is garbled data.

```
data a;
x=1;
abc='abc';
run'
```

```
proc print data=a (encoding="ebcdic");
run;
```

Note: The following values for ENCODING= are invalid:

- UCS2
- UCS4
- UTF16
- UTF32

Comparisons

- Session encoding is specified using the ENCODING= system option or the LOCALE= system option, with each operating environment having a default encoding.
- You can specify encoding for a SAS library by using the LIBNAME statement's INENCODING= option (for input files) and the OUTENCODING= option (for output files). If both the LIBNAME statement option and the ENCODING= data set option are specified, SAS uses the data set option.

Examples

Example 1: Creating a SAS Data Set with Mixed Encodings and with Transcoding Suppressed

By specifying the data set option ENCODING=ANY, you can create a SAS data set that contains mixed encodings, and suppress transcoding for either input or output processing.

In this example, the new data set MYFILES.MIXED contains some data that uses the Latin1 encoding, and some data that uses the Latin2 encoding. When the data set is processed, no transcoding occurs. For example, the correct Latin1 characters in a Latin1 session encoding and correct Latin2 characters in a Latin2 session encoding are displayed.

```
libname myfiles 'SAS data-library';
data myfiles.mixed (encoding=any);
   set work.latin1;
   set work.latin2;
run;
```

Example 2: Creating a SAS Data Set with a Particular Encoding

For output processing, you can override the current session encoding. This action might be necessary, for example, if the normal access to the file uses a different session encoding.

For example, if the current session encoding is Wlatin1, you can specify ENCODING=WLATIN2 in order to create the data set that uses the encoding Wlatin2. The following statements tell SAS to write the data to the new data set using the Wlatin2 encoding instead of the session encoding. The encoding is also specified in the descriptor portion of the file.

```
libname myfiles 'SAS data-library';
data myfiles.difencoding (encoding=wlatin2);
      .
      .
```

```
      .
run;
```

Example 3: Overriding Encoding for Input Processing

For input processing, you can override the encoding that is specified in the file, and specify a different encoding.

For this example, the current session encoding is EBCDIC-870, but the file has the encoding value EBCDIC-1047 in the descriptor information. By specifying ENCODING=EBCDIC-870, SAS does not transcode the data, but instead displays the data using EBCDIC-870 encoding.

```
proc print data=myfiles.mixed (encoding=ebcdic870);
run;
```

See Also

- Conceptual discussion in "Encoding for NLS" on page 9

Options in Statements and Commands:

- "ENCODING= Option" on page 507
- "INENCODING= and OUTENCODING= Options" on page 511

System Options:

- "ENCODING System Option: UNIX, Windows, and z/OS" on page 476
- "LOCALE System Option" on page 480

OUTREP= Data Set Option

Specifies the data representation for the output SAS data set.

Valid in: DATA step and PROC steps

Category: Data Set Control

See: "OUTREP= Data Set Option" in *SAS Data Set Options: Reference*.

Part 4

Formats for NLS

Chapter 8

Overview to NLS Formats

International Date and Datetime Formats

SAS supports international formats that are equivalent to some of the most commonly used English-language date formats. In each case the format works like the corresponding English-language format. Only the maximum, minimum, and default widths are different.

Table 8.1 *International Date and Datetime Formats*

Language	English Format	International Format	Min	Max	Default
Afrikaans (AFR)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10

Language	English Format	International Format	Min	Max	Default
	WEEKDATX.	NLDATEW.	10	200	20
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Catalan (CAT)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEW.	10	200	20
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Croatian (CRO)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	40	27
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Czech (CSY)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	2	40	25
	WEEKDAY.	NLDATEWN.	4	200	10

Language	English Format	International Format	Min	Max	Default
	WORDDATX.	NLDATE.	10	200	20
Danish (DAN)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	2	31	31
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Dutch (NLD)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	2	38	28
	WORDDATX.	NLDATE.	10	200	20
	WEEKDAY.	NLDATEWN.	4	200	10
Finnish (FIN)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	2	37	37
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
French (FRA)	DATE.	NLDATE.	10	200	20

Language	English Format	International Format	Min	Max	Default
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	27	27
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
German (DEU)	DATE.	NLDATE.	105	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	30	30
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Hungarian (HUN)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	40	28
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Italian (ITA)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10

Language	English Format	International Format	Min	Max	Default
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	28	28
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Macedonian (MAC)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	40	29
	WEEKDDATX.	EURDFWDX.	1	32	1
	WORDDATX.	NLDATEWN.	4	200	10
Norwegian (NOR)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	26	26
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Polish (POL)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	20	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10

Language	English Format	International Format	Min	Max	Default
	WEEKDATX.	NLDATEWX.	2	40	34
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Portuguese (PTG)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	38	38
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATEWX.	10	200	20
Russian (RUS)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	2	40	29
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Spanish (ESP)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	1	35	35
	WEEKDAY.	NLDATEWN.	4	200	10

Language	English Format	International Format	Min	Max	Default
	WORDDATX.	NLDATE.	10	200	20
Slovenian (SLO)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	40	29
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Swedish (SVE)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	26	26
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Swiss_French (FRS)	DATE.	NLDATE.	10	200	20
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	26	26
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20
Swiss_German (DES)	DATE.	NLDATE.	10	200	20

Language	English Format	International Format	Min	Max	Default
	DATETIME.	NLDATM.	10	200	30
	DOWNAME.	NLDATEWN.	4	200	10
	MONNAME.	NLDATEMN.	4	200	10
	MONYY.	NLDATEYM.	6	200	10
	WEEKDATX.	NLDATEWX.	3	30	30
	WEEKDAY.	NLDATEWN.	4	200	10
	WORDDATX.	NLDATE.	10	200	20

Currency Representation

Overview to Currency

Currency is the medium of exchange, which is specific to a country. SAS provides formats and informats for reading and writing currency.

U.S. Dollars

The DOLLARw.d formats and informats were first introduced to read and write American currency. DOLLARw.d

- uses the dollar sign ($) currency symbol to precede U.S. currency
- uses a comma (,) as the thousands separator and a dot (.) as the decimal separator.

Example:

```
$12,345.00
```

DOLLARXw.d also writes currency with a leading dollar sign ($), but uses a dot (.) as the thousands separator and a comma (,) as the decimal separator. The reversal of the dot and comma for currency formatting is a convention used in many European countries.

Example:

```
 $12.345,00
```

Limitations of the DOLLAR formats and informats are:

- the lack of support for all currency symbols
- the reversal of the dot and comma for currency formatting is not used by all European countries.
- the appearance of the currency symbol will vary by computer (an EBCDIC-based computer and an ASCII-based computer render characters differently).

Localized Euros

The EUROw.d formats and informats were introduced to support the euro currency that was established by the European Monetary Union (EMU), which was formed in 1999. EUROw.d

- uses the euro (e) currency symbol to precede Euro currency data
- uses a comma (,) as the thousands separator and a dot (.) as the decimal separator.

Example:

```
options locale=English_UnitedKingdom;
x=12345;
put x euro10.2;
run;
```

Output:

```
 e12.345,00
```

Limitations of the EURO formats and informats are:

- the reversal of the dot and comma for currency formatting is not used by all European countries.
- euros are limited only to members of the EMU
- the specific value of the locale is required.

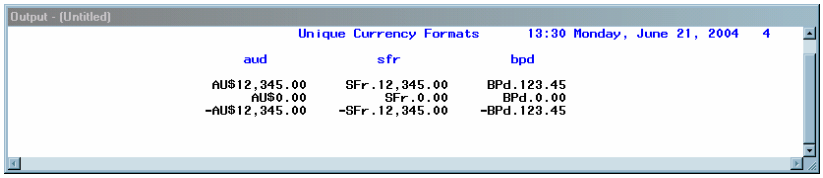
Customized Currency Representations

To create a customized currency representation, you can use the FORMAT procedure. The following example shows the creation of unique formats for the Australian dollar, the Swiss franc, and the British pound. For details about the FORMAT procedure, see *Base SAS Procedures Guide*.

Example Code 8.1 *SAS Code That Customizes Currency Representations*

```
proc format;

   picture aud low-<0='0,000,000,009.00'
               (prefix='-AU$' mult=100)
               0-high='0,000,00,009.00 '
               (prefix='AU$' mult=100);

   picture sfr low-<0='0,000,000,009.00'
               (prefix='-SFr.' mult=100)
               0-high='0,000,00,009.00 '
               (prefix='-SFr.' mult=100);

   picture bpd low-<0='0,000,000,009.00'
               (prefix='-BPd.' mult=100)
               0-high='0,000,00,009.00 '
               (prefix='BPd.' mult=100);

run;
data currency;
```

```
input aud sfr bpd 12.2;
datalines;
12345 12345 12345
0 0 0
-12345 -12345 -12345
;

proc print data=currency noobs;
   var aud sfr bpd;
   format aud aud. sfr sfr. bpd bpd.;
   title 'Unique Currency Formats';
run;
```



Customizing currency representations offers flexibility, but requires a programming solution.

Localized National and International Currency Representations

The NLMNYw.d and NLMNYIw.d formats and informats were introduced to represent localized currency in two forms:

Localized national currency representation
reflects the customs and conventions of the locale. National formats are specified using the NLMNYw.d formats and informats. You must also use the LOCALE= option to specify the locale when using the NLMNYw.d formats and informats.

Example: **`options locale=english_UnitedStates; data _null_; x=12345; put x nlmny15.2; run;`**

Output:

`$12,345.00`Selected national currency representations follow:

Table 8.2 *Localized National Currency Representations*

LOCALE=	Currency	National Representation
English_UnitedStates	U.S. dollars	$12,345.00
French_Canada	Canadian dollars	12 345,00 $
French_France	French euros	12 345,00 e
French_Switzerland	Swiss francs	SFr. 12'345.00
German_Germany	German euros	12.345,00 e
German_Luxembourg	Luxembourg euros	12.345 e

LOCALE=	Currency	National Representation
Spanish_Spain	Spanish euros	12.345,00 e
Spanish_Venezuela	Venezuelan euros	Bs12.345,00

The localized renderings show the native customs for representing currency. For example, although these selected EMU countries might use the same euro currency, their depiction of the currency varies. Whereas French_France uses no thousands separator but uses a comma as a decimal separator, German_Germany and Spanish_Spain use a dot as a thousands separator and a comma as a decimal separator.

Localized International currency representation
conforms to ISO standard 4217. International forms are specified using the NLMNYIw.d formats and informats. International forms are commonly used to show a comparison of world currencies; for example, for airline ticket, trade, and stock market pricing. You must also use the LOCALE= option to specify the locale when using the NLMNYIw.d formats and informats. The letter "I," which signifies "International," is appended to the format and informat names.

Example: **`options locale=english_UnitedStates; data _null_; x=12345; put x nlmnyi15.2; run;`** Output: **`USD12,345.00`**

Selected international currency representations follow:

Table 8.3 *International Currency Representations by Locale (ISO standard 4217)*

LOCALE=	Currency	International Representation
English_UnitedStates	U.S. dollars	USD12,345.00
French_Canada	Canadian dollars	12,345.00 CAD
French_France	French euros	12 345,00 EUR
French_Luxembourg	Luxembourg euros	12,345.00 EUR
German_Germany	German euros	12,345.00 EUR
German_Switzerland	Swiss francs	CHF 12,345.00
Spanish_Spain	Spanish euros	12,345.00 EUR
Spanish_Venezuela	Venezuelan bolivars	VEB12,345.00

The international renderings also reflect native customs for representing currency. For example, although all locales use a comma as the thousands separator and a dot as the decimal separator, they vary the placement of the ISO currency code. Whereas the EMU countries put the currency code after the currency, English_UnitedStates, German_Switzerland, and Spanish_Venezuela precede the currency with the ISO code.

For a complete list of the ISO standard 4217 currency codes, see www.bsi-global.com/Technical%2BInformation/Publications/_Publications/tig90x.doc.

A primary limitation of using localized national and international currency representations is their dependence on a value for the LOCALE= system option.

Unique National and International Monetary Representations

The NLMNL*ISO*w.d and NLMNI*ISO*w.d formats and informats were introduced to uniquely represent each currency without having to also use the LOCALE= option to specify the locale. Each currency is specified by a unique ISO standard 4217 currency code.

Unique national monetary representation
is specified by the unique ISO currency code. National formats are specified using the NLMNL*ISO*w.d formats and informats. In the following example, USD is the ISO currency code for American dollars.

Note: When using the NLMNL*ISO*w.d formats and informats, you do not use the LOCALE= option to specify the locale.

Example: `data _null_; x=12345; put x nlmnlusd15.2; run;`

Output:

`US$12,345.00` Selected unique national currency representations follow:

Table 8.4 *Unique Currency Representations by ISO Currency Code*

ISO Currency Code	Currency	National Representation
USD	U.S. dollars	USD$12,345.00
CAD	Canadian dollars	CA$12,345.00
EUR	French euros	e12,345.00
CHF	Swiss francs	SFr.12,345.00
EUR	German euros	e12,345.00
EUR	Luxembourg euros	e12,345.00
EUR	Spanish euros	e12,345.00
VEB	Venezuelan bolivars	Not found

A currency symbol or a currency code precedes most currencies. Also used are a comma as the thousands separator and a dot as the decimal separator. If the currency symbol of the local currency is not supported in the current SAS session encoding, the NLMNLxxxw.d format will format the value with the 3-letter ISO currency code.

Unique international monetary representation
is specified by the unique ISO currency code. International formats are specified using the NLMNI*ISO*w.d formats and informats. International forms are commonly used to show a comparison of world currencies; for example, for airline ticket, trade,

and stock market pricing. The letter “I”, which signifies “International”, is appended to the format and informat names. In the following example, USD is the ISO currency code for American dollars.

Note: When using the NLMNI*ISO*w.d formats and informats, you do not use the LOCALE= option to specify the locale.

Example: **`data _null_; x=12345; put x nlmni15.2; run;`**Output: **`USD12,345.00`**

Selected international currency representations follow:

Table 8.5 *International Currency Representations by ISO Currency Code*

ISO Currency Code	Currency	International Representation
USD	U.S. dollars	USD12,345.00
CAD	Canadian dollars	CAD12,345.00
EUR	French euro	EUR12,345.00
CHF	Swiss francs	CHF12,234.00
EUR	German euros	EUR12,345.00
EUR	Luxembourg euros	EUR12,345.00
EUR	Spanish euros	EUR12,345.00
VEB	Venezuelan bolivars	Not found

The international renderings precede the currency with the appropriate ISO code. Also used are a comma as the thousands separator and a dot as the decimal separator.

Example: Representing Currency in National and International Formats

This SAS program uses the exchange rates for selected Asia-Pacific countries against the U.S. dollar. In the output, each country's currency is represented using a national and an international format.

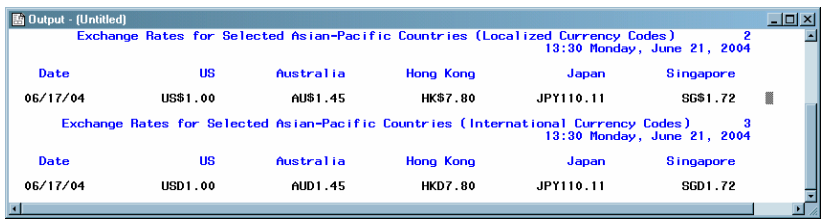
Example Code 8.2 *SAS Code That Formats National and International Currency Formats*

```
data curr;

input ex_date mmddyy. usd aud hkd jpy sgd 12.2;

datalines;

061704 1.00000 1.45349 7.79930 110.110 1.71900  1
```

```
;

proc print data=curr noobs label;

        var ex_date usd aud hkd jpy sgd;

        format ex_date mmddyy. usd nlmnlusd15.2 aud nlmnlaud15.2 hkd
nlmnlhkd15.2
                            jpy nlmnljpy15.2 sgd nlmnlsgd15.2;
2

        label ex_date='Date' usd="US" aud='Australia' hkd='Hong Kong'

                             jpy='Japan' sgd='Singapore';

        title 'Exchange Rates for Selected Asian-Pacific Countries
                (Localized Currency Codes)';



proc print data=curr noobs label;

        var ex_date usd aud hkd jpy sgd;

        format ex_date mmddyy. usd nlmniusd15.2 aud nlmniaud15.2 hkd
nlmnihkd15.2
                            jpy nlmnijpy15.2 sgd nlmnisgd15.2;
3

        label ex_date='Date' usd="US" aud='Australia' hkd='Hong Kong'

                             jpy='Japan' sgd='Singapore';

        title 'Exchange Rates for Selected Asian-Pacific Countries
                (International Currency Codes)';

run;
```

1. These exchange rates, which were effective June 17, 2004, are specified as data in the SAS program.
2. These NLMNL*ISO* formats are applied to each of the numeric data items that are specified in the INPUT statement. These formats show currencies in the appropriate national formats.
3. These NLMNI*ISO* formats are applied to each of the numeric data items that are specified in the INPUT statement. These formats show currencies in the appropriate international formats.

Display 8.1 *National and International Format Output*



European Currency Conversion

Overview to European Currency Conversion

SAS enables you to convert European currency from one country's currency to an equivalent amount in another country's currency. You can also convert a country's currency to euros, and you can convert euros to a specific country's currency.

SAS provides a group of formats, informats, and a function to use for currency conversion. The set of formats EURFR*ISO* can be used to convert specific European currencies to an amount in euros. *ISO* represents an ISO standard 4214 currency code. For a complete list of the ISO standard 4217 currency codes, see www.bsi-global.com/Technical%2BInformation/Publications/_Publications/tig90x.doc.

Fixed Rates for Euro Conversion

Twenty-seven European countries comprise the EMU (European Monetary Union). The conversion rates for 17 countries are fixed, and are incorporated into the EURFR*ISO* and EURTO*ISO* formats and into the EUROCURR function. The following table lists the currency codes and conversion rates for the specific currencies whose rates are fixed.

Table 8.6 *Fixed Rates for Euro Conversion*

ISO Currency Code	Conversion Rate	Currency
ATS	13.7603	Austrian schilling
BEF	40.3399	Belgian franc
CYP	0.585274	Cyprus pound
DEM	1.95583	Deutsche mark
ESP	166.386	Spanish peseta
EEK	15.6466	Estonian kroon
EUR	1	Euro
FIM	5.94573	Finnish markka
FRF	6.55957	French franc
GRD	340.750	Greek drachma
IEP	0.787564	Irish pound
ITL	1936.27	Italian lira
LUF	40.3399	Luxembourg franc

ISO Currency Code	Conversion Rate	Currency
MTL	0.429300	Maltese lira
NLG	2.20371	Dutch guilder
PTE	200.482	Portuguese escudo
SIT	239.640	Slovenian tolars
SKK	30.1260	Slovak koruna

Variable Rates for Euro Conversion

For 13 countries in the EMU, currency conversion rates can fluctuate. The conversion rates for these countries are stored in an ASCII text file that you reference with the EURFRTBL fileref. For example you can store the variable rates in a file named variableRates.txt, and reference the file with the **`Filename EURFRTBL "variables.txt";`** statement. The contents of variableRages.txt could be:

```
EURFRCHF=1.5260
EURFRPLZ=1.3650
```

You can convert Polish xloty to euros with the following code:

```
data _null;
x=12345;
put x eurfrplz15.2;
run;
```

```
output:
€2.939,29
```

Example: Converting Between a European Currency and Euros

The following example shows the conversion from Belgian francs to euros. The EURFRBEF format divides the country's currency amount by the exchange rate:

```
CurrencyAmount / ExchangeRate
12345 / 40.3399
```

Example Code 8.3 *Example Code: Conversion from Belgian Francs to Euros*

```
data _null_
x=12345 /*convert from Belgian francs to euros*/
put x eurfrbef15.2;
run;
```

Output:

```
e306,02
```

The following example shows the conversion of euros to Belgian francs. The EURTOBEF format multiplies euros by the target currency's exchange rate:

```
EurosAmount * ExchangeRate
12345 * 40.3399


data _null_
x=12345; /*convert from euros to Belgian francs*/
put x eurtobef15.2;
run;
```

Output:

```
497996.07
```

Direct Conversion Between European Currencies

The EUROCURR function uses the conversion rate tables to convert between currencies. For conversion between the currencies of two countries,

1. SAS converts the amount to euros.

   Note: SAS stores the intermediate value as precisely as the operating environment allows, and does not round the value.

2. SAS converts the amount in euros to an amount in the target currency.

```
SourceCurrencyAmount → EurosAmount → TargetCurrencyAmount

BelgianFrancs → euros
12345 / 40.3399 = 306.02456 euros

Euros → FrenchFrancs
306.02456 * 6.55957 = 2007.3895 French francs


data _null_;
x=eurocurr(12345,'bef','frf'); /*convert from Belgian francs to French francs*/
put x=;
run;
```

Output:

```
x=2007.389499
```

SAS converts Belgian francs to euros, and then euros to French francs.

Chapter 9

Format Entries

Categories of NLS Formats

The following categories relate to NLS issues:

Category	Description
BIDI text handling	Instructs SAS to write bidirectional data values from data variables.
Character	Instructs SAS to write character data values from character variables.
Currency Conversion	Instructs SAS to convert an amount from one currency to another currency.
DBCS	Instructs SAS to translate double-byte-character sets that are used in Asian languages.
Hebrew text handling	Instructs SAS to read Hebrew data from data variables.
International Date and Time	Instructs SAS to write data values from variables that represent dates, times, and datetimes.
Numeric	Instructs SAS to write numeric data values from numeric variables.

Category	Language elements	Description
BIDI text handling	$BIDIw. Format (p. 86)	Converts between a logically ordered string and a visually ordered string, by reversing the order of Hebrew and Arabic characters while preserving the order of Latin words and numbers.
	$LOGVSw. Format (p. 97)	Processes a character string that is in left-to-right-logical order, and then writes the character string in visual order.
	$LOGVSRw. Format (p. 99)	Processes a character string that is in right-to-left-logical order, and then writes the character string in visual order.
	$VSLOGw. Format (p. 230)	Processes a character string that is in visual order, and then writes the character string in left-to-right logical order.
	$VSLOGRw. Format (p. 232)	Processes a character string that is in visual order, and then writes the character string in right-to-left logical order.

Category	Language elements	Description
Character	$UCS2Bw. Format (p. 207)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in big-endian, 16-bit, UCS2, Unicode encoding.
	$UCS2BEw. Format (p. 208)	Processes a character string that is in big-endian, 16-bit, UCS2, Unicode encoding, and then writes the character string in the encoding of the current SAS session.
	$UCS2Lw. Format (p. 210)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in little-endian, 16-bit, UCS2, Unicode encoding.
	$UCS2LEw. Format (p. 211)	Processes a character string that is in little-endian, 16-bit, UCS2, Unicode encoding, and then writes the character string in the encoding of the current SAS session.
	$UCS2Xw. Format (p. 212)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in native-endian, 16-bit, UCS2, Unicode encoding.
	$UCS2XEw. Format (p. 213)	Processes a character string that is in native-endian, 16-bit, UCS2, Unicode encoding, and then writes the character string in the encoding of the current SAS session.
	$UCS4Bw. Format (p. 214)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in big-endian, 32-bit, UCS4, Unicode encoding.
	$UCS4BEw. Format (p. 216)	Processes a character string that is in big-endian, 32-bit, UCS4, Unicode encoding, and then writes the character string in the encoding of the current SAS session.
	$UCS4Lw. Format (p. 217)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in little-endian, 32-bit, UCS4, Unicode encoding.
	$UCS4LEw. Format (p. 218)	Processes a character string that is in little-endian, 32-bit, UCS4, Unicode encoding, and then writes the character string in the encoding of the current SAS session.
	$UCS4Xw. Format (p. 219)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in native-endian, 32-bit, UCS4, Unicode encoding.
	$UCS4XEw. Format (p. 221)	Processes a character string that is in native-endian, 32-bit, UCS4, Unicode encoding, and then writes the character string in the encoding of the current SAS session.
	$UESCw. Format (p. 222)	Processes a character string that is encoded in the current SAS session, and then writes the character string in Unicode escape (UESC) representation.
	$UESCEw. Format (p. 223)	Processes a character string that is in Unicode escape (UESC) representation, and then writes the character string in the encoding of the current SAS session.

Category	Language elements	Description
	$UNCRw. Format (p. 224)	Processes a character string that is encoded in the current SAS session, and then writes the character string in numeric character representation (NCR).
	$UNCREw. Format (p. 225)	Processes a character string that is in numeric character representation (NCR), and then writes the character string in the encoding of the current SAS session.
	$UPARENw. Format (p. 226)	Processes a character string that is encoded in the current SAS session, and then writes the character string in Unicode parenthesis (UPAREN) representation.
	$UPARENEw. Format (p. 227)	Processes a character string that is in Unicode parenthesis (UPAREN), and then writes the character string in the encoding of the current SAS session.
	$UTF8Xw. Format (p. 228)	Processes a character string that is in the encoding of the current SAS session, and then writes the character string in universal transformation format (UTF-8) encoding.
	$UTF8XEw. Format (p. 229)	Processes a character string that is in universal transformation format (UTF-8), and then writes the character string in the encoding of the current SAS session.
Date and Time	HDATEw. Format (p. 93)	Writes date values in the form yyyy mmmmm dd where dd is the day-of-the-month, mmmmm represents the month's name in Hebrew, and yyyy is the year.
	HEBDATEw. Format (p. 94)	Writes date values according to the Jewish calendar.
	MINGUOw. Format (p. 100)	Writes date values as Taiwanese dates in the form yyyymmdd.
	NENGOw. Format (p. 101)	Writes date values as Japanese dates in the form e.yymmdd.
	NLDATEw. Format (p. 104)	Converts a SAS date value to the date value of the specified locale, and then writes the date value as a date.
	NLDATEMDw. Format (p. 105)	Converts the SAS date value to the date value of the specified locale, and then writes the value as the name of the month and the day of the month.
	NLDATEMNw. Format (p. 106)	Converts a SAS date value to the date value of the specified locale, and then writes the value as the name of the month.
	NLDATEWw. Format (p. 107)	Converts a SAS date value to the date value of the specified locale, and then writes the value as the date and the day of the week.
	NLDATEWNw. Format (p. 108)	Converts the SAS date value to the date value of the specified locale, and then writes the date value as the day of the week.
	NLDATEYMw. Format (p. 109)	Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year and the name of the month.

Category	Language elements	Description
	NLDATEYQw. Format (p. 110)	Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year and the quarter.
	NLDATEYRw. Format (p. 111)	Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year.
	NLDATEYWw. Format (p. 112)	Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year and the week.
	NLDATMw. Format (p. 113)	Converts a SAS datetime value to the datetime value of the specified locale, and then writes the value as a datetime.
	NLDATMAPw. Format (p. 114)	Converts a SAS datetime value to the datetime value of the specified locale, and then writes the value as a datetime with a.m. or p.m.
	NLDATMDTw. Format (p. 115)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the name of the month, day of the month and year.
	NLDATMMDw. Format (p. 116)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the name of the month and the day of the month.
	NLDATMMNw. Format (p. 116)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the name of the month.
	NLDATMTMw. Format (p. 117)	Converts the time portion of a SAS datetime value to the time-of-day value of the specified locale, and then writes the value as a time of day.
	NLDATMTZw. Format (p. 118)	Converts the time portion of the SAS datetime of the locale to the time of day and time zone.
	NLDATMWw. Format (p. 119)	Converts SAS datetime values to the locale sensitive datetime string as the day of the week and the datetime.
	NLDATMWNw. Format (p. 120)	Converts a SAS datetime value to the datetime value of the specified locale, and then writes the value as the day of the week.
	NLDATMWZw. Format (p. 121)	Converts SAS date values of the specified locale to a day-of-week, datetime, and time zone value.
	NLDATMYMw. Format (p. 121)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year and the name of the month.
	NLDATMYQw. Format (p. 122)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year and the quarter of the year.
	NLDATMYRw. Format (p. 123)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year.

Category	Language elements	Description
	NLDATMYWw. Format (p. 124)	Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year and the name of the week.
	NLDATMZw. Format (p. 125)	Converts SAS datetime values to the locale-sensitive datetime string as time zone and datetime.
	NLTIMAPw. Format (p. 205)	Converts a SAS time value to the time value of a specified locale, and then writes the value as a time value with a.m. or p.m. NLTIMAP also converts SAS date-time values.
	NLTIMEw. Format (p. 206)	Converts a SAS time value to the time value of the specified locale, and then writes the value as a time value. NLTIME also converts SAS date-time values.
	WEEKUw. Format (p. 233)	Writes a week number in decimal format by using the U algorithm.
	WEEKVw. Format (p. 234)	Writes a week number in decimal format by using the V algorithm.
	WEEKWw. Format (p. 236)	Writes a week number in decimal format by using the W algorithm.
	YYWEEKUw. Format (p. 238)	Writes a week number in decimal format by using the U algorithm, excluding day-of-the-week information.
	YYWEEKVw. Format (p. 240)	Writes a week number in decimal format by using the V algorithm, excluding day-of-the-week information.
	YYWEEKWw. Format (p. 241)	Writes a week number in decimal format by using the W algorithm, excluding the day-of-week information.
DBCS	$KANJIw. Format (p. 96)	Adds shift-code data to DBCS data.
	$KANJIXw. Format (p. 96)	Removes shift-code data from DBCS data.
Hebrew text handling	$CPTDWw. Format (p. 87)	Processes a character string that is in Hebrew text, encoded in IBM-PC (cp862), and then writes the character string in Windows Hebrew encoding (cp 1255).
	$CPTWDw. Format (p. 88)	Processes a character string that is encoded in Windows (cp1255), and then writes the character string in Hebrew DOS (cp862) encoding.
Numeric	EUROw.d Format (p. 89)	Writes numeric values with a leading euro symbol (E), a comma that separates every three digits, and a period that separates the decimal fraction.
	EUROXw.d Format (p. 91)	Writes numeric values with a leading euro symbol (E), a period that separates every three digits, and a comma that separates the decimal fraction.
	NLBESTw. Format (p. 103)	Writes the best numerical notation based on the locale.

Category	Language elements	Description
	NLMNIAEDw.d Format (p. 126)	Writes the monetary format of the international expression for the United Arab Emirates.
	NLMNIAUDw.d Format (p. 126)	Writes the monetary format of the international expression for Australia.
	NLMNIBGNw.d Format (p. 127)	Writes the monetary format of the international expression for Bulgaria.
	NLMNIBRLw.d Format (p. 128)	Writes the monetary format of the international expression for Brazil.
	NLMNICADw.d Format (p. 129)	Writes the monetary format of the international expression for Canada.
	NLMNICHFw.d Format (p. 130)	Writes the monetary format of the international expression for Liechtenstein and Switzerland.
	NLMNICNYw.d Format (p. 131)	Writes the monetary format of the international expression for China.
	NLMNICZKw.d Format (p. 132)	Writes the monetary format of the international expression for the Czech Republic.
	NLMNIDKKw.d Format (p. 133)	Writes the monetary format of the international expression for Denmark, Faroe Island, and Greenland.
	NLMNIEEKw.d Format (p. 134)	Writes the monetary format of the international expression for Estonia.
	NLMNIEGPw.d Format (p. 134)	Writes the monetary format of the international expression for Egypt.
	NLMNIEURw.d Format (p. 135)	Writes the monetary format of the international expression for Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.
	NLMNIGBPw.d Format (p. 136)	Writes the monetary format of the international expression for the United Kingdom.
	NLMNIHKDw.d Format (p. 137)	Writes the monetary format of the international expression for Hong Kong.
	NLMNIHRKw.d Format (p. 138)	Writes the monetary format of the international expression for Croatia.
	NLMNIHUFw.d Format (p. 139)	Writes the monetary format of the international expression for Hungary.
	NLMNIIDRw.d Format (p. 140)	Writes the monetary format of the international expression for Indonesia.

Category	Language elements	Description
	NLMNIILSw.d Format (p. 141)	Writes the monetary format of the international expression for Israel.
	NLMNIINRw.d Format (p. 142)	Writes the monetary format of the international expression for India.
	NLMNIJPYw.d Format (p. 142)	Writes the monetary format of the international expression for Japan.
	NLMNIKRWw.d Format (p. 143)	Writes the monetary format of the international expression for South Korea.
	NLMNILTLw.d Format (p. 144)	Writes the monetary format of the international expression for Lithuania.
	NLMNILVLw.d Format (p. 145)	Writes the monetary format of the international expression for Latvia.
	NLMNIMOPw.d Format (p. 146)	Writes the monetary format of the international expression for Macau.
	NLMNIMXNw.d Format (p. 147)	Writes the monetary format of the international expression for Mexico.
	NLMNIMYRw.d Format (p. 148)	Writes the monetary format of the international expression for Malaysia.
	NLMNINOKw.d Format (p. 149)	Writes the monetary format of the international expression for Norway.
	NLMNINZDw.d Format (p. 150)	Writes the monetary format of the international expression for New Zealand.
	NLMNIPLNw.d Format (p. 150)	Writes the monetary format of the international expression for Poland.
	NLMNIRUBw.d Format (p. 151)	Writes the monetary format of the international expression for Russia.
	NLMNISEKw.d Format (p. 152)	Writes the monetary format of the international expression for Sweden.
	NLMNISGDw.d Format (p. 153)	Writes the monetary format of the international expression for Singapore.
	NLMNITHBw.d Format (p. 154)	Writes the monetary format of the international expression for Thailand.
	NLMNITRYw.d Format (p. 155)	Writes the monetary format of the international expression for Turkey.
	NLMNITWDw.d Format (p. 156)	Writes the monetary format of the international expression for Taiwan.

Category	Language elements	Description
	NLMNIUSDw.d Format (p. 157)	Writes the monetary format of the international expression for Puerto Rico and the United States.
	NLMNIZARw.d Format (p. 158)	Writes the monetary format of the international expression for South Africa.
	NLMNLAEDx.d Format (p. 158)	Writes the monetary format of the local expression for the United Arab Emirates.
	NLMNLAUDw.d Format (p. 159)	Writes the monetary format of the local expression for Australia.
	NLMNLBGNw.d Format (p. 160)	Writes the monetary format of the local expression for Bulgaria.
	NLMNLBRLw.d Format (p. 161)	Writes the monetary format of the local expression for Brazil.
	NLMNLCADw.d Format (p. 162)	Writes the monetary format of the local expression for Canada.
	NLMNLCHFw.d Format (p. 163)	Writes the monetary format of the local expression for Liechtenstein and Switzerland.
	NLMNLCNYw.d Format (p. 164)	Writes the monetary format of the local expression for China.
	NLMNLCZKw.d Format (p. 165)	Writes the monetary format of the local expression for the Czech Republic.
	NLMNLDKKw.d Format (p. 166)	Writes the monetary format of the local expression for Denmark, Faroe Island, and Greenland.
	NLMNLEEKw.d Format (p. 166)	Writes the monetary format of the local expression for Estonia.
	NLMNLEGPw.d Format (p. 167)	Writes the monetary format of the local expression for Egypt.
	NLMNLEURw.d Format (p. 168)	Writes the monetary format of the local expression for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.
	NLMNLGBPw.d Format (p. 169)	Writes the monetary format of the local expression for the United Kingdom.
	NLMNLHKDw.d Format (p. 170)	Writes the monetary format of the local expression for Hong Kong.
	NLMNLHRKw.d Format (p. 171)	Writes the monetary format of the local expression for Croatia.

Category	Language elements	Description
	NLMNLHUFw.d Format (p. 172)	Writes the monetary format of the local expression for Hungary.
	NLMNLIDRw.d Format (p. 173)	Writes the monetary format of the local expression for Indonesia.
	NLMNLILSw.d Format (p. 174)	Writes the monetary format of the local expression for Israel.
	NLMNLINRw.d Format (p. 174)	Writes the monetary format of the local expression for India.
	NLMNLJPYw.d Format (p. 175)	Writes the monetary format of the international expression for Japan.
	NLMNLKRWw.d Format (p. 176)	Writes the monetary format of the local expression for South Korea.
	NLMNLLTLw.d Format (p. 177)	Writes the monetary format of the local expression for Lithuania.
	NLMNLLVLw.d Format (p. 178)	Writes the monetary format of the local expression for Latvia.
	NLMNLMOPw.d Format (p. 179)	Writes the monetary format of the local expression for Macau.
	NLMNLMXNw.d Format (p. 180)	Writes the monetary format of the local expression for Mexico.
	NLMNLMYRw.d Format (p. 181)	Writes the monetary format of the local expression for Malaysia.
	NLMNLNOKw.d Format (p. 182)	Writes the monetary format of the local expression for Norway.
	NLMNLNZDw.d Format (p. 182)	Writes the monetary format of the local expression for New Zealand.
	NLMNLPLNw.d Format (p. 183)	Writes the monetary format of the local expression for Poland.
	NLMNLRUBw.d Format (p. 184)	Writes the monetary format of the local expression for Russia.
	NLMNLSEKw.d Format (p. 185)	Writes the monetary format of the local expression for Sweden.
	NLMNLSGDw.d Format (p. 186)	Writes the monetary format of the local expression for Singapore.
	NLMNLTHBw.d Format (p. 187)	Writes the monetary format of the local expression for Thailand.

Category	Language elements	Description
	NLMNLTRYw.d Format (p. 188)	Writes the monetary format of the local expression for Turkey.
	NLMNLTWDw.d Format (p. 189)	Writes the monetary format of the local expression for Taiwan.
	NLMNLUSDw.d Format (p. 190)	Writes the monetary format of the local expression for Puerto Rico and the United States.
	NLMNLZARw.d Format (p. 190)	Writes the monetary format of the local expression for South Africa.
	NLMNYw.d Format (p. 191)	Writes the monetary format of the local expression in the specified locale using local currency.
	NLMNYIw.d Format (p. 193)	Writes the monetary format of the international expression in the specified locale.
	NLNUMw.d Format (p. 194)	Writes the numeric format of the local expression in the specified locale.
	NLNUMIw.d Format (p. 195)	Writes the numeric format of the international expression in the specified locale.
	NLPCTw.d Format (p. 197)	Writes percentage data of the local expression in the specified locale.
	NLPCTIw.d Format (p. 198)	Writes percentage data of the international expression in the specified locale.
	NLPCTNw.d Format (p. 199)	Produces percentages, using a minus sign for negative values.
	NLPCTPw.d Format (p. 200)	Writes locale-specific numeric values as percentages.
	NLPVALUEw.d Format (p. 201)	Writes p-values of the local expression in the specified locale.
	NLSTRMONw.d Format (p. 202)	Writes the month name in the specified locale.
	NLSTRQTRw.d Format (p. 203)	Writes a numeric value as the quarter-of-the-year in the specified locale.
	NLSTRWKw.d Format (p. 204)	Writes a numeric value as the day-of-the-week in the specified locale.
	YENw.d Format (p. 237)	Writes numeric values with yen signs, commas, and decimal points.

Dictionary

$BIDI*w*. Format

Converts between a logically ordered string and a visually ordered string, by reversing the order of Hebrew and Arabic characters while preserving the order of Latin words and numbers.

Category: BIDI text handling

Alignment: left

Syntax

$BIDI*w*.

Syntax Description

w

specifies the width of the output field.

Default: 1 if *w* is not specified

Range: 1–32767

Details

In the Windows operating environment, Hebrew and Arabic text is stored in logical order. The text is stored in the order that it is written and not necessarily as it is displayed. However, in other operating environments, Hebrew text is stored in the same order it is displayed. SAS users can encounter Hebrew and Arabic text that is reversed. Such situations can occur when you use SAS/CONNECT or other software to transfer SAS data sets or reports with Hebrew and Arabic text from a visual operating environment to a logical one. The $BIDI format is a format that reverses Hebrew and Arabic text while maintaining the order of numbers and Latin-1 words.

Operating Environment Information

In mainframe operating environments, this format is designed to work with NewCode Hebrew and Arabic. Some mainframe operating environments might experience unsatisfactory results, because they use the OldCode Hebrew or Arabic encoding. There is a hotfix for this encoding on :**SAS Institute's Web site**.

Comparisons

The $BIDI*w*. format performs a reversing function similar to the $REVERJ*w*. format, which writes character data in reverse order and preserves blanks. $BIDI*w*. behaves in the following way:

- $BIDI*w*. reverses the order of words and numbers in a specified string, preserving blanks. Latin-1 words and numbers themselves are not reversed, only their order in the string.
- When $BIDI encounters a word consisting of Hebrew or Arabic characters in the text string, the characters in the Hebrew or Arabic word are reversed and the position of the Hebrew or Arabic word is reversed in the string.

Example

This example demonstrates how $BIDI*w.* reverses Hebrew characters. The Hebrew is reversed in the string. The Hebrew characters in the words are also reversed.

```
data;
   a='שלום כיתה א abc 123';
   b1 = put (a,$bidi20.);
   put b=;
   b2 = put (b,$bidi20.);
   put b=;
run;
```

The following lines are written to the SAS log:

```
b1=123 abc א כיתה שלום
b2=א הזיכ סולש abc 123
```

$CPTDW*w*. Format

Processes a character string that is in Hebrew text, encoded in IBM-PC (cp862), and then writes the character string in Windows Hebrew encoding (cp 1255).

Category: Hebrew text handling

Alignment: left

Syntax

$CPTDW*w*.

Syntax Description

w

specifies the width of the output field.

Default: 200

Range: 1–32767

Comparisons

The $CPTDW*w*. format performs processing that is the opposite of the $CPTWD*w*. format.

Example

The following example uses the input value of "808182x."

Statement	Result
	`----+----1----+`
`put text $cptdw3.;`	אבג

See Also

Format:

- "$CPTWDw. Format" on page 88

Informats:

- "$CPTDWw. Informat" on page 337
- "$CPTWDw. Informat" on page 338

$CPTWD*w*. Format

Processes a character string that is encoded in Windows (cp1255), and then writes the character string in Hebrew DOS (cp862) encoding.

Category: Hebrew text handling

Alignment: left

Syntax

$CPTWD*w*.

Syntax Description

w

specifies the width of the output field.

Default: 200

Range: 1–32767

Comparisons

The $CPTWD*w*. format performs processing that is the opposite of the $CPTDW*w*. format.

Example

The following example uses the input value of "ג'ון".

Statement	Result
	`----+----1----+----2----+`
`put text $cptwd3.;`	€□,

See Also

Format:

- "$CPTDWw. Format" on page 87

Informats:

- "$CPTDWw. Informat" on page 337
- "$CPTWDw. Informat" on page 338

EURO*w.d* Format

Writes numeric values with a leading euro symbol (E), a comma that separates every three digits, and a period that separates the decimal fraction.

Category: Numeric

Alignment: right

Syntax

EURO*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 1-32

Tip: If you want the euro symbol to be part of the output, be sure to choose an adequate width.

d

specifies the number of digits to the right of the decimal point in the numeric value.

Default: 0

Range: 0-31

Requirement: must be less than *w*

Comparisons

- The EURO*w.d* format is similar to the EUROX*w.d* format, but EUROX*w.d* format reverses the roles of the decimal point and the comma. This convention is common in European countries.
- The EURO*w.d* format is similar to the DOLLAR*w.d* format, except that DOLLAR*w.d* format writes a leading dollar sign instead of the euro symbol.

Example

These examples use 1254.71 as the value of amount.

Statements	Results
	`----+----1----+----2----+----3`
`put amount euro10.2;`	`E1,254.71`

Statements	Results
put amount euro5.;	1,255
put amount euro9.2;	E1,254.71
put amount euro15.3;	E1,254.710

```
data _null_;
   input x;
   put x euro10.2;
   put x euro5.;
   put x euro9.2;
   put x euro15.3;
   datalines;
1254.71
;
run;
SAS Log:
 E1,254.71
1,255
E1,254.71
     E1,254.710

   /* This code determines the default length. */
   data _null_;
      input x;
      put x euro.;
      datalines;
   1
   22
   333
   4444
   55555
   666666
   7777777
   88888888
   999999999
   1234561234
   ;run;
   SAS Log:
        datalines;
       E1
      E22
     E333
   E4,444
   55,555
   666666
   7.78E6
   8.89E7
      1E9
   1.23E9
   NOTE: At least one W.D format was too small for the number to be printed.
   The decimal may be shifted by the "BEST" format.
```

```
/* This code determines the range. */
data _null_;
   input x;
   put x euro5.;
   put x euro6.;
   put x euro7.;
   put x euro8.;
   put x euro9.;
   put x euro9.2;
   put x euro10.;
   put x euro10.2;
   put x euro10.4;
   put x euro11.;
   put x euro11.3;
   put x euro12.;
   put x euro12.2;
   put x euro13.;
   put x euro13.2;
   datalines;
333
4444
55555
666666
7777777
88888888
999999999
1234561234
;run;
```

See Also

Format:

- “EUROXw.d Format” on page 91

Informats:

- “EUROw.d Informat” on page 339
- “EUROXw.d Informat” on page 340

EUROX*w.d* Format

Writes numeric values with a leading euro symbol (E), a period that separates every three digits, and a comma that separates the decimal fraction.

Category: Numeric

Alignment: right

Syntax

EUROX*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 1-32

Tip: If you want the euro symbol to be part of the output, be sure to choose an adequate width.

d

specifies the number of digits to the right of the decimal point in the numeric value.

Default: 0

Range: 0-31

Requirement: must be less than *w*

Comparisons

- The EUROX*w.d* format is similar to the EURO*w.d* format, but EURO*w.d* format reverses the roles of the comma and the decimal point. This convention is common in English–speaking countries.
- The EUROX*w.d* format is similar to the DOLLARX*w.d* format, except that DOLLARX*w.d* format writes a leading dollar sign instead of the euro symbol.

Example

These examples use 1254.71 as the value of amount.

Statements	Results
	`----+----1----+----2----+----3`
`put amount eurox10.2;`	` E1.254,71`
`put amount eurox5.;`	`1.255`
`put amount eurox9.2;`	`E1.254,71`
`put amount eurox15.3;`	`     E1.254,710`

```
data _null_;
   input x;
   put x eurox10.2;
   put x eurox5.;
   put x eurox9.2;
   put x eurox15.3;
   datalines;
1254.71
; run;
SAS Log:
 E1.254,71
1.255
E1.254,71
     E1.254,710
```

```
/* This code determines the default length. */
data _null_;
   input x;
   put x eurox.;
   datalines;
1
22
333
4444
55555
666666
7777777
88888888
999999999
1234561234
;run;
SAS Log:
    E1
   E22
  E333
E4.444
55.555
666666
7.78E6
8.89E7
   1E9
1.23E9
```

Note: At least one W.D format was too small for the number to be printed. The decimal may be shifted by the "BEST" format.

See Also

Format:

- “EUROw.d Format” on page 89

Informats:

- “EUROw.d Informat” on page 339
- “EUROXw.d Informat” on page 340

HDATE*w*. Format

Writes date values in the form *yyyy mmmmm dd* where *dd* is the day-of-the-month, *mmmmm* represents the month's name in Hebrew, and *yyyy* is the year.

Category: Date and Time

Alignment: right

Syntax

HDATE*w*.

Syntax Description

w
specifies the width of the output field.

Note: Use widths 9, 11, 15, or 17 for the best view.

Default: 17

Range: 9–17

Details

The HDATE*w*. format writes the SAS date value in the form *yyyy mmmmm dd*:

yyyy
is the year

mmmmm
is the Hebrew name of the month

dd
is the day-of-the-month

Example

The following example uses the input value of 15780, which is the SAS date of March 16, 2003.

Statements	Results
	`----+----1----+----2----+`
`put day hdate9.;`	`03 אדר 16`
`put day hdate11.;`	`2003 אדר 16`
`put day hdate17.;`	`2003 אדר 16`

See Also

Format:

- “HEBDATEw. Format” on page 94

HEBDATE*w*. Format

Writes date values according to the Jewish calendar.

Category: Date and Time

Alignment: right

Syntax

HEBDATE*w*.

Syntax Description

w
specifies the width of the output field.

Default: 16

Range: 7–24

Details

The Jewish calendar is a combined solar and lunar calendar. Years are counted from the creation of the world, which according to Jewish history, occurred 3760 years and three months before the commencement of the Christiar. You must add 3761, beginning in the autumn of a specified year in the Gregorian calendar to calculate the Hebrew year.

The HEBDATE*w*. format writes the SAS date value according to the Jewish calendar. The date is written in one of the following formats:

long
ראשון י' אדר ה'תשס"ג

default
י' אדר תשס"ג

short
י'/ו'/תשס"ג

Example

The following example uses the input value of 15780, which is the SAS date of March 16, 2003.

Statements	Results
	----+----1----+
put day hebdate13.;	י"ב/ו'2/תשס"ג
put day hebdate16.;	י"ב אדר-ב' תשס"ג
put day hebdate24.;	ראשון י"ב אדר-ב' ה'תשס"ג

See Also

Informat:

- "HDATEw. Format" on page 93

$KANJI*w*. Format

Adds shift-code data to DBCS data.

Category: DBCS

Alignment: left

Syntax

$KANJI*w*.

Syntax Description

w

specifies the width of the output field.

Range: The minimum width of the format is *2 + (length of shift code used on the current DBCSTYPE= setting)*2*

Restriction: The width must be an even number. If it is an odd number, it is truncated. The width must be equal to or greater than the length of the shift-code data.

Details

The $KANJI format adds shift-code data to DBCS data that does not have shift-code data. If the input data is blank, shift-code data is not added.

The $KANJI format processes host-mainframe data, but $KANJI can be used on other platforms. If you use the $KANJI format on non-EBCDIC (non-modal encoding) hosts, the data does not change.

See Also

Formats:

- "$KANJIXw. Format" on page 96

Informat:

- "$KANJIw. Informat" on page 342
- "$KANJIXw. Informat" on page 343

System Option:

- "DBCSTYPE System Option: UNIX, Windows, and z/OS" on page 472

$KANJIX*w*. Format

Removes shift-code data from DBCS data.

Category: DBCS

Alignment: left

Syntax

$KANJIX*w*.

Syntax Description

w
specifies the width of the output field.

Range: The minimum width of the format is 2.

Restriction: The width must be an even number. If it is an odd number, it is truncated. The width must be equal to or greater than the length of the shift-code data.

Details

The $KANJIX format removes shift-code data from DBCS data. The input data length must be `2 + (SO/SI length)*2`. The data must start with SO and end with SI, unless single-byte data is returned.

The $KANJIX format processes host mainframe data, but $KANJIX can be used on other platforms. If you use the $KANJIX format on non-EBCDIC (non-modal encoding) hosts, the data does not change.

See Also

Format:

- "$KANJIw. Format" on page 96

Informats:

- "$KANJIw. Informat" on page 342
- "$KANJIXw. Informat" on page 343

System Option:

- "DBCSTYPE System Option: UNIX, Windows, and z/OS" on page 472

$LOGVS*w*. Format

Processes a character string that is in left-to-right-logical order, and then writes the character string in visual order.

Category: BIDI text handling

Alignment: left

Syntax

$LOGVS*w*.

Syntax Description

w
specifies the width of the output field.

Default: 200

Range: 1–32767

Details

The $LOGVS*w*. format is used when you store logical-ordered text on a visual server.

Note: If the $LOGVS*w*. format is not accessible, then the Hebrew or Arabic portion of the data will be reversed.

Comparisons

The $LOGVS*w*. format performs processing that is the opposite of the $LOGVSR*w*. format.

Example

The following example uses the Hebrew input value of " flight". טיסה

Statements	Results
	`----+----1----+----2----+`
`put text $logvs12.;`	טיסה **flight**

The following example uses the Arabic input value of " " computer. ذات

Statements	Results
	`----+----1----+----2----+`
`put text $logvs12.;`	ذات computer

See Also

Formats:

- "$LOGVSRw. Format" on page 99

Informats:

- "$LOGVSRw. Informat" on page 345
- "$LOGVSw. Informat" on page 344

$LOGVSR*w*. Format

Processes a character string that is in right-to-left-logical order, and then writes the character string in visual order.

Category: BIDI text handling

Alignment: left

Syntax

$LOGVSR*w*.

Syntax Description

w
specifies the width of the output field.
Default: 200
Range: 1–32767

Details

The $LOGVSR*w*. format is used when you store logical-ordered text on a visual server. The Hebrew or Arabic portion of the text is reversed if the $LOGVS*w*. format is not on the server.

Comparisons

The $LOGVSR*w*. format performs processing that is opposite of the $LOGVS*w*. format.

Example

The following example uses the Hebrew input value of "טיסה flight".

Statements	Results
	`----+----1----+`
`put text $logvsr12.;`	**flight** טיסה

The following example uses the Arabic input value of " ذات " computer.

Statements	Results
	`----+----1----+`
`put text $logvsr12.;`	ذات computer

See Also

Formats:

- "$LOGVSw. Format" on page 97

Informats:

- "$LOGVSw. Informat" on page 344
- "$LOGVSRw. Informat" on page 345

MINGUO*w*. Format

Writes date values as Taiwanese dates in the form *yyyymmdd*.

Category: Date and Time

Alignment: left

Syntax

MINGUO*w*.

Syntax Description

w
specifies the width of the output field.
Default: 8
Range: 1–10

Details

The MINGUO*w*. format writes SAS date values in the form *yyyymmdd*, where

yyyy
is an integer that represents the year.

mm
is an integer that represents the month.

dd
is an integer that represents the day of the month.

The Taiwanese calendar uses 1912 as the base year (01/01/01 is January 1, 1912). Dates before 1912 appear as a series of asterisks. Year values do not roll around after 100 years; instead, they continue to increase.

Example

The example table uses the following input values:

- 12054 is the SAS date value that corresponds to January 1, 1993.
- 18993 is the SAS date value that corresponds to January 1, 2012.

- -20088 is the SAS date value that corresponds to January 1, 1905.

Statements	Results
`x=put(12054,minguo7.);` `put x=;`	`x=820101`
`x=put(12054,minguo9.);` `put x=;`	`x=82/01/01`
`x=put(12054,minguo10.);` `put x=;`	`x=0082/01/01`
`x=put(18993,minguo7.);` `put x=;`	`x=1000101`
`x=put(18993,minguo9.);` `put x=;`	`x=100/01/01`
`x=put(18993,minguo10.);` `put x=;`	`x=0101/01/01`
`x=put(-20088,minguo7.);` `put x=;`	`**********`
`x=put(-20088,minguo9.);` `put x=;`	`**********`
`x=put(-20088,minguo10.);` `put x=;`	`**********`

See Also

Informat:

- “MINGUOw. Informat” on page 346

NENGO*w*. Format

Writes date values as Japanese dates in the form *e.yymmdd*.

Category: Date and Time

Alignment: left

Syntax

NENGO*w*.

Syntax Description

w
specifies the width of the output field.

Default: 10

Range: 2–10

Details

The NENGO*w*. format writes SAS date values in the form *e.yymmdd*, where

e
is the first letter of the name of the emperor (Meiji, Taisho, Showa, or Heisei).

yy
is an integer that represents the year.

mm
is an integer that represents the month.

dd
is an integer that represents the day of the month.

If the width is too small, SAS omits the period.

Example

The example table uses the input value of 15342, which is the SAS date value that corresponds to January 2, 2002.

```
data _null_;
   date=15342;
   put date nengo3.;
   put date nengo6.;
   put date nengo8.;
   put date nengo9.;
   put date nengo10.;
run
```

Statements	Results
	`----+----1`
`put date nengo3.;`	`H14`
`put date nengo6.;`	`H14/01`
`put date nengo8.;`	`H.140102`
`put date nengo9.;`	`H14/01/02`
`put date nengo10.;`	`H.14/01/02`

See Also

Informat:

- "NENGOw. Informat" on page 347

NLBESTw. Format

Writes the best numerical notation based on the locale.

Category: Numeric

Alignment: right

Syntax

NLBEST*w*.

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 1–32

Tip: If you print numbers between 0 and .01 exclusively, then use a field width of at least 7 to avoid excessive rounding. If you print numbers between 0 and -.01 exclusively, then use a field width of at least 8.

Details

The NLBEST format writes the best numerical value based on the locale's decimal point and the sign mark's location. NLBEST is similar to the BEST format. For more information, see the BEST format in the *SAS Formats and Informats: Reference*.

Example

The following code produces results based on the locale:

```
x=-1257000
 put x nlbest6.;
 put x nlbest3.;
 put "=====";
x=-0.1
 put x nlbest6.;
 put x nlbest3.;
 put "=====";
x=0.1
 put x nlbest6.;
 put x nlbest3.;
 put "=====";
x=1257000
 put x nlbest6.;
 put x nlbest3.;
```

Locales	Results
locale=English_UnitedStates	-126E4 *** ===== -0.1 -.1 ===== 0.1 0.1 ===== 1.26E6 1E6
locale=German_Germany	-126E4 *** ===== -0,1 -,1 ===== 0,1 0,1 ===== 1,26E6 1E6
locale=ar_BH	126E4- *** ===== 0.1- .1- ===== 0.1 0.1 ===== 1.26E6 1E6

NLDATE*w*. Format

Converts a SAS date value to the date value of the specified locale, and then writes the date value as a date.

Category: Date and Time

Alignment: left

Syntax

NLDATE*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the date to fit the format width.

Default: 20

Range: 10–200

Comparisons

NLDATE*w*. is similar to DATE*w*. and WORDDATE*w*. except that NLDATE*w*. is locale-specific.

Example

These examples use the input value of 15760, which is the SAS date value that corresponds to February 24, 2003.

Statements	Results
	`----+----1----+----2`
`options locale=English_UnitedStates;` `put day nldate.;`	`February 24, 2003`
`options locale=German_Germany;` `put day nldate.;`	`24. Februar 2003`

See Also

Formats:

- “NLDATEMNw. Format” on page 106
- “NLDATEWw. Format” on page 107
- “NLDATEWNw. Format” on page 108

NLDATEMD*w*. Format

Converts the SAS date value to the date value of the specified locale, and then writes the value as the name of the month and the day of the month.

Category: Date and Time

Alignment: left

Syntax

NLDATEMD*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 6-200

Example

This example uses the en_US locale option.

Statement	Result
`put 1 nldatemd.;`	`January 02`

See Also

Format:

- "NLDATEYMw. Format" on page 109

NLDATEMN*w*. Format

Converts a SAS date value to the date value of the specified locale, and then writes the value as the name of the month.

Category: Date and Time

Alignment: left

Syntax

NLDATEMN*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the name of the month to fit the format width.

Default: 10

Range: 4–200

Comparisons

NLDATEMN*w*. is similar to MONNAME*w*. except that NLDATEMN*w*. is locale-specific.

Example

These examples use the input value of 15760, which is the SAS date value that corresponds to February 24, 2003.

Statements	Results
	`----+----1`
`options locale=English_UnitedStates;` `put month nldatemn.;`	`February`
`options locale=German_Germany;` `put month nldatemn.;`	`Februar`

See Also

Formats:

- "NLDATEw. Format" on page 104
- "NLDATEWw. Format" on page 107
- "NLDATEWNw. Format" on page 108

NLDATEW*w*. Format

Converts a SAS date value to the date value of the specified locale, and then writes the value as the date and the day of the week.

Category: Date and Time

Alignment: left

Syntax

NLDATEW*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the date and the day of the week to fit the format width.

Default: 20

Range: 10–200

Comparisons

NLDATEW*w*. is similar to WEEKDATE*w*. except that NLDATEW*w*. is locale specific.

Example

These examples use the input value of 15760, which is the SAS date value that corresponds to February 24, 2003.

Statements	Results
	`----+----1----+----2`

`options locale=English_UnitedStates;`
`date=15760;`
`x=put(date,nldatew.);`
`y=put(date,nldatew20.);`
`z=put(date,nldatew200.);`
`run;`
	`Mon, Feb 24, 03`
	`Mon, Feb 24, 03`
	`Monday, February 24, 2003`

`options locale=German_Germany;`
`date=15760;`
`x=put(date,nldatew.);`
`y=put(date,nldatew20.);`
`z=put(date,nldatew200.);`
`run;`
	`Mo, 24. Feb 03`
	`Mo, 24. Feb 03`
	`Montag, 24. Februar 2003`

See Also

Formats:

- “NLDATEw. Format” on page 104
- “NLDATEMNw. Format” on page 106
- “NLDATEWNw. Format” on page 108

NLDATEWN*w*. Format

Converts the SAS date value to the date value of the specified locale, and then writes the date value as the day of the week.

Category: Date and Time

Alignment: left

Syntax

NLDATEWN*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the day of the week to fit the format width.

Default: 10

Range: 4–200

Comparisons

NLDATEWN*w*. is similar to DOWNAME*w*. except that NLDATEWN*w*. is locale-specific.

Example

These examples use the input value of 15760, which is the SAS date value that corresponds to February 24, 2003.

Statements	Results
	`----+----1`
`options locale=English_UnitedStates;` `put date nldatewn.;`	`Monday`
`options locale=German_Germany;` `put date nldatewn.;`	`Montag`

See Also

Formats:

- “NLDATEw. Format” on page 104
- “NLDATEMNw. Format” on page 106
- “NLDATEWw. Format” on page 107

NLDATEYM*w*. Format

Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year and the name of the month.

Category: Date and Time

Alignment: left

Syntax

NLDATEYM*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 6–200

Example

This example uses the spanish_Spain locale option.

Statement	Result

`options locale=spanihs_Spain;`
`data_null;`
`dy=today();`
`x=put(dy, nldateym.);`
`y=put(dy, nldateym12.);`
`z=put(dy, nldateym200.);`
`run;`
	`agosto de 2010`
	`ago de 10`
	`agosto de 2010`

See Also

Format:

- “NLDATEMDw. Format” on page 105

NLDATEYQ*w*. Format

Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year and the quarter.

Category: Date and Time

Alignment: left

Syntax

NLDATEYQ*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 4–200

Example

This example uses the fr_FR locale option.

Statements	Results

options locale=fr_FR;
data _null_;
dy=today();
dt=datetime();
put "+--- NLDATEYQ min=4 default=16 max=200 ---+";
put ' 16' +5 dy nldateyq.;
put ' 4' +5 dy nldateyq4.;
put ' 14' +5 dy nldateyq14.;
put ' 32' +5 dy nldateyq32.;
put '200' +5 dy nldateyq200.;
run;
	+--- NLDATEYQ min=4 default=16 max=200 ---+
	16 T3 08
	4 ****
	14 T3 08
	32 3e trimestre 2008
	200
	3e trimestre 2008

NLDATEYR*w*. Format

Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year.

Category: Date and Time

Alignment: left

Syntax

NLDATEYR*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 2–200

Example

This example uses the fr_FR locale option.

Statements	Results

options locale=fr_FR;
data _null_;
dy=today();
dt=datetime();
put "+--- NLDATEYR min=2 default=16 max=200 ---+";
put dy nldateyr.;
put dy nldateyr2.;
put dy nldateyr8.;
put dy nldateyr200.;
run;
	+--- NLDATEYR min=2 default=16 max=200 ---+
	2008
	08
	2008
	2008

NLDATEYW*w*. Format

Converts the SAS date value to the date value of the specified locale, and then writes the date value as the year and the week.

Category: Date and Time

Alignment: left

Syntax

NLDATEYW*w*.

Syntax Description

w
specifies the width of the output field.
Default: 16
Range: 5–200

Example

This example uses the fr_FR locale option.

Statements	Results

options locale=fr_FR;
data _null_;
dy=today();
dt=datetime();
put "+--- NLDATEYW min=5 default=16 max=200 ---+";
put ' 16' +5 dy nldateyw.;
put ' 5' +5 dy nldateyw5.;
put ' 8' +5 dy nldateyw8.;
put ' 32' +5 dy nldateyw32.;
put '200' +5 dy nldateyw200.;
run;
	16 Week 33 2008
	5 *****
	8 W33 08
	32 Week 33 2008
	200
	Week 33 2008

NLDATM*w*. Format

Converts a SAS datetime value to the datetime value of the specified locale, and then writes the value as a datetime.

Category: Date and Time

Alignment: left

Syntax

NLDATM*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the datetime value to fit the format width.

Default: 30

Range: 10–200

Comparisons

The NLDATM*w*. format is similar to the DATETIME*w*. format except that the NLDATM*w*. format is locale-specific.

Example

These examples use the input value of 1361709583, which is the SAS datetime value that corresponds to 12:39:43 p.m. on February 24, 2003.

Statements	Results
	----+----1----+----2----+----3
options locale=English_UnitedStates; put day nldatm.;	24Feb03:12:39:43
options locale=German_Germany; put day nldatm.;	24. Februar 2003 12.39 Uhr

See Also

Formats:

- “NLDATMAPw. Format” on page 114
- “NLDATMTMw. Format” on page 117
- “NLDATMWw. Format” on page 119

NLDATMAP*w*. Format

Converts a SAS datetime value to the datetime value of the specified locale, and then writes the value as a datetime with a.m. or p.m.

Category: Date and Time

Alignment: left

Syntax

NLDATMAP*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the date-time value to fit the format width.

Default: 32

Range: 16–200

Comparisons

The NLDATMAP*w*. format is similar to DATEAMPM*w*. except that the NLDATMAP*w*. format is locale-specific.

Example

These examples use the input value of 1361709583, which is the SAS date-time value that corresponds to 12:39:43 p.m. on February 24, 2003.

Statements	Results
	----+----1----+----2----+----3
options locale=English_UnitedStates; put event nldatmap.;	February 24, 2003 12:39:43 PM
options locale=Spanish_Mexico; put event nldatmap.;	24 de febrero de 2003 12:39:43 PM

See Also

Formats:

- “NLDATMw. Format” on page 113
- “NLDATMTMw. Format” on page 117
- “NLDATMWw. Format” on page 119

NLDATMDT*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the name of the month, day of the month and year.

Category: Date and Time

Alignment: left

Syntax

NLDATMDT*w*.

Syntax Description

w

specifies the width of the output field

Default: 20

Range: 10-200

Example

This example uses the en_US locale option.

Statements	Results
put 86400,nldatmdt.; put 86400,dtdate.;	January 02, 1960 02JAN60

See Also

Formats:

- "NLDATMMDw. Format" on page 116

NLDATMMD*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the name of the month and the day of the month.

Category: Date and Time

Alignment: left

Syntax

NLDATMMD*w*.

Syntax Description

w
specifies the width of the output field.
Default: 16
Range: 6–200

Example

This example uses the en_US locale option.

Statement	Result
`put 86400 nldatmmd.;`	`January 02`

See Also

Format:

- "NLDATMYMw. Format" on page 121

NLDATMMN*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the name of the month.

Category: Date and Time

Alignment: left

Syntax

NLDATMMN*w*.

Syntax Description

w
specifies the width of the output field.
Default: 10
Range: 4–200

Example

This example uses the en_US locale option.

Statements	Results

data _null_;
dt = datetime();
dy = date();
put "+--- NLDATEMN min=4 default=10 max=200 ---+";
put dt nldatmmn.;
put dt nldatmmn4.;
put dt nldatmmn10.;
put dt nldatmmn200.;
run;
	+--- NLDATMMN min=4 default=10 max=200 ---+
	October
	Oct
	October
	October

NLDATMTM*w*. Format

Converts the time portion of a SAS datetime value to the time-of-day value of the specified locale, and then writes the value as a time of day.

Category: Date and Time
Alignment: left

Syntax

NLDATMTM*w*.

Syntax Description

w
specifies the width of the output field.
Default: 16
Range: 16–200

Comparisons

The NLDATMTM*w*. format is similar to the TOD*w*. format except that the NLDATMTM*w*. format is locale-specific.

Example

These examples use the input value of 1361709583, which is the SAS datetime value that corresponds to 12:39:43 p.m. on February 24, 2003.

Statements	Results
	`----+----1`
`options locale=English_UnitedStates;` `put event nldatmtm.;`	`12:39:43`
`options locale=German_Germany;` `put event nldatmtm.;`	`12.39 Uhr`

See Also

Formats:

- “NLDATMw. Format” on page 113
- “NLDATMAPw. Format” on page 114
- “NLDATMWw. Format” on page 119

NLDATMTZ*w*. Format

Converts the time portion of the SAS datetime of the locale to the time of day and time zone.

Category: Date and Time

Alignment: left

Syntax

NLDATMTZ*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the day of week and datetime to fit the format width.

Default: 32

Range: 16–200

Example

This example uses the current datetime value.

Statements	Result

`options locale=fr_FR;`
`data test;`
`x=datetime();`
`put x=nldatmtz.;`
`run;`
	`x=10 h 40 -0400`

NLDATMW*w*. Format

Converts SAS datetime values to the locale sensitive datetime string as the day of the week and the datetime.

Category: Date and Time

Alignment: left

Syntax

NLDATMW*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the day of week and datetime to fit the format width.

Default: 30

Range: 16–200

Comparisons

The NLDATMW*w*. format is similar to the TWMDY*w*. format except that the NLDATMW*w*. format is locale-specific.

Example

These examples use the input value of 1361709583, which is the SAS datetime value that corresponds to 12:39:43 p.m. on February 24, 2003.

Statements	Results
	`----+----1----+----2----+----3`

Statements	Results

options locale=English_UnitedStates;
data null;
x=put(1361709583,nldatmw.);
y=put(1361709583,nldatmw30.);
z=put(1361709583,nldatmw200.);
run;
	Mon, Feb 24, 2003 12:39:43 PM
	Mon, Feb 24, 2003 12:39:43 PM
	Monday, February 24, 2003 12:39:43 PM

options locale=german_germany;
data null;
x=put(1361709583,nldatmw.);
y=put(1361709583,nldatmw30.);
z=put(1361709583,nldatmw200.);
run;
	Mo, 24. Feb 2003 12.39 Uhr
	Mo, 24. Feb 2003 12.39 Uhr
	Montag, 24. Februar 2003 12.39 Uhr

See Also

Formats:

- “NLDATMw. Format” on page 113
- “NLDATMAPw. Format” on page 114
- “NLDATMTMw. Format” on page 117

NLDATMWN*w*. Format

Converts a SAS datetime value to the datetime value of the specified locale, and then writes the value as the day of the week.

Category: Date and Time

Alignment: left

Syntax

NLDATMWN*w*.

Syntax Description

w

specifies the width of the output field.

Default: 30

Range: 16–200

Example

This example writes the SAS datetime value as a day of the week.

```
now = datetime() ;
put now nldatmwn. ;
```

NLDATMWZ*w*. Format

Converts SAS date values of the specified locale to a day-of-week, datetime, and time zone value.

Category: Date and Time

Alignment: left

Syntax

NLDATMWZ*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the day of week and datetime to fit the format width.

Default: 40

Range: 16–200

Example

This example uses the current datetime value.

Statements	Result

`options locale=fr_FR;`
`data test;`
`x=datetime();`
`put x=nldatmwz.;`
`run;`
	`x=vendredi 18 mars 2011 10 h 40 -0400`

NLDATMYM*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year and the name of the month.

Category: Date and Time

Alignment: left

Syntax

NLDATMYM*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 6–200

Example

This example uses the en_US locale option.

Statement	Result
`options locale=en_US;`	`January 1960`
`data_null;`	`January 1960`
`x=put(86400,nldatmym.);`	
`y=put(86400,nldatmym12.);`	
`put x=;`	
`put y=;`	
`run;`	

See Also

Format:

- "NLDATMMDw. Format" on page 116

NLDATMYQ*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year and the quarter of the year.

Category: Date and Time

Alignment: left

Syntax

NLDATMYQ*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 4–200

Example

This example uses the fr_FR locale option.

Statements	Results

options locale=fr_FR;
data _null_;
dy=today();
dt=datetime();
put "+--- NLDATMYQ min=4 default=16 max=200 ---+";
put ' 16' +5 dt nldatmyq.;
put ' 4' +5 dt nldatmyq4.;
put ' 14' +5 dt nldatmyq14.;
put ' 32' +5 dt nldatmyq32.;
put '200' +5 dt nldatmyq200.;
run;
	+--- NLDATMYQ min=4 default=16 max=200 ---+
	16 T3 08
	4 ****
	14 T3 08
	32 3e trimestre 2008
	200 3e trimestre 2008

NLDATMYR*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year.

Category: Date and Time

Alignment: left

Syntax

NLDATMYR*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 2–200

Example

This example uses the en_US locale option.

Statements	Results

options locale=fr_FR;
data _null_;
dy=today();
dt=datetime();
put "+--- NLDATMYR min=2 default=16 max=200 ---+";
put dt nldatmyr.;
put dt nldatmyr2.;
put dt nldatmyr32.;
put dt nldatmyr200.;
run;
	+--- NLDATMYR min=2 default=16 max=200 ---+
	2008
	08
	2008
	2008

NLDATMYW*w*. Format

Converts the SAS datetime value to the datetime value of the specified locale, and then writes the value as the year and the name of the week.

Category: Date and Time

Alignment: left

Syntax

NLDATMYW*w*.

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 5–200

Example

This example uses the fr_FR locale option.

Statements	Results

options locale=fr_FR;
data _null_;
dy=today();
dt=datetime();
put "+--- NLDATMYW min=5 default=16 max=200 ---+";
put ' 16' +5 dt nldatmyw.;
put ' 5' +5 dt nldatmyw5.;
put ' 8' +5 dt nldatmyw8.;
put ' 32' +5 dt nldatmyw32.;
put '200' +5 dt nldatmyw200.;
run;
	+--- NLDATMYW min=5 default=16 max=200 ---+
	16 Week 33 2008
	5 *****
	8 W33 08
	32 Week 33 2008
	200
	Week 33 2008

NLDATMZ*w*. Format

Converts SAS datetime values to the locale-sensitive datetime string as time zone and datetime.

Category: Date and Time

Alignment: left

Syntax

NLDATMZ*w*.

Syntax Description

w

specifies the width of the output field. If necessary, SAS abbreviates the day of week and datetime to fit the format width.

Default: 40

Range: 16–200

Example

This example uses the current datetime value.

Statements	Result

`options locale=fr_FR;`
`data test;`
`x=datetime();`
`put x=nldatmz.;`
`run;`
	`x=18 mars 2011 10 h 40 -0400`

NLMNIAED*w.d* Format

Writes the monetary format of the international expression for the United Arab Emirates.

Category: Numeric

Alignment: left

Syntax

NLMNIAED*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 3

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniaed32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(AED1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLAEDx.d Format" on page 158

NLMNIAUD*w.d* Format

Writes the monetary format of the international expression for Australia.

Category: Numeric

Alignment: left

Syntax

NLMNIAUD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniaud32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(AUD1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLAUDw.d Format" on page 159

NLMNIBGN*w.d* Format

Writes the monetary format of the international expression for Bulgaria.

Category: Numeric

Alignment: left

Syntax

NLMNIBGN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnibgn32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(BGN1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLBGNw.d Format" on page 160

NLMNIBRL*w.d* Format

Writes the monetary format of the international expression for Brazil.

Category: Numeric

Alignment: left

Syntax

NLMNIBRL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnibrl32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(BRL1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLBRLw.d Format" on page 161

NLMNICAD*w.d* Format

Writes the monetary format of the international expression for Canada.

Category: Numeric

Alignment: left

Syntax

NLMNICAD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnicad32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(CAD1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLCADw.d Format" on page 162

NLMNICHF*w.d* Format

Writes the monetary format of the international expression for Liechtenstein and Switzerland.

Category: Numeric

Alignment: left

Syntax

NLMNICHF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnichf32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(CHF1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLCHFw.d Format" on page 163

NLMNICNY*w.d* Format

Writes the monetary format of the international expression for China.

Category: Numeric

Alignment: left

Syntax

NLMNICNY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 02

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnicny32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`(CNY1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLCNYw.d Format" on page 164

NLMNICZK*w.d* Format

Writes the monetary format of the international expression for the Czech Republic.

Category: Numeric

Alignment: left

Syntax

NLMNICZK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniczk32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(CZK1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLCZKw.d Format" on page 165

NLMNIDKK*w.d* Format

Writes the monetary format of the international expression for Denmark, Faroe Island, and Greenland.

Category: Numeric

Alignment: left

Syntax

NLMNIDKK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnidkk32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(DKK1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLDKKw.d Format" on page 166

NLMNIEEK*w.d* Format

Writes the monetary format of the international expression for Estonia.

Category: Numeric

Alignment: left

Syntax

NLMNIEEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnieek32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(EEK1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNLEEKw.d Format” on page 166

NLMNIEGP*w.d* Format

Writes the monetary format of the international expression for Egypt.

Category: Numeric

Alignment: left

Syntax

NLMNIEGP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 3

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniegp32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(EGP1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLEGPw.d Format" on page 167

NLMNIEUR*w.d* Format

Writes the monetary format of the international expression for Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.

Category: Numeric

Alignment: left

Syntax

NLMNIEUR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to Locale=German_Germany.

```
x=put(-1234.56789,nlmnieur32.2);
y=put(-1234.56789,nlmnleur32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-1.234,57EUR`
`put y=;`	-1.234,57€

See Also

Format:

- "NLMNLEURw.d Format" on page 168

NLMNIGBP*w.d* Format

Writes the monetary format of the international expression for the United Kingdom.

Category: Numeric

Alignment: left

Syntax

NLMNIGBP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnigbp32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(GBP1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLGBPw.d Format" on page 169

NLMNIHKD*w.d* Format

Writes the monetary format of the international expression for Hong Kong.

Category: Numeric

Alignment: left

Syntax

NLMNIHKD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnihkd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(HKD1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLHKDw.d Format" on page 170

NLMNIHRK*w.d* Format

Writes the monetary format of the international expression for Croatia.

Category: Numeric

Alignment: left

Syntax

NLMNIHRK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnihrk32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(HRK1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLHRKw.d Format" on page 171

NLMNIHUF*w.d* Format

Writes the monetary format of the international expression for Hungary.

Category: Numeric

Alignment: left

Syntax

NLMNIHUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnihuf32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`(HUF1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLHUFw.d Format" on page 172

NLMNIIDR*w.d* Format

Writes the monetary format of the international expression for Indonesia.

Category: Numeric

Alignment: left

Syntax

NLMNIIDR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniidr32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(IDR1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLIDRw.d Format" on page 173

NLMNIILS*w.d* Format

Writes the monetary format of the international expression for Israel.

Category: Numeric

Alignment: left

Syntax

NLMNIILS*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniils32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(ILS1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLILSw.d Format" on page 174

NLMNIINR*w.d* Format

Writes the monetary format of the international expression for India.

Category: Numeric

Alignment: left

Syntax

NLMNIINR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniinr32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(INR1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNLINRw.d Format” on page 174

NLMNIJPY*w.d* Format

Writes the monetary format of the international expression for Japan.

Category: Numeric

Alignment: left

Syntax

NLMNIJPY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnijpy32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(JPY1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLJPYw.d Format" on page 175

NLMNIKRW*w.d* Format

Writes the monetary format of the international expression for South Korea.

Category: Numeric

Alignment: left

Syntax

NLMNIKRW*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnikrw32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(KRW1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLKRWw.d Format" on page 176

NLMNILTL*w.d* Format

Writes the monetary format of the international expression for Lithuania.

Category: Numeric

Alignment: left

Syntax

NLMNILTL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniltl32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(LTL1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLLTLw.d Format" on page 177

NLMNILVL*w.d* Format

Writes the monetary format of the international expression for Latvia.

Category: Numeric

Alignment: left

Syntax

NLMNILVL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnilvl32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(LVL1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLLVLw.d Format" on page 178

NLMNIMOP*w.d* Format

Writes the monetary format of the international expression for Macau.

Category: Numeric

Alignment: left

Syntax

NLMNIMOP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnimop32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(MOP1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLMOPw.d Format" on page 179

NLMNIMXN*w.d* Format

Writes the monetary format of the international expression for Mexico.

Category: Numeric

Alignment: left

Syntax

NLMNIMXN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnimxn32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`(MXN1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLMXNw.d Format" on page 180

NLMNIMYR*w.d* Format

Writes the monetary format of the international expression for Malaysia.

Category: Numeric

Alignment: left

Syntax

NLMNIMYR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnimyr32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(MYR1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNLMYRw.d Format” on page 181

NLMNINOK*w.d* Format

Writes the monetary format of the international expression for Norway.

Category: Numeric

Alignment: left

Syntax

NLMNINOK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmninok32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(NOK1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNLNOKw.d Format” on page 182

NLMNINZD*w.d* Format

Writes the monetary format of the international expression for New Zealand.

Category: Numeric

Alignment: left

Syntax

NLMNINZD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmninzd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(NZD1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNLNZDw.d Format” on page 182

NLMNIPLN*w.d* Format

Writes the monetary format of the international expression for Poland.

Category: Numeric

Alignment: left

Syntax

NLMNIPLN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnipln32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(PLN1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLPLNw.d Format" on page 183

NLMNIRUB*w.d* Format

Writes the monetary format of the international expression for Russia.

Category: Numeric

Alignment: left

Syntax

NLMNIRUB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnirub32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(RUB1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLRUBw.d Format" on page 184

NLMNISEK*w.d* Format

Writes the monetary format of the international expression for Sweden.

Category: Numeric

Alignment: left

Syntax

NLMNISEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnisek32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(SEK1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLSEKw.d Format" on page 185

NLMNISGD*w.d* Format

Writes the monetary format of the international expression for Singapore.

Category: Numeric

Alignment: left

Syntax

NLMNISGD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnisgd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(SGD1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLSGDw.d Format" on page 186

NLMNITHB*w.d* Format

Writes the monetary format of the international expression for Thailand.

Category: Numeric

Alignment: left

Syntax

NLMNITHB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnithb32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(THB1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLTHBw.d Format" on page 187

NLMNITRY*w.d* Format

Writes the monetary format of the international expression for Turkey.

Category: Numeric

Alignment: left

Syntax

NLMNITRY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnitry32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
put x=;	(TRY1,234.57)
put y=;	$-1,234.57

See Also

Format:

- “NLMNLTRYw.d Format” on page 188

NLMNITWD*w.d* Format

Writes the monetary format of the international expression for Taiwan.

Category: Numeric

Alignment: left

Syntax

NLMNITWD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnitwd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(TWD1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNLTWDw.d Format" on page 189

NLMNIUSD*w.d* Format

Writes the monetary format of the international expression for Puerto Rico and the United States.

Category: Numeric

Alignment: left

Syntax

NLMNIUSD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 912

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmniusd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(USD1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLUSDw.d Format" on page 190

NLMNIZAR*w.d* Format

Writes the monetary format of the international expression for South Africa.

Category: Numeric

Alignment: left

Syntax

NLMNIZAR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnizar32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(ZAR1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNLZARw.d Format" on page 190

NLMNLAED*x.d* Format

Writes the monetary format of the local expression for the United Arab Emirates.

Category: Numeric

Alignment: left

Syntax

NLMNLAED*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 3

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlaed32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(AED1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIAEDw.d Format" on page 126

NLMNLAUD*w.d* Format

Writes the monetary format of the local expression for Australia.

Category: Numeric

Alignment: left

Syntax

NLMNLAUD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlaud32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(AU$1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIAUDw.d Format" on page 126

NLMNLBGN*w.d* Format

Writes the monetary format of the local expression for Bulgaria.

Category: Numeric

Alignment: left

Syntax

NLMNLBGN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlbgn32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(BGN1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIBGNw.d Format" on page 127

NLMNLBRL*w.d* Format

Writes the monetary format of the local expression for Brazil.

Category: Numeric

Alignment: left

Syntax

NLMNLBRL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlbrl32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(R$1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIBRLw.d Format" on page 128

NLMNLCAD*w.d* Format

Writes the monetary format of the local expression for Canada.

Category: Numeric

Alignment: left

Syntax

NLMNLCAD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlcad32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(CA$1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNICADw.d Format" on page 129

NLMNLCHF*w.d* Format

Writes the monetary format of the local expression for Liechtenstein and Switzerland.

Category: Numeric

Alignment: left

Syntax

NLMNLCHF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlchf32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`SFr.1,234.57`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNICHFw.d Format" on page 130

NLMNLCNY*w.d* Format

Writes the monetary format of the local expression for China.

Category: Numeric

Alignment: left

Syntax

NLMNLCNY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlcny32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(RMB1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNICNYw.d Format" on page 131

NLMNLCZK*w.d* Format

Writes the monetary format of the local expression for the Czech Republic.

Category: Numeric

Alignment: left

Syntax

NLMNLCZK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlczk32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(CZK1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNICZKw.d Format" on page 132

NLMNLDKK*w.d* Format

Writes the monetary format of the local expression for Denmark, Faroe Island, and Greenland.

Category: Numeric

Alignment: left

Syntax

NLMNLDKK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnldkk32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(kr1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNIDKKw.d Format” on page 133

NLMNLEEK*w.d* Format

Writes the monetary format of the local expression for Estonia.

Category: Numeric

Alignment: left

Syntax

NLMNLEEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnleek32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(Kr1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIEEKw.d Format" on page 134

NLMNLEGP*w.d* Format

Writes the monetary format of the local expression for Egypt.

Category: Numeric

Alignment: left

Syntax

NLMNLEGP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 3

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlegp32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(EGP1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIEGPw.d Format" on page 134

NLMNLEUR*w.d* Format

Writes the monetary format of the local expression for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.

Category: Numeric

Alignment: left

Syntax

NLMNLEUR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to German_Germany.

```
x=put(-1234.56789,nlmnieur32.2);
y=put(-1234.56789,nlmnleur32.2);
```

Statements	Results
	----+----1----+----2----+
`put x=;`	-1.234,57EUR
`put y=;`	€-1.234,57

See Also

Format:

- "NLMNIEURw.d Format" on page 135

NLMNLGBP*w.d* Format

Writes the monetary format of the local expression for the United Kingdom.

Category: Numeric

Alignment: left

Syntax

NLMNLGBP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlgbp32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(£1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIGBPw.d Format" on page 136

NLMNLHKD*w.d* Format

Writes the monetary format of the local expression for Hong Kong.

Category: Numeric

Alignment: left

Syntax

NLMNLHKD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlhkd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(HK$1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNIHKDw.d Format" on page 137

NLMNLHRK*w.d* Format

Writes the monetary format of the local expression for Croatia.

Category: Numeric

Alignment: left

Syntax

NLMNLHRK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlhrk32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`(Kn1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIHRKw.d Format" on page 138

NLMNLHUF*w.d* Format

Writes the monetary format of the local expression for Hungary.

Category: Numeric

Alignment: left

Syntax

NLMNLHUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlhuf32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(Ft1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIHUFw.d Format" on page 139

NLMNLIDR*w.d* Format

Writes the monetary format of the local expression for Indonesia.

Category: Numeric

Alignment: left

Syntax

NLMNLIDR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlidr32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(Rp1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIIDRw.d Format" on page 140

NLMNLILS*w.d* Format

Writes the monetary format of the local expression for Israel.

Category: Numeric

Alignment: left

Syntax

NLMNLILS*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlils32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(ILS1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNIILSw.d Format” on page 141

NLMNLINR*w.d* Format

Writes the monetary format of the local expression for India.

Category: Numeric

Alignment: left

Syntax

NLMNLINR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlinr32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(INR1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIINRw.d Format" on page 142

NLMNLJPY*w.d* Format

Writes the monetary format of the international expression for Japan.

Category: Numeric

Alignment: left

Syntax

NLMNLJPY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnljpy32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(JPY1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIJPYw.d Format" on page 142

NLMNLKRW*w.d* Format

Writes the monetary format of the local expression for South Korea.

Category: Numeric

Alignment: left

Syntax

NLMNLKRW*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlkrw32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(KRW1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIKRWw.d Format" on page 143

NLMNLLTL*w.d* Format

Writes the monetary format of the local expression for Lithuania.

Category: Numeric

Alignment: left

Syntax

NLMNLLTL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlltl32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(LT1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNILTLw.d Format" on page 144

NLMNLLVL*w.d* Format

Writes the monetary format of the local expression for Latvia.

Category: Numeric

Alignment: left

Syntax

NLMNLLVL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnllvl32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(Ls1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNILVLw.d Format" on page 145

NLMNLMOP*w.d* Format

Writes the monetary format of the local expression for Macau.

Category: Numeric

Alignment: left

Syntax

NLMNLMOP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlmop32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`(P1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIMOPw.d Format" on page 146

NLMNLMXN*w.d* Format

Writes the monetary format of the local expression for Mexico.

Category: Numeric

Alignment: left

Syntax

NLMNLMXN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlmxn32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(MX$1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIMXNw.d Format" on page 147

NLMNLMYR*w.d* Format

Writes the monetary format of the local expression for Malaysia.

Category: Numeric

Alignment: left

Syntax

NLMNLMYR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlmyr32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(R1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIMYRw.d Format" on page 148

NLMNLNOK*w.d* Format

Writes the monetary format of the local expression for Norway.

Category: Numeric

Alignment: left

Syntax

NLMNLNOK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlnok32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(kr1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNINOKw.d Format” on page 149

NLMNLNZD*w.d* Format

Writes the monetary format of the local expression for New Zealand.

Category: Numeric

Alignment: left

Syntax

NLMNLNZD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlnzd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(NZ$1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNINZDw.d Format" on page 150

NLMNLPLN*w.d* Format

Writes the monetary format of the local expression for Poland.

Category: Numeric

Alignment: left

Syntax

NLMNLPLN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlpln32.2);
y=put(-1234.56789,dollar32.2)
```

Statements	Results
	`----+----1----+`
`put x=;`	`(PLN1,234.57`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNIPLNw.d Format” on page 150

NLMNLRUB*w.d* Format

Writes the monetary format of the local expression for Russia.

Category: Numeric

Alignment: left

Syntax

NLMNLRUB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlrub32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(RUB1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIRUBw.d Format" on page 151

NLMNLSEK*w.d* Format

Writes the monetary format of the local expression for Sweden.

Category: Numeric

Alignment: left

Syntax

NLMNLSEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlsek32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(kr1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNISEKw.d Format" on page 152

NLMNLSGD*w.d* Format

Writes the monetary format of the local expression for Singapore.

Category: Numeric

Alignment: left

Syntax

NLMNLSGD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlsgd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(SG$1,234.57)
put y=;	$-1,234.57

See Also

Format:

- "NLMNISGDw.d Format" on page 153

NLMNLTHB*w.d* Format

Writes the monetary format of the local expression for Thailand.

Category: Numeric

Alignment: left

Syntax

NLMNLTHB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlthb32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`(THB1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNITHBw.d Format" on page 154

NLMNLTRY*w.d* Format

Writes the monetary format of the local expression for Turkey.

Category: Numeric

Alignment: left

Syntax

NLMNLTRY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 4

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnltry32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(YTL1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNITRYw.d Format" on page 155

NLMNLTWD*w.d* Format

Writes the monetary format of the local expression for Taiwan.

Category: Numeric

Alignment: left

Syntax

NLMNLTWD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnltwd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(NT$1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNITWDw.d Format" on page 156

NLMNLUSD*w.d* Format

Writes the monetary format of the local expression for Puerto Rico and the United States.

Category: Numeric

Alignment: left

Syntax

NLMNLUSD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlusd32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(US$1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIUSDw.d Format" on page 157

NLMNLZAR*w.d* Format

Writes the monetary format of the local expression for South Africa.

Category: Numeric

Alignment: left

Syntax

NLMNLZAR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 12

Range: 8–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 2

Range: 0–28

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnlzar32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`(R1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- "NLMNIZARw.d Format" on page 158

NLMNY*w.d* Format

Writes the monetary format of the local expression in the specified locale using local currency.

Category: Numeric

Alignment: left

Syntax

NLMNY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies the number of digits to the right of the decimal point in the numeric value.

Default: 0

Range: 0–31

Details

The NLMNY*w.d* format reads integer binary (fixed-point) values, including negative values that are represented in two's-complement notation. The NLMNY*w.d* format writes numeric values by using the currency symbol, the thousands separator, and the decimal separator that is used by the locale.

Note: The NLMNY*w.d* format does not convert currency format, therefore, the value of the formatted number should equal the currency of the current locale value.

Comparisons

The NLMNY*w.d* and NLMNYI*w.d* formats write the monetary format with locale-dependent thousands and decimal separators. However, the NLMNYI*w.d* format uses three-letter international currency codes, such as USD, while NLMNY*w.d* format uses local currency symbols, such as $.

The NLMNY*w.d* format is similar to the DOLLAR*w.d* format except that the NLMNY*w.d* format is locale-specific.

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmny32.2);
y=put(-1234.56789,dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`($1,234.57)`
`put y=;`	`$-1,234.57`

See Also

Format:

- “NLMNYIw.d Format” on page 193

Informats:

- “NLMNYw.d Informat” on page 416

- "NLMNYIw.d Informat" on page 417

NLMNYI*w.d* Format

Writes the monetary format of the international expression in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLMNYI*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies the number of digits to the right of the decimal point in the numeric value.

Default: 0

Range: 0–31

Details

The NLMNYI*w.d* format reads integer binary (fixed-point) values, including negative values that are represented in two's-complement notation. The NLMNYI*w.d* format writes numeric values by using the international currency code, and locale-dependent thousands and decimal separators. The position of international currency code is also locale dependent.

Note: The NLMNYI*w.d* format does not convert currency format, therefore, the value of the formatted number should equal the currency of the current locale value.

Comparisons

The NLMNY*w.d* and NLMNYI*w.d* formats write the monetary format with locale-dependent thousands and decimal separators. However, the NLMNYI*w.d* format uses three-letter international currency codes, such as USD, while NLMNY*w.d* format uses local currency symbols, such as $.

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-1234.56789,nlmnyi32.2);
y=put(-1234.56789,nlmny32.2);
z=put(-1234.56789,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	(USD1,234.57)
put y=;	($1,234.57)
put z=;	$-1,234.57

See Also

Format:

- “NLMNYw.d Format” on page 191

Informats:

- “NLMNYw.d Informat” on page 416
- “NLMNYIw.d Informat” on page 417

NLNUM*w.d* Format

Writes the numeric format of the local expression in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLNUM*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLMUM*w.d* format reads integer binary (fixed-point) values, including negative values that are represented in two's-complement notation. The NLNUM*w.d* format writes numeric values by using the thousands separator and the decimal separator that is used by the locale.

Comparisons

The NLNUM*w.d* format writes the numeric value with locale-dependent thousand and decimal separators. The NLNUMI*w.d* format writes the numeric value with a comma (,) as thousand separator and a period (.) as a decimal separator.

If the *w* or *d* values are not large enough to generate a formatted number, the NLNUM*w.d* format uses an algorithm that prints the thousands-separator characters whenever possible, even if some decimal precision is lost.

Example

```
x=put(-1234356.7891,nlnum32.2);
```

Statements	Results
	`----+----1----+`
`options LOCALE=English_UnitedStates;` `put x=;`	`-1,234,356.79`
`options LOCALE=German_Germany;` `put x=;`	`-1.234.356,79`

See Also

Format:

- “NLNUMIw.d Format” on page 195

Informats:

- “NLNUMw.d Informat” on page 419
- “NLNUMIw.d Informat” on page 420

NLNUMI*w.d* Format

Writes the numeric format of the international expression in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLNUMI*w.d*

Syntax Description

w
specifies the width of the output field.

Default: 6

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLNUMI*w.d* format reads integer binary (fixed-point) values, including negative values that are represented in two's-complement notation. The NLNUMI*w.d* format writes numeric values by using a comma (,) as thousands separator and a period (.) as a decimal separator for all locales.

Comparisons

The NLNUMI*w.d* format writes the numeric data of the international expression in the specified locale. The NLNUMI*w.d* format writes the numeric value with a comma (,) as thousand separator and a period (.) as a decimal separator.

If the *w* or *d* values are not large enough to generate a formatted number, the NLNUM*w.d* format uses an algorithm that prints the thousands-separator characters whenever possible, even if some decimal precision is lost.

Example

```
x=put(-1234356.7891,nlnumi32.2);
```

Statements	Results
	`----+----1----+`
`options LOCALE=English_UnitedStates;` `put x=;`	`-1,234,356.79`
`options LOCALE=German_Germany;` `put x=;`	`-1,234,356.79`

See Also

Format:

- “NLNUMw.d Format” on page 194

Informats:

- “NLNUMw.d Informat” on page 419
- “NLNUMIw.d Informat” on page 420

NLPCT*w.d* Format

Writes percentage data of the local expression in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLPCT*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 4–32

d

specifies to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Comparisons

The NLPCT*w.d* format writes percentage data of the local expression in the specified locale. The NLPCT*w.d* format writes the percentage value with locale-dependent thousand and decimal separators. The NLPCTI*w.d* format writes the percentage value with a comma (,) as thousand separator and a period (.) as a decimal separator.

The NLPCT*w.d* format is similar to the PERCENT*w.d* format except the NLPCT*w.d* format is locale-specific.

Example

```
x=put(-12.3456789,nlpct32.2);
y=put(-12.3456789,nlpcti32.2);
z=put(-12.3456789,percent32.2);
```

Statements	Results
	`----+-----------1`
`options LOCALE=English_UnitedStates;`	`-1,234.57%`
`put x=;`	`-1,234.57%`
`put y=;`	`(                    1234.57%)`
`put z=;`	

Statements	Results
options LOCALE=German_Germany;	-1.234,57%
put x=;	-1,234.57%
put y=;	(1234.57%)
put z=;	

See Also

Format:

- “NLPCTIw.d Format” on page 198

Informats:

- “NLPCTw.d Informat” on page 421
- “NLPCTIw.d Informat” on page 422

NLPCTI*w.d* Format

Writes percentage data of the international expression in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLPCTI*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 4–32

d

specifies to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Comparisons

The NLPCTI*w.d* format writes percentage data of the international expression in the specified locale. The NLPCT*w.d* format writes the percentage value with locale-dependent thousand and decimal separators. The NLPCTI*w.d* format writes the percentage value with a comma (,) as thousand separator and a period (.) as a decimal separator.

The NLPCT*w.d* format is similar to the PERCENT*w.d* format except the NLPCT*w.d* format is locale-specific.

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put(-12.3456789,nlpcti32.2);
y=put(-12.3456789,percent32.2);
```

Statements	Results
	`----+--------1`
`put x=;`	`-1,234.57%`
`put y=;`	`(                    1234.57)`

See Also

Format:

- “NLPCTw.d Format” on page 197

Informats:

- “NLPCTw.d Informat” on page 421
- “NLPCTIw.d Informat” on page 422

NLPCTN*w.d* Format

Produces percentages, using a minus sign for negative values.

Category: Numeric

Alignment: right

Syntax

NLPCTN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 4–32

Tip: The width of the output field must account for the minus sign (–), the percent sign (%), and a trailing blank, whether the number is negative or positive.

d

specifies the number of digits to the right of the decimal point in the numeric value. This argument is optional.

Range: 0–31

Requirement: must be less than *w*

Details

The NLPCTN*w.d* format multiplies negative values by 100, adds a minus sign to the beginning of the value, and adds a percent sign (%) to the end of the formatted value.

Example

```
x=-0.02;
```

Statements	Results
put x nlpctn6.;	x=-2%
put x percentn6.;	x=-2%

NLPCTP*w.d* Format

Writes locale-specific numeric values as percentages.

Category: Numeric

Alignment: right

Syntax

NLPCTP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 4–32

Tip: The width of the output field must account for the percent sign (%).

d

specifies the number of digits to the right of the decimal point in the numeric value. This argument is optional. The thousand separator and decimal symbol for the NLPCTP format is locale-specific.

Range: 0–31

Requirement: must be less than *w*

Details

The NLPCTP*w.d* format multiplies values by 100, formats them, and adds a percent sign (%) to the end of the formatted value. The NLPCTP*w.d* format is similar to the The PERCENT*w.d* format except that the thousand separator and decimal symbol for the NLPCTP*w.d* format is locale-specific.

Example

```
x=-0.02;
```

Statements	Results
put x nlpctp6.;	–2%
put x percent6.;	(2%)

NLPVALUE*w.d* Format

Writes p-values of the local expression in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLPVALUE*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

Range: 3–32

d

specifies to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 4

Range: 1–30

Example

This example uses the german_Germany locale option.

Statements:

```
options locale=german_germany;
data _null_;
   put "+--- nlpvalue min=3 default=6 max=32 ---+";
   x=0.1248;
   put x= +5 x pvalue.    +5 x nlpvalue.;
   put x= +5 x pvalue3.1  +5 x nlpvalue3.1;
   put x= +5 x pvalue20.2 +5 x nlpvalue20.2;
   put x= +5 x pvalue32.3 +5 x nlpvalue32.3;
run;
```

Results:

```
+--- nlpvalue min=3 default=6 max=32 ---+
x=0.1248   0.1248     0,1248
x=0.1248   0.1     0,1
x=0.1248                  0.12                     0,12
x=0.1248                              0.125                            0,125
```

See Also

Format:

- "PVALUEw.d Format" in *SAS Formats and Informats: Reference*

NLSTRMON*w.d* Format

Writes the month name in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLSTRMON*w.d*

Syntax Description

w

specifies the width of the output field

Default: 20

Range: 200-1

d

specifies the following:

- 00000001: write abbreviated form.
- 00000010: write capitalized form.

Default: 0

Range: 0-3

Details

The NLSTRMONw.d format writes a SAS value, 1–12 as the name-of-the-month in the specified locale. The following examples use the English_UnitedStates locale.

- 1 = the first month (January)
- 2 = the second month (February)
- 3 = the third month (March)
- 4 = the fourth month (April)
- 5 = the fifth month (May)

- 6 = the sixth month (June)
- 7 = the seventh month (July)
- 8 = the eight month (August)
- 9 = the ninth month (September)
- 10 = the tenth month (October)
- 11 = the eleventh month (November)
- 12 = the twelfth month (December)

Example

This example uses the English_UnitedStates session encoding.

Statements	Results
Data _null_ ; monnum = 1 ; /* January=1, December=12 */ put monnum NLSTRMON20. ; put monnum NLSTRMON20.1; /* decimal .1 specified use abbreviation. */ put monnum NLSTRMON20.2; put monnum NLSTRMON20.3; run;	January Jan JANUARY JAN

NLSTRQTR*w.d* Format

Writes a numeric value as the quarter-of-the-year in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLSTRQTR*w.d*

Syntax Description

w

specifies the width of the output field

Default: 20

Range: 1–200

d

specifies the following:

- 00000001: write abbreviated form.
- 00000010: write capitalized form.

Default: 3

Range: 0–3

Details

The NLSTRQTRw.d format writes a SAS value, 1–4 as the name-of-the-quarter for the year in the specified locale. The following examples use the English_UnitedStates locale.

- 1 = 1st quarter
- 2 = 2nd quarter
- 3 = 3rd quarter
- 4 = 4th quarter

Example

This example uses the English_UnitedStates session encoding.

Statements	Results
Data _null_ ; qtrnum = 1 ; /* January=1, December=12 */ put qtrnum NLSTRQTR20. ; put qtrnum NLSTRQTR20.1; /* decimal .1 specified use abbreviation. */ put qtrnum NLSTRQTR20.2; put qtrnum NLSTRQTR20.3; run;	1st quarter 1st quarter 1ST QUARTER 1ST QUARTER

NLSTRWK*w.d* Format

Writes a numeric value as the day-of-the-week in the specified locale.

Category: Numeric

Alignment: left

Syntax

NLSTRWK*w.d*

Syntax Description

w

specifies the width of the output field

Default: 20

Range: 1–200

d

specifies the following:

- 00000001: write abbreviated form.
- 00000010: write capitalized form.

Default: 0

Range: 0–3

Details

The NLSTRQTRw.d format writes a SAS value, 1–7 as the name-of-the-week in the specified locale. The following examples use the English_UnitedStates locale.

- 1 = First day-of-week (Monday)
- 2 = Second day-of-week (Tuesday)
- 3 = Third day-of-week (Wednesday)
- 4 = Fourth day-of-week (Thursday)
- 5 = Fifth day-of-week (Friday)
- 6 = Sixth day-of-week (Saturday)
- 7 = Seventh day-of-week (Sunday)

Example

This example uses the English_UnitedStates session encoding.

Statements	Results
Data _null_ ; wknum = 1 ; /* Sunday=1, Saturday=7 */ put wknum NLSTRWK20. ; put wknum NLSTRWK20.1; /* decimal .1 specified use abbreviation. */ put wknum NLSTRWK20.2; put wknum NLSTRWK20.3; run;	Sunday Sun SUNDAY SUN

NLTIMAP*w*. Format

Converts a SAS time value to the time value of a specified locale, and then writes the value as a time value with a.m. or p.m. NLTIMAP also converts SAS date-time values.

Category: Date and Time

Alignment: left

Syntax

NLTIMAP*w*.

Syntax Description

w

specifies the width of the output field.

Default: 10

Range: 4–200

Comparisons

The NLTIMAP*w*. format is similar to the TIMEAMPM*w*. format except that the NLTIMAP*w*. format is locale-specific.

Example

These examples use the input value of 59083, which is the SAS date-time value that corresponds to 4:24:43 p.m.

Statements	Results
	`----+----1----+`
`options locale=English_UnitedStates;` `put time nltimap.;`	`4:24:43 PM`
`options locale=German_Germany;` `put time nltimap.;`	`16.24 Uhr`

See Also

Format:

- "NLTIMEw. Format" on page 206

NLTIME*w*. Format

Converts a SAS time value to the time value of the specified locale, and then writes the value as a time value. NLTIME also converts SAS date-time values.

Category: Date and Time

Alignment: left

Syntax

NLTIME*w*.

Syntax Description

w

specifies the width of the input field.

Default: 20

Range: 10–200

Comparisons

The NLTIME*w*. format is similar to the TIME*w*. format except that the NLTIME*w*. format is locale-specific.

Example

These examples use the input value of 59083, which is the SAS date-time value that corresponds to 4:24:43 p.m.

Statements	Results
	`----+----1----+`
`options locale=English_UnitedStates;` `put time nltime.;`	`4:24:43`
`options locale=German_Germany;` `put time nltime.;`	`16.24`

See Also

Format:

- "NLTIMAPw. Format" on page 205

$UCS2B*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in big-endian, 16-bit, UCS2, Unicode encoding.

Category: Character

Alignment: left

Syntax

$UCS2B*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 2–32767

Details

The $UCS2B*w*. format writes a character string in big-endian, 16-bit, UCS2 (universal character set code in two octets), Unicode encoding. It processes character strings that are in the encoding of the current SAS session.

Comparisons

The $UCS2B*w*. format performs processing that is the opposite of the $UCS2BE*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Results
	`----+----1`

`data_null;`
`x='木';`
`y=put(x,$ucs2b2.);`
`put y $hex.;`
`run;`
	`5927`

See Also

Formats:

- “$UCS2Lw. Format” on page 210
- “$UCS2Xw. Format” on page 212
- “$UTF8Xw. Format” on page 228
- “$UCS2BEw. Format” on page 208

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2BEw. Informat” on page 428
- “$UCS2Lw. Informat” on page 429
- “$UCS2Xw. Informat” on page 431
- “$UTF8Xw. Informat” on page 445

$UCS2BE*w*. Format

Processes a character string that is in big-endian, 16-bit, UCS2, Unicode encoding, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UCS2BE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Details

The $UCS2BE*w*. format writes a character string in the encoding of the current SAS session. It processes character strings that are in big-endian, 16-bit, UCS2 (universal character set code in two octets), Unicode encoding.

Comparisons

The $UCS2BE*w*. format performs processing that is the opposite of the $UCS2B*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Results
	`----+----1`
`x ='592700410042'x;` `put x $ucs2be.;`	大**AB**

See Also

Formats:

- “$UCS2Bw. Format” on page 207

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2BEw. Informat” on page 428

$UCS2L*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in little-endian, 16-bit, UCS2, Unicode encoding.

Category: Character

Alignment: left

Syntax

$UCS2L*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 2–32767

Details

The $UCS2L*w*. format writes a character string in little-endian, 16-bit, UCS2 (universal character set code in two octets), Unicode encoding. It processes character strings that are in the encoding of the current SAS session.

Comparisons

The $UCS2L*w*. format performs processing that is the opposite of the $UCS2LE*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`

`data_null;`
`x ='大';`
`y=put(x,$ucs2l2.);`
`put y $hex.;`
`run;`
	`2759`

See Also

Formats:

- "$UCS2Bw. Format" on page 207
- "$UCS2LEw. Format" on page 211
- "$UCS2Xw. Format" on page 212
- "$UTF8Xw. Format" on page 228

Informats:

- "$UCS2Bw. Informat" on page 427
- "$UCS2Lw. Informat" on page 429
- "$UCS2LEw. Informat" on page 430
- "$UCS2Xw. Informat" on page 431
- "$UTF8Xw. Informat" on page 445

$UCS2LE*w*. Format

Processes a character string that is in little-endian, 16-bit, UCS2, Unicode encoding, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UCS2LE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Details

The $UCS2LE*w*. format writes a character string in the encoding of the current SAS session. It processes character strings that are in little-endian, 16-bit, UCS2 (universal character set code in two octets), Unicode encoding.

Comparisons

The $UCS2LE*w*. format performs processing that is the opposite of the $UCS2L*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`
`x ='275941004200'x;` `put x $ucs2le.;`	夫**AB**

See Also

Format:

- "$UCS2Lw. Format" on page 210

Informats:

- "$UCS2Lw. Informat" on page 429
- "$UCS2LEw. Informat" on page 430

$UCS2X*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in native-endian, 16-bit, UCS2, Unicode encoding.

Category: Character

Alignment: left

Syntax

$UCS2X*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 2–32767

Details

The $UCS2X*w*. format writes a character string in 16-bit, UCS2 (universal character set code in two octets), Unicode encoding, by using byte order that is native to the operating environment.

Comparisons

The $UCS2X*w*. format performs processing that is the opposite of the $UCS2XE*w*. format. If you are exchanging data within the same operating environment, use the $UCS2X*w*. format. If you are exchanging data with a different operating environment, use the $UCS2B*w*. format or $UCS2L*w*. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`
`x ='大';` `put x $ucs2x2.;`	`'5927'x (binary) or '2759'x (little endian)`

See Also

Formats:

- “$UCS2Bw. Format” on page 207
- “$UCS2XEw. Format” on page 213
- “$UCS2Lw. Format” on page 210
- “$UTF8Xw. Format” on page 228

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2Lw. Informat” on page 429
- “$UCS2Xw. Informat” on page 431
- “$UCS2XEw. Informat” on page 432
- “$UTF8Xw. Informat” on page 445

$UCS2XE*w*. Format

Processes a character string that is in native-endian, 16-bit, UCS2, Unicode encoding, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UCS2XE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Details

The $UCS2XE*w*. format writes a character string in the encoding of the current SAS session. It processes character strings that are in native-endian, 16-bit, UCS2 (universal character set code in two octets), Unicode encoding.

Comparisons

The $UCS2XE*w*. format performs processing that is the opposite of the $UCS2X*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`
`x ='e5a4a7'x; /* Japanese '大 ' in UTF8 */;` `put x $utf8xe10.;`	大

See Also

Format:

- “$UCS2Xw. Format” on page 212

Informats:

- “$UCS2Xw. Informat” on page 431
- “$UCS2XEw. Informat” on page 432

$UCS4B*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in big-endian, 32-bit, UCS4, Unicode encoding.

Category: Character

Alignment: left

Syntax

$UCS4B*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 4

Range: 4–32767

Details

The $UCS4B*w*. format writes a character string in big-endian, 32-bit, UCS4 (universal character set code in four octets), Unicode encoding. It processes character strings that are in the encoding of the current SAS session.

Comparisons

The $UCS4B*w*. format performs processing that is the opposite of the $UCS4BE*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`
`x ='木';` `put x $ucs4b4.;`	`'00005927'x (binary)`

See Also

Formats:

- “$UCS2Lw. Format” on page 210
- “$UCS2Xw. Format” on page 212
- “$UCS4BEw. Format” on page 216
- “$UCS4Lw. Format” on page 217
- “$UCS4Xw. Format” on page 219
- “$UTF8Xw. Format” on page 228

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2Lw. Informat” on page 429

- "$UCS2Xw. Informat" on page 431
- "$UCS4Bw. Informat" on page 433
- "$UCS4Lw. Informat" on page 434
- "$UCS4Xw. Informat" on page 435
- "$UTF8Xw. Informat" on page 445

$UCS4BE*w*. Format

Processes a character string that is in big-endian, 32-bit, UCS4, Unicode encoding, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UCS4BE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Details

The $UCS4BE*w*. format writes a character string in the encoding of the current SAS session. It processes character strings that are in big-endian, 32-bit, UCS4 (universal character set code in four octets), Unicode encoding.

Comparisons

The $UCS4BE*w*. format performs processing that is the opposite of the $UCS4B*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`
`x ='00005927000000410000042'x;` `put x $ucs4be.;`	大**AB**

See Also

Format:

- "$UCS4Bw. Format" on page 214

Informat:

- "$UCS4Bw. Informat" on page 433

$UCS4L*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in little-endian, 32-bit, UCS4, Unicode encoding.

Category: Character

Alignment: left

Syntax

$UCS4L*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 4

Range: 4–32767

Details

The $UCS4L*w*. format writes a character string in little-endian, 32-bit, UCS4 (universal character set code in four octets), Unicode encoding. It processes character strings that are in the encoding of the current SAS session.

Comparisons

The $UCS4L*w*. format performs processing that is the opposite of the $UCS4LE*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`

Statements	Result
data_null; **x = '大';** y=put(x,$ucs4l4.); put y $hex.; run;	2759

See Also

Formats:

- “$UCS2Bw. Format” on page 207
- “$UCS2Xw. Format” on page 212
- “$UCS4Bw. Format” on page 214
- “$UCS4LEw. Format” on page 218
- “$UCS4Xw. Format” on page 219
- “$UTF8Xw. Format” on page 228

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2Lw. Informat” on page 429
- “$UCS2Xw. Informat” on page 431
- “$UCS4Bw. Informat” on page 433
- “$UCS4Lw. Informat” on page 434
- “$UCS4Xw. Informat” on page 435
- “$UTF8Xw. Informat” on page 445

$UCS4LE*w*. Format

Processes a character string that is in little-endian, 32-bit, UCS4, Unicode encoding, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UCS4LE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Details

The $UCS4LE*w*. format writes a character string in the encoding of the current SAS session. It processes character strings that are in little-endian, 32-bit, UCS4 (universal character set code in four octets), Unicode encoding.

Comparisons

The $UCS4LE*w*. format performs processing that is the opposite of the $UCS4L*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`
`x ='27590000410000042000000'x;` `put x $ucs4le.;`	大**AB**

See Also

Format:

- “$UCS4Lw. Format” on page 217

Informat:

- “$UCS4Lw. Informat” on page 434

$UCS4X*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in native-endian, 32-bit, UCS4, Unicode encoding.

Category: Character

Alignment: left

Syntax

$UCS4X*w*.

Syntax Description

w
specifies the width of the output field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 4

Range: 4–32767

Details

The $UCS4X*w*. format writes a character string in 32-bit, UCS4 (universal character set code in two octets), Unicode encoding, by using byte order that is native to the operating environment.

Comparisons

The $UCS4X*w*. format performs processing that is the opposite of the $UCS4XE*w*. format. If you are exchanging data within the same operating environment, use the $UCS4X*w*. format. If you are exchanging data with a different operating environment, use the $UCS4B*w*. format or $UCS4L*w*. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating environment.

Statements	Results
	`----+----1`
`x = '大';` `put x $ucs4x4.;`	`'00005927'x (binary) or '27590000'x (little endian)`

See Also

Formats:

- “$UCS2Lw. Format” on page 210
- “$UCS4XEw. Format” on page 221
- “$UCS2Xw. Format” on page 212
- “$UCS4Bw. Format” on page 214
- “$UCS4Lw. Format” on page 217
- “$UTF8Xw. Format” on page 228

Informats:

- “$UCS2Bw. Informat” on page 427

- "$UCS2Lw. Informat" on page 429
- "$UCS2Xw. Informat" on page 431
- "$UCS4Bw. Informat" on page 433
- "$UCS4Bw. Format" on page 214
- "$UCS4Lw. Informat" on page 434
- "$UCS4Xw. Informat" on page 435
- "$UTF8Xw. Informat" on page 445

$UCS4XE*w*. Format

Processes a character string that is in native-endian, 32-bit, UCS4, Unicode encoding, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UCS4XE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Details

The $UCS4XE*w*. format writes a character string in the encoding of the current SAS session. It processes character strings that are in native-endian, 32-bit, UCS4 (universal character set code in four octets), Unicode encoding.

Comparisons

The $UCS4XE*w*. format performs processing that is the opposite of the $UCS4X*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1`

Statements	Result
`x ='27590000410000042000000'x;` `put x $ucs4be4.;`	丈**AB (little endian)**

See Also

Format:

- "$UCS4Xw. Format" on page 219

Informat:

- "$UCS4Xw. Informat" on page 435

$UESC*w*. Format

Processes a character string that is encoded in the current SAS session, and then writes the character string in Unicode escape (UESC) representation.

Category: Character

Alignment: left

Syntax

$UESC*w*.

Syntax Description

w

specifies the width of the input field.

Default: 8

Range: 1–32000

Details

If the characters are not available on all operating environments, for example, 0–9, a–z, A–Z, they must be represented in UESC. $UESC*w*. can be nested.

Comparisons

The $UESC*w*. format performs processing that is opposite of the $UESCE*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results
	----+----1----+----2
x='大' ; y='u5927' z='uu5927'; put x = $uesc10. ; put y = $uesc10. ; put z = $uesc10. ;	¥u5927 ¥uu5927 ¥uuu5927

See Also

Formats:

- "$UESCEw. Format" on page 223

Informats:

- "$UESCw. Informat" on page 437
- "$UESCEw. Informat" on page 438

$UESCE*w*. Format

Processes a character string that is in Unicode escape (UESC) representation, and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UESCE*w*.

Syntax Description

w

specifies the width of the output field.

Default: 8

Range: 1–32000

Details

If the data is not supported by the encoding of the current SAS session, the data remains in UESC.

Comparisons

The $UESCE*w*. format performs processing that is the opposite of the $UESC*w*. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+----2`

`x=put('¥u5927',$uesce10.) ;`
`x=put('¥uu5927',$uesce10.) ;`
`x=put('¥uuu5927',$uesce10.) ;`
	x= 
	`x=¥u5927`
	`x=¥uu5927`

See Also

Format:

- "$UESCw. Format" on page 222

Informats:

- "$UESCw. Informat" on page 437
- "$UESCEw. Informat" on page 438

$UNCR*w*. Format

Processes a character string that is encoded in the current SAS session, and then writes the character string in numeric character representation (NCR).

Category: Character

Alignment: left

Syntax

$UNCR*w*.

Syntax Description

w

specifies the width of the output field.

Default: 8

Range: 1–32000

Comparisons

The $UNCR*w*. format performs processing that is the opposite of the $UNCRE*w*. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+----2`

`x='91E5'x ; /* Japanese '大' in Shift-JIS */`
`y='abc';`
`put x $uncr10.;`
`put y $uncr10.;`
	`&#22823`
	`abc`

See Also

Formats:

- "$UNCREw. Format" on page 225

Informats:

- "$UNCRw. Informat" on page 439
- "$UNCREw. Informat" on page 440

$UNCRE*w*. Format

Processes a character string that is in numeric character representation (NCR), and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UNCRE*w*.

Syntax Description

w
specifies the width of the output field.
Default: 8
Range: 1–32000

Details

National characters should be represented in NCR.

Comparisons

The $UNCRE*w*. format performs processing that is the opposite of the $UNCR*w*. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1`
`x='&#22823;abc';` `put x $uncr10.;`	大abc

See Also

Formats:

- "$UNCRw. Format" on page 224

Informats:

- "$UNCRw. Informat" on page 439
- "$UNCREw. Informat" on page 440

$UPARENw. Format

Processes a character string that is encoded in the current SAS session, and then writes the character string in Unicode parenthesis (UPAREN) representation.

Category: Character

Alignment: left

Syntax

$UPAREN*w*.

Syntax Description

w

specifies the width of the output field.

Default: 8

Range: 27–32000

Details

The character string is encoded with parentheses and Unicode hexadecimal representation.

Comparisons

The $UPARENw. format performs processing that is the opposite of the $UPARENEw. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+----2----+----3----+`

`x='大';`
`y='abc3';`
`put x $uparen7.;`
`put y $uparen28.;`
	`<u5927>`
	`<u0061> <u0062> <u0063> <u0033>`

See Also

Formats:

- “$UPARENEw. Format” on page 227

Informats:

- “$UPARENw. Informat” on page 441
- “$UPARENEw. Informat” on page 443

$UPARENE*w*. Format

Processes a character string that is in Unicode parenthesis (UPAREN), and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UPARENE*w*.

Syntax Description

w
specifies the width of the output field.

Default: 8

Range: 1–32000

Comparisons

The $UPARENE*w*. format performs processing that is the opposite of the $UPAREN*w*. format.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+`
`x='<u0061><u0062><u0063><u0033>';` `put x $uparene4.;`	`abc3`

See Also

Formats:

- “$UPARENw. Format” on page 226

Informats:

- “$UPARENw. Informat” on page 441
- “$UPARENEw. Informat” on page 443

$UTF8X*w*. Format

Processes a character string that is in the encoding of the current SAS session, and then writes the character string in universal transformation format (UTF-8) encoding.

Category: Character

Alignment: left

Syntax

$UTF8X*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to include all of the characters in the variable. The width of the characters are dependent on the code point value of the individual characters.

Default: 8

Range: 2–32767

Comparisons

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating environment.

Statements	Results
	`----+----1`
`x ='91E5'x; ; /* Japanese '大 ' in Shift-JIS */` `put x $utf8x10.;`	`x='e5a4a7'x`

See Also

Formats:

- "$UCS2Bw. Format" on page 207
- "$UCS2Lw. Format" on page 210
- "$UCS2Xw. Format" on page 212

Informats:

- "$UCS2Bw. Informat" on page 427
- "$UCS2Lw. Informat" on page 429
- "$UCS2Xw. Informat" on page 431

$UTF8XE*w*. Format

Processes a character string that is in universal transformation format (UTF-8), and then writes the character string in the encoding of the current SAS session.

Category: Character

Alignment: left

Syntax

$UTF8XE*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to include all of the characters in the variable. The width of the characters are dependent on the code point value of the individual characters.

Default: 8

Range: 1–32000

Comparisons

The $UTF8XE*w*. format performs processing that is the opposite to the $UTF8X*w*. format.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating environment.

Statements	Results
	`----+----1`
x = unicode('u5927'); `put x $utf8xe10.;`	大

See Also

Formats:

- “$UTF8Xw. Format” on page 228

Informats:

- “$UTF8Xw. Informat” on page 445

$VSLOG*w*. Format

Processes a character string that is in visual order, and then writes the character string in left-to-right logical order.

Category: BIDI text handling

Alignment: left

Syntax

$VSLOG*w*.

Syntax Description

w
specifies the width of the output field.

Default: 200

Range: 1–32767

Details

The $VSLOG*w*. format is used when transferring data that is stored in visual order. An example is transferring data from a UNIX server to a Windows client.

Note: The $VSLOG*w*. format does not correctly process all combinations of data strings.

Comparisons

The $VSLOG*w*. format performs processing that is opposite to the $VSLOGR*w*. format.

Example

The following example uses the Hebrew input value of "טיסה flight".

Statements	Results
	`----+----1----+----2----+`
`put text $vslog12.;`	טיסה **`flight`**

The following example uses the Arabic input value of " كمبيوتر " computer.

Statements	Results
	`----+----1----+----2----+`
`put text $vslog12.;`	كمبيوتر computer

See Also

Format:

- "$VSLOGRw. Format" on page 232

Informats:

- "$VSLOGw. Informat" on page 446
- "$VSLOGRw. Informat" on page 447

$VSLOGR*w*. Format

Processes a character string that is in visual order, and then writes the character string in right-to-left logical order.

Category: BIDI text handling

Alignment: left

Syntax

$VSLOGR*w*.

Syntax Description

w
specifies the width of the output field.
Default: 200
Range: 1–32767

Details

The $VSLOGR*w*. format is used when transferring data that is stored in visual order. An example is transferring data from a UNIX server to a Windows client.

Note: The $VSLOGR*w*. format does not correctly process all combinations of data strings.

Comparisons

The $VSLOGR*w*. format performs processing that is opposite to the $VSLOG*w*. format.

Example

The following example uses the Hebrew input value of "טיסה flight."

Statements	Results
	`----+----1----+`
`put text $logvs12;`	**`flight`** טיסה

The following example uses the Arabic input value of " ذات " computer.

Statements	Results
	`----+----1----+`
`put text $logvs12;`	ذات computer

See Also

Informats:

- "$VSLOGw. Informat" on page 446
- "$VSLOGRw. Informat" on page 447

WEEKU*w*. Format

Writes a week number in decimal format by using the U algorithm.

Category: Date and Time

Alignment: left

Syntax

WEEKU*w*.

Syntax Description

w

specifies the width of the output field.

Default: 11

Range: 3–200

Details

The WEEKU*w*. format writes a week-number format. The WEEKU*w*. format writes the various formats depending on the specified width. Algorithm U calculates the SAS date value by using the number of the week within the year (Sunday is considered the first day of the week). The number-of-the-week value is represented as a decimal number in the range 0–53, with a leading zero and maximum value of 53. For example, the fifth week of the year would be represented as 05.

Refer to the following table for widths, formats, and examples:

Widths	Formats	Examples
3-4	Www	w01
5-6	yyWww	03W01
7-8	yyWwwdd	03W0101
9-10	yyyyWwwdd	2003W0101
11-200	yyyy-Www-dd	2003-W01-01

Comparisons

The WEEKV*w*. format writes the week number as a decimal number in the range 01–53, with weeks beginning on a Monday and week 1 of the year including both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year. The WEEKW*w*. format writes the week number of the year as a decimal number in the range 00–53, with Monday as the first day of week 1. The WEEKU*w*. format writes the week number of the year (Sunday as the first day of the week) as a decimal number in the range 0–53, with a leading zero.

Example

```
sasdate = '01JAN2003'd;
```

Statements	Results
	`----+----1----+`

`v=put(sasdate,weeku3.);`
`w=put(sasdate,weeku5.);`
`x=put(sasdate,weeku7.);`
`y=put(sasdate,weeku9.);`
`z=put(sasdate,weeku11.);`
`put v;`
`put w;`
`put x;`
`put y;`
`put z;`
	`W00`
	`03W00`
	`03W0004`
	`2003W0004`
	`2003-W00-04`

See Also

Formats:

- “WEEKVw. Format” on page 234
- “WEEKWw. Format” on page 236

WEEKV*w*. Format

Writes a week number in decimal format by using the V algorithm.

Category: Date and Time

Alignment: left

Syntax

WEEKV*w*.

Syntax Description

w

specifies the width of the output field.

Default: 11

Range: 3–200

Details

The WEEKV*w*. format writes the various formats depending on the specified width. Algorithm V calculates the SAS date value, with the number-of-the-week value represented as a decimal number in the range 01–53, with a leading zero and maximum value of 53. Weeks begin on a Monday and week 1 of the year is the week that includes both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year. For example, the fifth week of the year would be represented as 06.

Refer to the following table for widths, formats, and examples:

Widths	Formats	Examples
3-4	Www	w01
5-6	yyWww	03W01
7-8	yyWwwdd	03W0101
9-10	yyyyWwwdd	2003W0101
11-200	yyyy-Www-dd	2003-W01-01

Comparisons

The WEEKV*w*. format writes the week number as a decimal number in the range 01–53, with weeks beginning on a Monday and week 1 of the year including both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year. The WEEKW*w*. format writes the week number of the year as a decimal number in the range 00–53, with Monday as the first day of week 1. The WEEKU*w*. format writes the week number of the year (Sunday as the first day of the week) as a decimal number in the range 0–53, with a leading zero.

Example

```
sasdate='01JAN2003'd;
```

Statements	Results
	`----+----1----+`

Statements	Results

v=put(sasdate,weekv3.);
w=put(sasdate,weekv5.);
x=put(sasdate,weekv7.);
y=put(sasdate,weekv9.);
z=put(sasdate,weekv11.);
put v;
put w;
put x;
put y;
put z;
	W01
	03W01
	03W0103
	2003W0103
	2003-W01-03

See Also

Formats:

- “WEEKUw. Format” on page 233
- “WEEKWw. Format” on page 236

WEEKW*w*. Format

Writes a week number in decimal format by using the W algorithm.

Category: Date and Time

Alignment: left

Syntax

WEEKW*w*.

Syntax Description

w
specifies the width of the output field.
Default: 11
Range: 3–200

Details

The WEEKW*w*. format writes the various formats depending on the specified width. Algorithm W calculates the SAS date value using the number of the week within the year (Monday is considered the first day of the week). The number-of-the-week value is represented as a decimal number in the range 0–53, with a leading zero and maximum value of 53. For example, the fifth week of the year would be represented as 05.

Refer to the following table for widths, formats, and examples:

Widths	Formats	Examples
3-4	Www	w01

Widths	Formats	Examples
5-6	yyWww	03W01
7-8	yyWwwdd	03W0101
9-10	yyyyWwwdd	2003W0101
11-200	yyyy-Www-dd	2003-W01-01

Comparisons

The WEEKV*w*. format writes the week number as a decimal number in the range 01–53. Weeks beginning on a Monday and on week 1 of the year include both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year. The WEEKW*w*. format writes the week number of the year as a decimal number in the range 00–53, with Monday as the first day of week 1. The WEEKU*w*. format writes the week number of the year (Sunday as the first day of the week) as a decimal number in the range 0–53, with a leading zero.

Example

```
sasdate = '01JAN2003'd;
```

Statements	Results
	`----+----1----+`

`v=put(sasdate,weekw3.);`
`w=put(sasdate,weekw5.);`
`x=put(sasdate,weekw7.);`
`y=put(sasdate,weekw9.);`
`z=put(sasdate,weekw11.);`
`put v;`
`put w;`
`put x;`
`put y;`
`put z;`
	`W03`
	`03W03`
	`03W0003`
	`2003W0003`
	`2003-W00-03`

See Also

Formats:

- “WEEKUw. Format” on page 233
- “WEEKVw. Format” on page 234

YEN*w.d* Format

Writes numeric values with yen signs, commas, and decimal points.

Category: Numeric

Alignment: right

Syntax

YEN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 8

Range: 1–32

d

specifies the number of digits to the right of the decimal point in the numeric value.

Range: 0–9

Details

The YEN*w.d* format writes numeric values with a leading yen sign and with a comma that separates every three digits of each value.

The hexadecimal representation of the code for the yen sign character is 5B on EBCDIC systems and 5C on ASCII systems. The monetary character these codes represent might be different in other countries.

Example

```
put cost yen10.2;
```

```
data _null_;
   value=1254.71;
   put value yen10.2;
  run;
```

Cost	Result
	----+----1
1254.71	¥1,254.71

See Also

Informat:

- “YENw.d Informat” on page 448

YYWEEKU*w*. Format

Writes a week number in decimal format by using the U algorithm, excluding day-of-the-week information.

Category: Date and Time

Alignment: left

Syntax

YYWEEKU*w*.

Syntax Description

w

specifies the width of the output field.

Default: 7

Range: 3-8

Details

The YYWEEKU*w*. format writes a week-number format. The YYWEEKU*w*. format writes the various formats depending on the specified width. Algorithm U calculates the SAS date value by using the number of the week within the year (Sunday is considered the first day of the week).

Refer to the following table for widths, formats, and examples:

Widths	Formats	Examples
3-4	Www	W01
5-6	yyWww	07W01
7	yyyyWww	2007W01
8	yyyy-Www	2007-W01
9-above	invalid	invalid

Comparisons

The YYWEEKU*w*. format is similar to the WEEKU*w*. format except that the YYWEEKU*w*. format does not specify the day-of-week information. Also, the YYWEEKU*w*. format does not accept any width that is greater than 8.

Example

```
sasdate = '01JAN2007'd;
```

Statements	Results
	`----+----1----+`

Statements	Results
u=put(sasdate,yyweeku3.);	W00
v=put(sasdate,yyweeku4.);	W00
w=put(sasdate,yyweeku5.);	07W00
x=put(sasdate,yyweeku6.);	07W00
y=put(sasdate,yyweeku7.);	2007W00
z=put(sasdate,yyweeku8.);	2007-W00
put u;	
put v;	
put w;	
put x;	
put y;	
put z;	

See Also

Format:

- "WEEKUw. Format" on page 233

YYWEEKV*w*. Format

Writes a week number in decimal format by using the V algorithm, excluding day-of-the-week information.

Category: Date and Time

Alignment: left

Syntax

YYWEEKV*w*.

Syntax Description

w

specifies the width of the output field.

Default: 7

Range: 3–8

Details

The YYWEEKV*w*. format writes the various formats depending on the specified width. Algorithm V calculates the SAS date value, with the number-of-the-week value represented as a decimal number in the range 01–53, with a leading zero and maximum value of 53. Weeks begin on a Monday and week 1 of the year is the week that includes both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year. For example, the fifth week of the year would be represented as 06.

Refer to the following table for widths, formats, and examples:

Widths	Formats	Examples
3-4	Www	w01
5-6	yyWww	07W01
7	yyyyWww	2007W01
8	yyyy-Www	2007-W01
9-above	invalid	invalid

Comparisons

The YYWEEKV*w*. format is similar to the WEEKV*w*. format except that the YYWEEKV*w*. format does not specify the day-of-week information. Also, the YYWEEKV*w*. format does not accept a width that is greater than 8.

Example

```
sasdate = '01JAN2007'd;
```

Statements	Results
	`----+----1----+`

`u=put(sasdate,yyweekv3.);`
`v=put(sasdate,yyweekv4.);`
`w=put(sasdate,yyweekv5.);`
`x=put(sasdate,yyweekv6.);`
`y=put(sasdate,yyweekv7.);`
`z=put(sasdate,yyweekv8.);`
`put u;`
`put v;`
`put w;`
`put x;`
`put y;`
`put z;`
	`W01`
	`W01`
	`07W01`
	`07W01`
	`2007W01`
	`2007-W01`

See Also

Format:

- “WEEKVw. Format” on page 234

YYWEEKW*w*. Format

Writes a week number in decimal format by using the W algorithm, excluding the day-of-week information.

Category: Date and Time

Alignment: left

Syntax

YYWEEKW*w*.

Syntax Description

w
specifies the width of the output field.
Default: 7
Range: 3–8

Details

The YYWEEKW*w*. format writes the various formats depending on the specified width. Algorithm W calculates the SAS date value using the number of the week within the year.

Refer to the following table for widths, formats, and examples:

Widths	Formats	Examples
3-4	Www	W01
5-6	yyWww	07W01
7	yyyyWww	2007W01
8	yyyy-Www	2007-W01
9-above	invalid	invalid

Comparisons

The YYWEEKW*w*. format is similar to the WEEKW*w*. format except that the YYWEEKW*w*. format does not specify the day-of-week information. Also, the YYWEEKW*w*. format does not accept any width that is greater than 8.

Example

```
sasdate = '01JAN2007'd
```

Statements	Results
	`----+----1----+`

Statements	Results

u=put(sasdate,yyweekw3.);
v=put(sasdate,yyweekw4.);
w=put(sasdate,yyweekw5.);
x=put(sasdate,yyweekw6.);
y=put(sasdate,yyweekw7.);
z=put(sasdate,yyweekw8.);
put u;
put v;
put w;
put x;
put y;
put z;
	W01
	W01
	07W01
	07W01
	2007W01
	2007-W01

See Also

Format:

- “WEEKWw. Format” on page 236

Part 5

Functions for NLS

Chapter 10

Internationalization Compatibility for SAS String Functions

Internationalization Compatibility for SAS String Functions

SAS provides string functions and CALL routines that enable you to easily manipulate your character data. Many of the original SAS string functions assume that the size of one character is always one byte. This process works well for data in a single-byte character set (SBCS). However, when some of these functions and CALL routines are used with data in a double-byte character set (DBCS) or multi-byte character set (MBCS), the data is often handled improperly and produce incorrect results.

DBCS encodings require a varying number of bytes to represent each character. MBCS is sometimes used as a synonym for DBCS.

To solve this problem SAS introduced a set of string functions and CALL routines, called K functions, for those string manipulations where DBCS and MBCS data must be handled carefully. This page shows the level of I18N compatibility for each SAS string function. I18N is the abbreviation for internationalization. Compatibility indicates whether a program using a particular string function can be adapted to different languages and locales without program changes.

The user needs to understand the difference between byte-based offset-length and character-based offset-length in order to use the K functions properly. Most K functions require the character-based offset or length. Under SBCS environments, the byte-based unit is identical to character-based unit. However, under DBCS or MBCS environment, there are significant differences, and programmers need to distinguish them. The users might need to change the programming logic in order to use the K functions. Most K functions require strings encoded in current SAS session encoding.

String functions are assigned I18N levels depending on whether the functions can process DBCS, MBCS, or SBCS. Here are descriptions of the levels:

I18N Level 0
: This function is designed for SBCS data. Do not use this function to process DBCS or MBCS data.

I18N Level 1
: This function should be avoided, if possible, if you are processing DBCS or MBCS data. The I18N Level 1 functions might not work correctly with DBCS or MBCS encodings under certain circumstances.

I18N Level 2
This function can be used for SBCS, DBCS, and MBCS (UTF-8) data.

Table 10.1 *SAS String Functions*

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"ANYALNUM Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for an alphanumeric character, and returns the first position at which the character is found.			X
"ANYALPHA Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for an alphabetic character, and returns the first position at which the character is found.			X
"ANYCNTRL Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a control character, and returns the first position at which that character is found.			X
"ANYDIGIT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a digit, and returns the first position at which the digit is found.			X
"ANYFIRST Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is valid as the first character in a SAS variable name under VALIDVARNAME=V7, and returns the first position at which that character is found.			X
"ANYGRAPH Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a graphical character, and returns the first position at which that character is found.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"ANYLOWER Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a lowercase letter, and returns the first position at which the letter is found.			X
"ANYNAME Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is valid in a SAS variable name under VALIDVARNAME=V7, and returns the first position at which that character is found.			X
"ANYPRINT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a printable character, and returns the first position at which that character is found.			X
"ANYPUNCT Function" in *SAS Functions and CALL Routines: Reference*	searches a character string for a punctuation character, and returns the first position at which that character is found.			X
"ANYSPACE Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a white-space character (blank, horizontal and vertical tab, carriage return, line feed, and form feed). Returns the first position at which that character is found.			X
"ANYUPPER Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for an uppercase letter, and returns the first position at which the letter is found.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"ANYXDIGIT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a hexadecimal character that represents a digit, and returns the first position at which that character is found.			X
"BYTE Function" in *SAS Functions and CALL Routines: Reference*	Returns one character in the ASCII or the EBCDIC collating sequence.	X		
"CAT Function" in *SAS Functions and CALL Routines: Reference*	Does not remove leading or trailing blanks, and returns a concatenated character string.			X
"CATS Function" in *SAS Functions and CALL Routines: Reference*	Removes leading and trailing blanks, and returns a concatenated character string.	X		
"CATT Function" in *SAS Functions and CALL Routines: Reference*	Removes trailing blanks, and returns a concatenated character string.	X		
"CATX Function" in *SAS Functions and CALL Routines: Reference*	Removes leading and trailing blanks, inserts delimiters, and returns a character string.	X		
"CHOOSEC Function" in *SAS Functions and CALL Routines: Reference*	Returns a character value that represents the results of choosing from a list of arguments.			X
"CHOOSEN Function" in *SAS Functions and CALL Routines: Reference*	Returns a numeric value that represents the results of choosing from a list of arguments.			X
"COALESCEC Function" in *SAS Functions and CALL Routines: Reference*	Returns the first nonmissing value from a list of numeric arguments.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"COALESCEC Function" in *SAS Functions and CALL Routines: Reference*	Returns a character string in ASCII or EBCDIC collating sequence.	X		
"COMPARE Function" in *SAS Functions and CALL Routines: Reference*	Returns the position of the leftmost character by which two strings differ, or returns 0 if there is no difference.	X		
"COMPARE Function" in *SAS Functions and CALL Routines: Reference*	Removes multiple blanks from a character string.	X		
"COMPGED Function" in *SAS Functions and CALL Routines: Reference*	Returns the generalized edit distance between two strings.	X		
"COMPLEV Function" in *SAS Functions and CALL Routines: Reference*	Returns the Levenshtein edit distance between two strings.	X		
"COMPRESS Function" in *SAS Functions and CALL Routines: Reference*	Returns a character string with specified characters removed from the original string.	X		
"COUNT Function" in *SAS Functions and CALL Routines: Reference*	Counts the number of times that a specified substring appears within a character string.		X	
"COUNTC Function" in *SAS Functions and CALL Routines: Reference*	Counts the number of characters in a string that appear or do not appear in a list of characters.		X	
"DEQUOTE Function" in *SAS Functions and CALL Routines: Reference*	Removes matching quotation marks from a character string that begins with a quotation mark, and deletes all characters to the right of the closing quotation mark.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
“FIND Function” in *SAS Functions and CALL Routines: Reference*	Searches for a specific substring of characters within a character string.		X	
“FINDC Function” in *SAS Functions and CALL Routines: Reference*	Searches a string for any character in a list of characters.		X	
“HTMLDECODE Function” in *SAS Functions and CALL Routines: Reference*	Decodes a string that contains HTML numeric character references or HTML character entity references, and returns the decoded string.			X
“HTMLENCODE Function” in *SAS Functions and CALL Routines: Reference*	Encodes characters using HTML character entity references, and returns the encoded string.			X
“IFC Function” in *SAS Functions and CALL Routines: Reference*	Returns a character value based on whether an expression is true, false, or missing.			X
“IFN Function” in *SAS Functions and CALL Routines: Reference*	Returns a numeric value based on whether an expression is true, false, or missing.			X
“INDEX Function” in *SAS Functions and CALL Routines: Reference*	Searches a character expression for a string of characters, and returns the position of the string's first character for the first occurrence of the string.	X		
“INDEXC Function” in *SAS Functions and CALL Routines: Reference*	Searches a character expression for any of the specified characters, and returns the position of that character.	X		

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"INDEXW Function" in *SAS Functions and CALL Routines: Reference*	Searches a character expression for a string that is specified as a word, and returns the position of the first character in the word.	X		
"KCOMPARE Function" (p. 271)	Returns the result of a comparison of character expressions.			X
"KCOMPRESS Function" (p. 271)	Removes specified characters from a character expression.			X
"KCOUNT Function" (p. 272)	Returns the number of double-byte characters in an expression.			X
"KCVT Function" (p. 272)	Converts data from one type of encoding data to another encoding data.			X
"KINDEX Function" (p. 274)	Searches a character expression for a string of characters.			X
"KINDEXC Function" (p. 275)	Searches a character expression for specified characters.			X
"KLEFT Function" (p. 276)	Left-aligns a character expression by removing unnecessary leading DBCS blanks and SO-SI.			X
"KLENGTH Function" (p. 276)	Returns the length of an argument.			X
"KLOWCASE Function" (p. 277)	Converts all letters in an argument to lowercase.			X
"KREVERSE Function" (p. 282)	Reverses a character expression.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"KRIGHT Function" (p. 283)	Right-aligns a character expression by trimming trailing DBCS blanks and SO-SI.			X
"KSCAN Function" (p. 283)	Selects a specified word from a character expression.			X
"KSTRCAT Function" (p. 284)	Concatenates two or more character expressions.			X
"KSUBSTR Function" (p. 285)	Extracts a substring from an argument.			X
"KSUBSTRB Function" (p. 285)	Extracts a substring from an argument according to the byte position of the substring in the argument.			X
"KTRANSLATE Function" (p. 286)	Replaces specific characters in a character expression.			X
"KTRIM Function" (p. 287)	Removes trailing DBCS blanks and SO-SI from character expressions.			X
"KTRUNCATE Function" (p. 288)	Truncates a numeric value to a specified length.			X
"KUPCASE Function" (p. 288)	Converts all letters in an argument to uppercase.			X
"KUPDATE Function" (p. 289)	Inserts, deletes, and replaces character value contents.			X
"KUPDATEB Function" (p. 290)	Inserts, deletes, and replaces the contents of the character value according to the byte position of the character value in the argument.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"KVERIFY Function" (p. 291)	Returns the position of the first character that is unique to an expression.			X
"LEFT Function" in *SAS Functions and CALL Routines: Reference*	Left-aligns a character string.	X		
"LENGTH Function" in *SAS Functions and CALL Routines: Reference*	Returns the length of a non-blank character string, excluding trailing blanks, and returns 1 for a blank character string.	X		
"LENGTHC Function" in *SAS Functions and CALL Routines: Reference*	Returns the length of a character string, including trailing blanks.			X
"LENGTHM Function" in *SAS Functions and CALL Routines: Reference*	Returns the amount of memory (in bytes) that is allocated for a character string.			X
"LENGTHN Function" in *SAS Functions and CALL Routines: Reference*	Returns the length of a character string, excluding trailing blanks.	X		
"LOWCASE Function" in *SAS Functions and CALL Routines: Reference*	Converts all letters in an argument to lowercase.			X
"MISSING Function" in *SAS Functions and CALL Routines: Reference*	Returns a numeric result that indicates whether the argument contains a missing value.			X
"NLITERAL Function" in *SAS Functions and CALL Routines: Reference*	Converts a character string that you specify to a SAS name literal.			X
"NOTALNUM Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a non-alphanumeric character, and returns the first position at which the character is found.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"NOTALPHA Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a nonalphabetic character, and returns the first position at which the character is found.			X
"NOTCNTRL Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is not a control character, and returns the first position at which that character is found.			X
"NOTDIGIT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for any character that is not a digit, and returns the first position at which that character is found.			X
"NOTFIRST Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for an invalid first character in a SAS variable name under VALIDVARNAME=V7, and returns the first position at which that character is found.			X
"NOTGRAPH Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a non-graphical character, and returns the first position at which that character is found.			X
"NOTLOWER Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is not a lowercase letter, and returns the first position at which that character is found.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"NOTNAME Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for an invalid character in a SAS variable name under VALIDVARNAME=V7, and returns the first position at which that character is found.			X
"NOTPRINT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a nonprintable character, and returns the first position at which that character is found.	X		
"NOTPUNCT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is not a punctuation character, and returns the first position at which that character is found.	X		
"NOTSPACE Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is not a white-space character (blank, horizontal and vertical tab, carriage return, line feed, and form feed), and returns the first position at which that character is found.	X		
"NOTUPPER Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is not an uppercase letter, and returns the first position at which that character is found.			X
"NOTXDIGIT Function" in *SAS Functions and CALL Routines: Reference*	Searches a character string for a character that is not a hexadecimal character, and returns the first position at which that character is found.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"NVALID Function" in *SAS Functions and CALL Routines: Reference*	Checks the validity of a character string for use as a SAS variable name.	X		
"PROPCASE Function" in *SAS Functions and CALL Routines: Reference*	Converts all words in an argument to proper case.			X
"QUOTE Function" in *SAS Functions and CALL Routines: Reference*	Adds double quotation marks to a character value.			X
"RANK Function" in *SAS Functions and CALL Routines: Reference*	Returns the position of a character in the ASCII or EBCDIC collating sequence.	X		
"REPEAT Function" in *SAS Functions and CALL Routines: Reference*	Returns a character value that consists of the first argument repeated n+1 times.		X	
"REVERSE Function" in *SAS Functions and CALL Routines: Reference*	Reverses a character string.	X		
"RIGHT Function" in *SAS Functions and CALL Routines: Reference*	Right-aligns a character expression.	X		
"SCAN Function" in *SAS Functions and CALL Routines: Reference*	Returns the nth word from a character string.	X		
"SOUNDEX Function" in *SAS Functions and CALL Routines: Reference*	Encodes a string to facilitate searching.	X		
"SPEDIS Function" in *SAS Functions and CALL Routines: Reference*	Determines the likelihood of two words matching, expressed as the asymmetric spelling distance between the two words.	X		
"STRIP Function" in *SAS Functions and CALL Routines: Reference*	Returns a character string with all leading and trailing blanks removed.	X		

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"SUBPAD Function" in *SAS Functions and CALL Routines: Reference*	Returns a substring that has a length that you specify, using blank padding if necessary.		X	
"SUBSTR (left of =) Function" in *SAS Functions and CALL Routines: Reference*	Extracts a substring from an argument.	X		
"SUBSTRN Function" in *SAS Functions and CALL Routines: Reference*	Returns a substring, allowing a result with a length of zero.		X	
"TRANSLATE Function" in *SAS Functions and CALL Routines: Reference*	Replaces specific characters in a character string.	X		
"TRANTAB Function" on page 313 "TRANTAB Function" on page 313	Transcodes data by using the specified translation table.	X		
"TRANWRD Function" in *SAS Functions and CALL Routines: Reference*	Replaces or removes all occurrences of a substring in a character string.			X
"TRIM Function" in *SAS Functions and CALL Routines: Reference*	Removes trailing blanks from a character string, and returns one blank if the string is missing.	X		
"TRIMN Function" in *SAS Functions and CALL Routines: Reference*	Removes trailing blanks from character expressions, and returns a string with a length of zero if the expression is missing.	X		
"UPCASE Function" in *SAS Functions and CALL Routines: Reference*	Converts all letters in an argument to uppercase.			X
"URLDECODE Function" in *SAS Functions and CALL Routines: Reference*	Returns a string that was decoded using the URL escape syntax.			X
"URLENCODE Function" in *SAS Functions and CALL Routines: Reference*	Returns a string that was encoded using the URL escape syntax.			X

Function	Description	I18N Level 0	I18N Level 1	I18N Level 2
"VERIFY Function" in *SAS Functions and CALL Routines: Reference*	Returns the position of the first character in a string that is not in any of several other strings.	X		

Chapter 11

Function Entries

Functions by Category

The following categories relate to NLS issues:

Table 11.1 *Categories of NLS Functions*

Category	Description
Character	processes character data
Currency Conversion	converts one currency to another currency
DBCS	processes double-byte character set.
Date and Time	processes data and time data.
Locale	processes data based on the specified locale.
Variable Information	processes variable information.

Category	Language elements	Description
Character	KCVT Function (p. 272)	Converts data from one type of encoding data to another encoding data.
	TRANTAB Function (p. 313)	Transcodes data by using the specified translation table.
	UNICODE Function (p. 314)	converts Unicode characters to the current SAS session encoding.
	UNICODEC Function (p. 316)	converts characters in the current SAS session encoding to Unicode characters.
	UNICODELEN Function (p. 318)	specifies the length of the character unit for the Unicode data.
	UNICODEWIDTH Function (p. 318)	specifies the length of a display unit for the Unicode data.
Date and Time	NLDATE Function (p. 292)	Converts the SAS date value to the date value of the specified locale by using the date format descriptors.
	NLDATM Function (p. 294)	Converts the SAS datetime value to the time value of the specified locale by using the datetime-format descriptors.

Category	Language elements	Description
	NLTIME Function (p. 297)	Converts the SAS time or the datetime value to the time value of the specified locale by using the NLTIME descriptors.
DBCS	KCOMPARE Function (p. 271)	Returns the result of a comparison of character expressions.
	KCOMPRESS Function (p. 271)	Removes specified characters from a character expression.
	KCOUNT Function (p. 272)	Returns the number of double-byte characters in an expression.
	KINDEX Function (p. 274)	Searches a character expression for a string of characters.
	KINDEXC Function (p. 275)	Searches a character expression for specified characters.
	KLEFT Function (p. 276)	Left-aligns a character expression by removing unnecessary leading DBCS blanks and SO/SI.
	KLENGTH Function (p. 276)	Returns the length of an argument.
	KLOWCASE Function (p. 277)	Converts all letters in an argument to lowercase.
	KPROPCASE Function (p. 277)	Converts Chinese, Japanese, Korean, Taiwanese (CJKT) characters.
	KPROPCHAR Function (p. 280)	Converts special characters to normal characters.
	KPROPDATA Function (p. 281)	Removes or converts unprintable characters.
	KREVERSE Function (p. 282)	Reverses a character expression.
	KRIGHT Function (p. 283)	Right-aligns a character expression by trimming trailing DBCS blanks and SO/SI.
	KSCAN Function (p. 283)	Selects a specified word from a character expression.
	KSTRCAT Function (p. 284)	Concatenates two or more character expressions.
	KSUBSTR Function (p. 285)	Extracts a substring from an argument.
	KSUBSTRB Function (p. 285)	Extracts a substring from an argument according to the byte position of the substring in the argument.
	KTRANSLATE Function (p. 286)	Replaces specific characters in a character expression.
	KTRIM Function (p. 287)	Removes trailing DBCS blanks and SO/SI from character expressions.

Category	Language elements	Description
	KTRUNCATE Function (p. 288)	Truncates a string to a specified length in byte unit without breaking multibyte characters.
	KUPCASE Function (p. 288)	Converts all letters in an argument to uppercase.
	KUPDATE Function (p. 289)	Inserts, deletes, and replaces character value contents.
	KUPDATEB Function (p. 290)	Inserts, deletes, and replaces the contents of the character value according to the byte position of the character value in the argument.
	KVERIFY Function (p. 291)	Returns the position of the first character that is unique to an expression.
Encoding	ENCODCOMPAT Function (p. 265)	Verifies the transcoding compatibility between two encodings.
	ENCODISVALID Function (p. 266)	specifies a valid encoding name.
Locale	GETLOCENV Function (p. 267)	Returns the current locale/language environment.
	GETPXLANGUAGE Function (p. 268)	Returns the current two-letter language code.
	GETPXLOCALE Function (p. 269)	Returns the POSIX locale value for a SAS locale.
	GETPXREGION Function (p. 270)	Returns the current two-letter region code.
	SASMSG Function (p. 298)	Specifies a message from a data set. The returned message is based on the current locale and a specified key.
	SASMSGL Function (p. 301)	Specifies a message from a data set. The message is based on a specified locale value and a specified key value.
	SORTKEY Function (p. 304)	creates a linguistic sort key.
	SETLOCALE Function (p. 306)	Specifies the locale keys for the current SAS locale.
Variable Information	VARTRANSCODE Function (p. 319)	Returns the transcode attribute of a SAS data set variable.
	VTRANSCODE Function (p. 321)	Returns a value that indicates whether transcoding is enabled for the specified character variable.
	VTRANSCODEX Function (p. 322)	Returns a value that indicates whether transcoding is enabled for the specified argument.

Dictionary

ENCODCOMPAT Function

Verifies the transcoding compatibility between two encodings.

Category: Encoding

Syntax

ENCODCOMPAT(*source1,<source2>*)

Required Arguments

source1
a character string that represents an encoding.

source2
a character string that represents an encoding. This argument is optional.

Details

If you specify one encoding, the function verifies the compatibility of the specified encoding with the current SAS session encoding.

If you specify two encodings, the function verifies the compatibility of the two encodings.

The function compares two encoding identifiers and determines whether the data needs to be transcoded. *Source1* is the source encoding. *Source2* is the destination encoding. Transcoding 7-bit ASCII to another type of ASCII is compatible, but transcoding ASCII to 7-bit ASCII might not be compatible.

The ENCODCOMPAT function specifies the following values:

–1	*Source1* is not a valid encoding name.
–2	*Source2* is not a valid encoding name.
0	The encodings are not compatible. Transcoding is needed.
1	The encodings are compatible. Transcoding is not needed.
2	A newline character is detected.

Example

The following examples demonstrate the ENCODCOMPAT features:

Statements	Results

`/* session encoding is wlatin1 */`
`isCompat= EncodCompat(“xyz”);`
`put isValid;`
	`-1`

`/* session encoding is wlatin1 */`
`isCompat= EncodCompat (“cp1252”);`
`put isValid;`
	`1`

`isCompat= EncodCompat`
`(“ebcdic1149”,”open_ed-1149”);`
`put isValid;`
	`2`

`isCompat= EncodCompat`
`(“cp1251”,”ebcdic1149”);`
`put isValid;`
	`0`

ENCODISVALID Function

specifies a valid encoding name.

Category: Encoding

Syntax

ENCODISVALID(*source*)

Required Argument

source
a character string that represents an encoding name.

Details

The ENCODISVALID function returns the following values:

0 the character string is not a valid encoding name.

1 the character string is a valid short encoding name.

2 the character string is a valid long encoding name.

3 the character string is a valid alias encoding name.

Example

The following examples demonstrate the ENCODISVALID features:

SAS Statements	Results
`isValid= EncodIsValid(“xyz”);` `put isValid;`	`0`

SAS Statements	Results
`isValid= EncodIsValid("wlt2");` `put isValid;`	`1`
`isValid= EncodIsValid("wlatin2");` `put isValid;`	`2`

`isValid= EncodIsValid("cp1250");`
 	
`put isValid;`
	`3`

GETLOCENV Function

Returns the current locale/language environment.

Category: Locale

Syntax

GETLOCENV( )

Details

The GETLOCENV function returns the locale/language environment value for a valid SAS locale. The following environment values are possible:

SBCS
: The SAS session encoding is SBCS (Single-Byte Character Set). SASWZSD is loaded for string manipulation.

DBCS
: The SAS session encoding is DBCS (Double-Byte Character Set). SASWZSD is loaded for string manipulation.

MBCS
: The SAS session encoding is Unicode(UTF8). SASWZSU is loaded for string manipulation.

If you receive a blank value, then the WZSS subsystem is not available. This action suggests a configuration or installation error.

Example

In the following example, the LOCALE= system option is set to French_France.

Statements	Results

option locale=french_france;
environ=getlocenv();
put environ;
	SBCS

GETPXLANGUAGE Function

Returns the current two-letter language code.

Category: Locale

Syntax

GETPXLANGUAGE()

Details

The GETPXLANGUAGE function returns the two-letter language code based on the current value of the LOCALE= SAS system option. The length of the language name is two characters. If the size of the variable that receives the value is less than two characters, the value is truncated.

Example

In the first example, the LOCALE= system option is set to French_France. The second example is set to German. The third example is set to English_United States.

Statements	Results

option locale=french_france;
lang=getpxLanguage();
put lang;
	fr

option locale=German;
lang=getpxLanguage();
put lang;
	de

option locale=en_US;
lang=getpxLanguage();
put lang;
	en

See Also

System Options:

- “LOCALE System Option” on page 480

Functions:

- “GETPXREGION Function” on page 270
- “GETPXLOCALE Function” on page 269

GETPXLOCALE Function

Returns the POSIX locale value for a SAS locale.

Category: Locale

Syntax

GETPXLOCALE(<*source*>)

Required Argument

<source>
is an optional argument that specifies a locale name.

Details

The GETPXLOCALE function returns the POSIX locale value for a valid SAS locale name. If you specify an invalid locale name, then a null string is returned. If you do not specify a value for the <*source*> argument, then the function returns the POSIX name for the current SAS session. The length of the POSIX locale name is five characters. If the size of the variable that receives the value is less than five characters, the value is truncated.

Example

In the first example, the LOCALE= system option is set to French_France. In the second example, the <*source*> argument is set to German_Germany. In the third example, the <*source*> argument is set to English_United States.

Statements	Results

option locale=french_france;
locale=getpxLocale();
put locale;
	fr_FR

locale=getpxLocale("german_germany"); put locale;	de_DE
locale=getpxLocale("english_unitedstates"); put locale;	en_US

See Also

System Options:

- “LOCALE System Option” on page 480

Functions:

- “GETPXLANGUAGE Function” on page 268
- “GETPXREGION Function” on page 270

GETPXREGION Function

Returns the current two-letter region code.

Category: Locale

Syntax

GETPXREGION()

Details

The GETPXREGION function returns the two-letter region code based on the current LOCALE= SAS system option. The length of the region name is two characters. If the size of the variable that receives the value is less than two characters, the value is truncated.

Example

In the first example the LOCALE= system option is set to French_France. The second example is set to German. The third example is set to English_United States.

Statements	Results

option locale=french_france;
region=getpxRegion();
put region;
	FR

option locale=German;
region=getpxRegion();
put region;
	DE

option locale=en_US;
region=getpxRegion();
put region;
	US

See Also

System Options:

- “LOCALE System Option” on page 480

Functions:

- “GETPXLOCALE Function” on page 269
- “GETPXLANGUAGE Function” on page 268

KCOMPARE Function

Returns the result of a comparison of character expressions.

Category: DBCS

Tip: Non-DBCS equivalent function is the “COMPARE Function” in *SAS Functions and CALL Routines: Reference*.

Syntax

KCOMPARE(*source*,<*pos*, <*count*,>> *findstr*)

Required Arguments

source
specifies the character expression to be compared.

pos
specifies the starting position in *source* to begin the comparison. If *pos* is omitted, the entire *source* is compared. If *pos* is less than 0, *source* is assumed as extended DBCS data that does not contain any SO/SI characters.

count
specifies the number of bytes to compare. If *count* is omitted, all of *source* that follows *pos* is compared, except for any trailing blanks.

findstr
specifies the character expression to compare to *source*.

Details

KCOMPARE returns values as follows:

- a negative value if *source* is less than *findstr*
- 0 if *source* is equal to *findstr*
- a positive value if *source* is greater than *findstr*

KCOMPRESS Function

Removes specified characters from a character expression.

Category: DBCS

Tip: Non-DBCS equivalent function is COMPARE in *SAS Functions and CALL Routines: Reference*.

Syntax

KCOMPRESS(*source*,<*characters-to-remove*>)

Required Arguments

source
specifies a character expression that contains the characters to be removed. When only *source* is specified, KCOMPRESS returns this expression with all of the single and double-byte blanks removed.

characters-to-remove
specifies the character or characters that KCOMPRESS removes from the character. If characters-to-remove is omitted, KCOMPRESS removes all blanks.expression.

Tip: Enclose a literal string of characters in quotation marks.

See Also

Functions:

- "KLEFT Function" on page 276
- "KTRIM Function" on page 287

KCOUNT Function

Returns the number of double-byte characters in an expression.

Category: DBCS

Syntax

KCOUNT(*source*)

Required Argument

source
specifies the character expression to count.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

KCVT Function

Converts data from one type of encoding data to another encoding data.

Category: Character

Syntax

KCVT(*text, intype, outtype*, <*options*,…>)

Required Arguments

text
specifies the character variable to be converted.

intype
specifies the encoding of the data. The encoding of the text must match the input data's encoding. For valid values, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

ASCIIANY and EBCIDICANY are invalid encoding values.

outtype
specifies the encoding to be converted into character data. For valid values see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

ASCIIANY and EBCIDICANY are invalid encoding values.

options
specifies character data options. Here are the available options:

NOSOSI | NOSHIFT	No shift code or Hankaku characters.
INPLACE	Replaces character data by conversion. The INPLACE option is specified to secure the same location between different hosts whose lengths of character data are not identical. For example, the INPLACE option converts data from the host which requires Shift-Codes, into the other host, which does not require shift codes. Truncation occurs when the length of the character data that is converted into *outtype* for Shift-Codes is longer than the length that is specified in *intype*.
KANA	Includes Hankaku katakana characters in columns of character data.
UPCASE	Converts 2-byte alphabet to uppercase characters.
LOWCASE	Converts 2-byte alphabet to lowercase characters.
KATA2HIRA	Converts katakana data to Hiragana.
HIRA2KATA	Converts Hiragana data to katakana.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KCVT function converts SBCS, DBCS, and MBCS character strings into encoding data. For example, the KCVT function can convert: ASCII code data to UCS2 encoding data, Greek code data to UTF-8, and Japanese SJIS code data to another Japanese code data. You can specify the following types for Intype and Outtype options: UCS2, UCS2L, UCS2B, and UTF8. To enable the DBCS mode, specify the following SAS options in the configuration file or in the command line.

- DBCS
- DBCSLANG Japanese or Korean or Chinese or Taiwanese
- DBCSTYPE dbcstype value

Example

The following code converts IBM PC codes into DEC codes for the external text file specified as *my-input-file*, and writes in OUTDD.

```
data _null_;
   infile 'my-input-file';
   file outdd noprint;
   input @1 text $char80.;
   text = kcvt(text, 'pcibm', 'dec');
   put @1 text $char80.;
run;
```

See Also

System options:

- "DBCS System Option: UNIX, Windows, and z/OS" on page 470
- "DBCSLANG System Option: UNIX, Windows, and z/OS" on page 471
- "DBCSTYPE System Option: UNIX, Windows, and z/OS" on page 472

Procedure:

- Chapter 16, "DBCSTAB Procedure," on page 527

KINDEX Function

Searches a character expression for a string of characters.

Category: DBCS

Tip: Non-DBCS equivalent function is INDEX in *SAS Functions and CALL Routines: Reference*

Syntax

KINDEX(*source, excerpt*)

Required Arguments

source
specifies the character expression to search.

excerpt
specifies the string of characters to search for in the character expression.

Tip: Enclose a literal string of characters in quotation marks.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KINDEX function searches *source*, from left to right, for the first occurrence of the string that is specified in *excerpt*, and returns the position in *source* of the string's first character. If the string is not found in *source*, KINDEX returns a value of 0. If there are

multiple occurrences of the string, KINDEX returns only the position of the first occurrence.

See Also

Functions:

- "KINDEXC Function" on page 275

KINDEXC Function

Searches a character expression for specified characters.

Category: DBCS

Tip: Non-DBCS equivalent function is "INDEXC Function" in *SAS Functions and CALL Routines: Reference*

Syntax

KINDEXC(*source,excerpt-1*<,… *excerpt-n*>)

Required Arguments

source
specifies the character expression to search.

excerpt
specifies the characters to search for in the character expression.

Tip: If you specify more than one excerpt, separate them with a comma.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KINDEXC function searches *source*, from left to right, for the first occurrence of any character present in the excerpts and returns the position in *source* of that character. If none of the characters in *excerpt-1* through *excerpt-n* in *source* are found, KINDEXC returns a value of 0.

Comparisons

The KINDEXC function searches for the first occurrence of any individual character that is present within the character string, whereas the KINDEX function searches for the first occurrence of the character string as a pattern.

See Also

Function:

- "KINDEX Function" on page 274

KLEFT Function

Left-aligns a character expression by removing unnecessary leading DBCS blanks and SO/SI.

Category: DBCS

Tip: Non-DBCS equivalent function is LEFT in *SAS Functions and CALL Routines: Reference*.

Syntax

KLEFT(*argument*)

Required Argument

argument
specifies any SAS character expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

KLEFT returns an argument and removes the leading blanks.

See Also

Functions:

- "KCOMPRESS Function" on page 271
- "KRIGHT Function" on page 283
- "KTRIM Function" on page 287

KLENGTH Function

Returns the length of an argument.

Category: DBCS

Tip: Non-DBCS equivalent function is LENGTH in *SAS Functions and CALL Routines: Reference*.

Syntax

KLENGTH(*argument*)

Required Argument

argument
specifies any SAS expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KLENGTH function returns an integer that represents the position of the rightmost non-blank character in the argument. If the value of the argument is missing, KLENGTH returns a value of 1. If the argument is an uninitialized numeric variable, KLENGTH returns a value of 12 and prints a note in the SAS log that the numeric values have been converted to character values.

KLOWCASE Function

Converts all letters in an argument to lowercase.

Category: DBCS

Tip: Non-DBCS equivalent function is LOWCASE in *SAS Functions and CALL Routines: Reference*.

Syntax

KLOWCASE(*argument*)

Required Argument

argument
specifies any SAS character expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KLOWCASE function copies a character argument, converts all uppercase letters to lowercase letters, and returns the altered value as a result.

KPROPCASE Function

Converts Chinese, Japanese, Korean, Taiwanese (CJKT) characters.

Category: DBCS

Syntax

str=**KPROPCASE**(<*instr*> , (<options>))

Required Arguments

str
data string that has been converted and is in the current SAS session encoding.

instr
input data string.

options

converts Japanese, Chinese, Korean, and Taiwanese characters based on specified options.

HALF-KATAKANA, FULL-KATAKANA

This option converts half-width Katakana to full-width Katakana and is used only with Japanese encoding.

Restriction: This option cannot be used at the same time with the full-Katakana, half-Katakana option.

FULL-KATAKANA, HALF-KATAKANA

This option converts full-width Katakana to half-width Katakana and is used only with Japanese encoding.

Restriction: This option cannot be used at the same time with the half-Katakana, full-Katakana option.

KATAKANA, ROMAJI

This option converts the Katakana character string to a Romaji character string and is used only with Japanese encoding.

Restriction: This option cannot be used at the same time with the Romaji, Katakana option.

ROMAJI, KATAKANA

This option converts the Romaji character string to a Katakana character string and is used only with Japanese encoding.

Restriction: This option cannot be used at the same time with the Katakana, Romaji option.

FULL-ALPHABET, HALF-ALPHABET

This option converts the Full-Alphabet characters to Half-Alphabet characters and is used only with Japanese, Chinese, Korean, and Taiwanese encoding.

Restriction: This option cannot be used at the same time with the Half-Alphabet, Full-Alphabet option.

HALF-ALPHABET, FULL-ALPHABET

This option converts the Half-Alphabet characters to Full-Alphabet characters and is used only with Japanese, Chinese, Korean, and Taiwanese encoding.

Restriction: This option cannot be used at the same time with the Full-Alphabet, Half-Alphabet option.

LOWERCASE, UPPERCASE

This option converts lowercase alphabet characters to uppercase alphabet characters.

Restriction: This option cannot be used at the same time with the Uppercase, Lowercase option.

UPPERCASE, LOWERCASE

This option converts uppercase alphabet characters to lowercase alphabet characters.

Restriction: This option cannot be used at the same time with the Lowercase, Uppercase option.

PROPER

This option specifies the following default options based on the encoding:

- Japanese encoding
- Half-Katakana,Full-Katakana
- Full-alphabet, Half-alphabet

- Lowercase, Uppercase
- Korean encoding:
- Full-alphabet, Half-alphabet
- Chinese encoding:
- Full-alphabet, Half-alphabet
- Taiwanese encoding:
- Full-alphabet, Half-alphabet

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

This function converts the input string based on the specified options and default options. The KPROPCASE function supports the Chinese, Japanese, Korean, Taiwanese (CJKT) environment.

Example

The following example demonstrates the functionality of the KPROPCASE function:

```
length fullkana halfkana upper lower fullalpha $ 200;
length str1 str2 str3 str4 str5 str7 str8 $ 30 str6 $44;
lower = 'do-naxtutsu';  /* Doughnuts in Japanese Roman word. */
upper = 'DO-NAXTUTSU';  /* Doughnuts in Japanese Roman word. */
fullkana = unicode('\u30C9\u30FC\u30CA\u30C3\u30C4');
halfkana = unicode('\uFF84\uFF9E\uFF70\uFF85\uFF6F\uFF82');
fullalpha = unicode('\uFF24\uFF2F\uFF0D\uFF2E\uFF21\uFF38\uFF34\uFF35\uFF34\
uFF33\uFF35');
str1 = kpropcase(fullkana, 'full-katakana,half-katakana');
if (halfkana EQ trim(str1)) then
  put str1= $hex14.;
str2 = kpropcase(halfkana, 'half-katakana, full-katakana');
if (fullkana EQ trim(str2)) then
  put str2= $hex22.;
str3 = kpropcase(fullkana, 'katakana,romaji');
if (trim(str3) EQ upper) then
  put str3=  ;
str4 = kpropcase(upper, 'romaji,katakana');
if (trim(str4) EQ fullkana) then
  put str4= $hex22.;
str5 = kpropcase(fullalpha, 'full-alphabet, half-alphabet');
if (trim(upper) EQ str5) then
  put str5=;
str6 = kpropcase(upper, 'half-alphabet, full-alphabet');
if (trim(str6) EQ fullalpha) then
  put str6= $hex46.;
str7 = kpropcase(lower, 'lowercase, uppercase');
if (trim(str7) EQ upper) then
  put str7=;
str8 = kpropcase(upper, 'uppercase, lowercase');
if (trim(str8) EQ lower) then
 put str8=;
RESULTS:
```

```
str1=C4DEB0C5AFC220
str2=8368815B83698362836320
str3=DO-NAXTUTSU
str4=8368815B83698362836320
str5=DO-NAXTUTSU
str6=8263826E817C826D8260827782738274827382728274 20
str7=DO-NAXTUTSU
str8=do-naxtutsu
```

KPROPCHAR Function

Converts special characters to normal characters.

Category: DBCS

Syntax

str=**KPROPCHAR**(<*instr*>)

Required Arguments

str
result string. Special characters are converted to normal characters.

instr
input data string.

Details

This function converts special characters to normal characters. The KPROPCHAR function converts the characters from the following ranges:

- Enclosed alphanumeric values: \u2460 to \u24FF. See **http://www.unicode.org/charts/PDF/U2460.pdf**.
- Dingbats: \u2776 to \u2793. See **http://www.unicode.org/charts/PDF/U2700.pdf**.
- Enclosed CJK letters and months: \u3200 to \u32FF. See **http://www.unicode.org/charts/PDF/U3200.pdf**.

Example

The following example demonstrates the functionality of the KPROPCHAR function:

```
length in1 out1 $30 ;
  in1=unicode('\u2460\u2473\u277F\u325F');
  out1=KPROPCHAR(in1);
  put out1;
RESULTS:
(1)(20)(-10)(35)
```

KPROPDATA Function

Removes or converts unprintable characters.

Category: DBCS

Syntax

str=**KPROPDATA**(<*instr*> (<option, input encode name, output encode name>))

Required Arguments

str
data string that has been converted and is in session encoding.

instr
input data string.

options
specifies instructions on processing unprintable characters:

UESC
Converts unprintable characters using a Unicode escaped string (for example, \u0000\u1234).

TRIM
Removes unprintable characters. No replacement character is used.

BLANK or ' '
Replaces each unprintable character with a single-byte blank.

QUESTION or '?'
Replaces unprintable characters with a single-byte '?'.

HEX
Replaces unprintable characters with a hexadecimal representation (for example, 0x810x82).

TRUNCATE or TRUNC
Truncates the data string when the first unprintable character is encountered.

REMOVE
Removes the data string if any unprintable characters are found.

NCR
Encodes the unprintable characters using NCR representation if the code is available in Unicode.

input encode name
specifies the input data's encoding name if necessary. If the input encode name is not specified, then the KPROPDATA function processes the data as the current SAS session encoded string. For information on SAS encoding names, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

output encode name
specifies the output data's encoding name. If the encoding name is not specified, the KPROPDATA function recognizes the output as the current SAS session encoding. For information on SAS encoding names, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

Details

This function converts the input data string to the current SAS session encoding and removes or replaces unprintable characters based on the options.

Example

The following example demonstrates the functionality of the KPROPDATA function:

```
length instr $12;
  length str1 str2 str3 str4 str5 str6 str7 str8 str9 str10$ 50;
  instr = "534153"x||"ae"x || " System";
  put instr;
  str1 = kpropdata(instr);
  put str1= +2 str1= $hex26.;
  str2 = kpropdata(instr,'UESC');
  put str2= +2 str2= $hex26.;;
  str3 = kpropdata(instr, 'UESC','wlatin1');
  put str3= +2 str3= $hex34.;
  str4 = kpropdata(instr,'TRIM','wlatin1');
  put str4= +2 str4= $hex26.;
  str5 = kpropdata(instr,'BLANK', 'wlatin1');
  put str5= +2 str5= $hex26.;
  str6 = kpropdata(instr,'?', 'wlatin1');
  put str6= +2 str6= $hex26.;
  str7 = kpropdata(instr,'hex', 'wlatin1');
  put str7= +2 str7= $hex26.;
  str8 = kpropdata(instr,'TRUNC', 'wlatin1');
  put str8= +2 str8= $hex26.;
  str9 = kpropdata(instr,'REMOVE', 'wlatin1');
  put str9= +2 str9= $hex26.;
  str10 = kpropdata(instr,'NCR', 'wlatin1');
  put str10= +2 str10= $hex26.;
RESULTS:
SAS? System
str1=SAS? System   str1=534153AE2053797374656D2020
str2=SAS? System   str2=534153AE2053797374656D2020
str3=SAS\uff6e System   str3=5341535C756666366652053797374656D20
str4=SAS System   str4=53415320537973746 56D202020
str5=SAS  System   str5=534153202053797374656D2020
str6=SAS? System   str6=5341533F2053797374656D2020
str7=SAS\xAE System   str7=5341535C784145205379737465
str8=SAS   str8=53415320202020202020202020
str9=    str9=20202020202020202020202020
str10=SAS® System   str10=53415326233137343B20537973
```

KREVERSE Function

Reverses a character expression.

Category: DBCS

Tip: Non-DBCS equivalent function is REVERSE in *SAS Functions and CALL Routines: Reference*.

Syntax

KREVERSE(*argument*)

Required Argument

argument
specifies any SAS character expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

KRIGHT Function

Right-aligns a character expression by trimming trailing DBCS blanks and SO/SI.

Category: DBCS

Tip: See "RIGHT Function" in *SAS Functions and CALL Routines: Reference*.

Syntax

KRIGHT(*argument*)

Required Argument

argument
specifies any SAS character expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KRIGHT function returns an argument with trailing blanks moved to the start of the value. The argument's length does not change.

See Also

Functions:

- "KCOMPRESS Function" on page 271
- "KLEFT Function" on page 276
- "KTRIM Function" on page 287

KSCAN Function

Selects a specified word from a character expression.

Category: DBCS

Tip: Non-DBCS equivalent function is SCAN in *SAS Functions and CALL Routines: Reference*.

Syntax

KSCAN(*argument,n*<, *delimiters*>)

Required Arguments

argument
specifies any character expression.

n
specifies a numeric expression that produces the number of the word in the character expression you want KSCAN to select.

Tip: If *n* is negative, KSCAN selects the word in the character expression starting from the end of the string. If |*n*| is greater than the number of words in the character expression, KSCAN returns a blank value.

delimiters
specifies a character variable that produces characters that you want KSCAN to use as word separators in the character expression.

Default: If you omit *delimiters* in an ASCII environment, SAS uses *blank . < (+ & ! $ *) ; ^ – / , % |*. In ASCII environments without the ^ character, KSCAN uses the ~ character instead.

If you omit *delimiters* on an EBCDIC environment, SAS uses *blank . < (+ | & ! $ *) ; ¬ – / , % | ¢*

Tip: If you represent *delimiters* as a constant, enclose *delimiters* in quotation marks.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

Leading delimiters before the first word in the character string do not effect KSCAN. If there are two or more contiguous delimiters, KSCAN treats them as one.

KSTRCAT Function

Concatenates two or more character expressions.

Category: DBCS

Tip: Non-DBCS equivalent function is CAT in *SAS Functions and CALL Routines: Reference*.

Syntax

KSTRCAT(*argument-1*, *argument-2*<, … *argument-n*>)

Required Argument

argument
specifies any single-byte or double-byte character expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

KSTRCAT concatenates two or more single-byte or double-byte character expressions. It also removes unnecessary SO/SI pairs between the expressions.

KSUBSTR Function

Extracts a substring from an argument.

Category: DBCS

Tip: See "SUBSTR (left of =) Function" in *SAS Functions and CALL Routines: Reference*.

Syntax

KSUBSTR(*argument,position*<,*n*>)

Required Arguments

argument
specifies any SAS character expression.

position
specifies a numeric expression that is the beginning character position.

n
specifies a numeric expression that is the length of the substring to extract.

Interaction: If *n* is larger than the length of the expression that remains in *argument* after *position*, SAS extracts the remainder of the expression.

Tip: If you omit *n*, SAS extracts the remainder of the expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KSUBSTR function returns a portion of an expression that you specify in *argument*. The portion begins with the character specified by *position* and is the number of characters specified by *n*.

A variable that is created by KSUBSTR obtains its length from the length of *argument*.

See Also

Function:

- "KSUBSTRB Function" on page 285

KSUBSTRB Function

Extracts a substring from an argument according to the byte position of the substring in the argument.

Category: DBCS

Syntax

KSUBSTRB(*argument,position*<,*n*>)

Required Arguments

argument
specifies any SAS character expression.

position
specifies the beginning character position in byte units.

n
specifies the length of the substring to extract in byte units.

Interaction: If *n* is larger than the length (in byte units) of the expression that remains in *argument* after *position*, SAS extracts the remainder of the expression.

Tip: If you omit *n*, SAS extracts the remainder of the expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KSUBSTRB function returns a portion of an expression that you specify in *argument*. The portion begins with the byte unit specified by *position* and is the number of byte units specified by *n*.

A variable that is created by KSUBSTRB obtains its length from the length of *argument*.

See Also

Function:

- "KSUBSTR Function" on page 285

KTRANSLATE Function

Replaces specific characters in a character expression.

Category: DBCS

Tip: Non-DBCS equivalent function is TRANSLATE in *SAS Functions and CALL Routines: Reference*.

See: KTRANSLATE Function under z/OS

Syntax

KTRANSLATE(*source,to-1,from-1*<,…*to-n,from-n*>)

Required Arguments

source
specifies the SAS expression that contains the original character value.

to
specifies the characters that you want KTRANSLATE to use as substitutes.

from
specifies the characters that you want KTRANSLATE to replace.

Interaction: Values of *to* and *from* correspond on a character-by-character basis; KTRANSLATE changes character one of *from* to character one of *to*, and so on. If *to* has fewer characters than *from*, KTRANSLATE changes the extra *from* characters to blanks. If *to* has more characters than *from*, KTRANSLATE ignores the extra *to* characters.

Note: You must have pairs of *to* and *from* arguments on some operating environments. On other operating environments, a segment of the collating sequence replaces null *from* arguments. See the SAS documentation for your operating environment for more information.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

You can use KTRANSLATE to translate a single-byte character expression to a double-byte character expression, or translate a double-byte character expression to a single-byte character expression.

The maximum number of pairs of *to* and *from* arguments that KTRANSLATE accepts depends on the operating environment you use to run SAS. There is no functional difference between using several pairs of short arguments, or fewer pairs of longer arguments.

KTRIM Function

Removes trailing DBCS blanks and SO/SI from character expressions.

Category: DBCS

Tip: Non-DBCS equivalent function is "TRIM Function" in *SAS Functions and CALL Routines: Reference*.

Syntax

KTRIM(*argument*)

Required Argument

argument
specifies any SAS character expression.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

KTRIM copies a character argument, removes all trailing blanks, and returns the trimmed argument as a result. If the argument is blank, KTRIM returns one blank. KTRIM is useful for concatenating because concatenation does not remove trailing blanks.

Assigning the results of KTRIM to a variable does not affect the length of the receiving variable. If the trimmed value is shorter than the length of the receiving variable, SAS pads the value with new blanks as it assigns it to the variable.

See Also

Functions:

- "KCOMPRESS Function" on page 271
- "KLEFT Function" on page 276
- "KRIGHT Function" on page 283

KTRUNCATE Function

Truncates a string to a specified length in byte unit without breaking multibyte characters.

Category: DBCS

Syntax

KTRUNCATE(*argument*, *number*, *length*)

Required Arguments

argument
specifies any SAS character expression.

number
is numeric.

length
is an integer.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KTRUNCATE function truncates a full-length *number* (stored as a double) to a smaller number of bytes, as specified in *length* and pads the truncated bytes with 0s. The truncation and subsequent expansion duplicate the effect of storing numbers in less than full length and then reading them.

KUPCASE Function

Converts all letters in an argument to uppercase.

Category: DBCS

Tip: See “UPCASE Function” in *SAS Functions and CALL Routines: Reference*.

Syntax

KUPCASE(*argument*)

Required Argument

argument
specifies any SAS character expression.

Details

See “Internationalization Compatibility for SAS String Functions” on page 247 for restrictions and more information.

The KUPCASE function copies a character argument, converts all lowercase letters to uppercase letters, and returns the altered value as a result.

KUPDATE Function

Inserts, deletes, and replaces character value contents.

Category: DBCS

Syntax

KUPDATE(*argument,position,n<, characters-to-replace>*)

KUPDATE(*argument,position<,n>* , *characters-to-replace*)

Required Arguments

argument
specifies a character variable.

position
specifies a numeric expression that is the beginning character position.

n
specifies a numeric expression that is the length of the substring to be replaced.

Restrictions:
n cannot be larger than the length of the expression that remains in *argument* after *position*.

n is optional, but you cannot omit both *n* and *characters-to-replace* from the function.

Tip: If you omit *n*, SAS uses all of the characters in *characters-to-replace* to replace the values of *argument*.

characters-to-replace
specifies a character expression that replaces the contents of *argument*.

Restriction: *characters-to-replace* is optional, but you cannot omit both *characters-to-replace* and *n* from the function.

Tip: Enclose a literal string of characters in quotation marks.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KUPDATE function replaces the value of *argument* with the expression in *characters-to-replace*. KUPDATE replaces *n* characters starting at the character you specify in *position*.

Note: If you set the NLSCOMPATMODE system option to on, parameter, *characters-to-replace*, processes the data based on previous SAS releases. If NLSCOMPATMODE is off, then *characters-to-replace* uses the 9.2 functionality. See the following table for examples.

Statements	Results
NLSCOMPATEMODE kkupdate("123456", 2,3);	156
NLSCOMPATEMODE kupdate("123456", 2,3,"abcd");	1abcd56
NONLSCOMPATEMODE kupdate("123456", 2,3);	1 56
NONLSCOMPATEMODE kupdate("123456", 2,3,"abcd");	1abc56

See Also

Functions:

- "KUPDATEB Function" on page 290

System Options:

- "NLSCOMPATMODE System Option: z/OS" on page 483

KUPDATEB Function

Inserts, deletes, and replaces the contents of the character value according to the byte position of the character value in the argument.

Category: DBCS

Syntax

KUPDATEB(*argument,position,n<,characters-to-replace>*)

KUPDATEB(*argument,position <, n>* , *characters-to-replace*)

Required Arguments

argument
specifies a character variable.

position
specifies the beginning character position in byte units.

n
specifies the length of the substring to be replaced in byte units.

Restrictions:
n cannot be larger than the length (in bytes) of the expression that remains in *argument* after *position*.

n is optional, but you cannot omit both *n* and *characters-to-replace* from the function.

Tip: If you omit *n*, SAS uses all of the characters in *characters-to-replace* to replace the values of *argument*.

characters-to-replace
specifies a character expression to replace the contents of *argument*.

Restriction: *characters-to-replace* is optional, but you cannot omit both *characters-to-replace* and *n* from the function.

Tip: Enclose a literal string of characters in quotation marks.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KUPDATEB function replaces the value of *argument* with the expression in *characters-to-replace*. KUPDATEB replaces *n* byte units starting at the byte unit that you specify in *position*.

See Also

Function:

- "KUPDATE Function" on page 289

KVERIFY Function

Returns the position of the first character that is unique to an expression.

Category: DBCS

Tip: See "VERIFY Function" in *SAS Functions and CALL Routines: Reference*

Syntax

KVERIFY(*source,excerpt-1*<,…*excerpt-n*>)

Required Arguments

source
specifies any SAS character expression.

excerpt
specifies any SAS character expression. If you specify more than one excerpt, separate them with a comma.

Details

See "Internationalization Compatibility for SAS String Functions" on page 247 for restrictions and more information.

The KVERIFY function returns the position of the first character in *source* that is not present in any *excerpt*. If KVERIFY finds every character in *source* in at least one *excerpt*, it returns a 0.

NLDATE Function

Converts the SAS date value to the date value of the specified locale by using the date format descriptors.

Category: Date and Time

Syntax

NLDATE(*date,descriptor*)

Required Arguments

date
specifies a SAS date value.

descriptor
is a variable or expression that specifies how dates and times are formatted in output. The following descriptors are case sensitive:

#
removes the leading zero from the result.

%%
specifies the % character.

%a
specifies the short-weekday descriptor. The range for the day descriptor is Mon–Sun.

%A
specifies the long-weekday descriptor. The range for the long-weekday descriptor is Monday–Sunday.

%b
specifies the short-month descriptor. The range for the short-month descriptor is Jan–Dec.

%B
specifies the long-month descriptor. The range for the long-month descriptor is January–December.

%C
specifies the long-month descriptor and uses blank padding. The range for the long-month descriptor is January–December.

%d
specifies the day descriptor and uses 0 padding. The range for the day modifier is 01–31.

%e
specifies the day descriptor and uses blank padding. The range for the day descriptor is 01–31.

%F
specifies the long-weekday descriptor and uses blank padding. The range for the day descriptor is Monday–Sunday.

%j
specifies the day-of-year descriptor as a decimal number and uses a leading zero. The range for the day-of-year descriptor is 1–366.

%m
specifies the month descriptor and uses 0 padding. The range for the month descriptor is 01–12.

%o
specifies the month descriptor. The range for the month descriptor is 1–12 with blank padding.

%u
specifies the weekday descriptor as a number in the range 1–7 that represents Monday–Sunday.

%U
specifies the week-number-of-year descriptor by calculating the descriptor value as the SAS date value using the number of week within the year (Sunday is considered the first day of the week). The number-of-the-week value is represented as a decimal number in the range 0–53 and uses a leading zero and a maximum value of 53.

%V
specifies the week-number-of-year descriptor by calculating the descriptor value as the SAS date value. The number-of-week value is represented as a decimal number in the range 01–53 and uses a leading zero and a maximum value of 53. Weeks begin on a Monday and week 1 of the year is the week that includes both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year.

%w
specifies the weekday descriptor as a number in the range 0–6 that represents Sunday–Saturday.

%W
specifies the week-number-of-year descriptor by calculating the descriptor value as SAS date value by using the number of week within the year (Monday is considered the first day of the week). The number-of-week value is represented as a decimal number in the range 0–53 and uses a leading zero and a maximum value of 53.

%y
specifies the year (2-digit) modifier. The range for the year descriptor is 00–99.

%Y
specifies the year (4-digit) descriptor. The range for the year descriptor is 1970–2069.

Details

The NLDATE function converts the SAS date value to the date value of the specified locale by using the date descriptors.

Example

The following example shows a log filename that is created from a SAS date value.

Statements	Results

`options locale=English_Unitedstates;`
`logfile=nldate('24Feb2003'd,'%B-%d.log');`
`put logfile;`
	`February-24.log`

`options locale=German_Germany;`
`logfile=nldate('24Feb2003'd,'%B-%d.log');`
`put logfile;`
	`Februar-24.log`

The following example shows a weekday name that is created from a SAS date value.

Statements	Results
	`----+----1----+`

`options locale=English_unitedstates;`
`weekname=nldate('24Feb2003'd,'%A');`
`put weekname;`
	`Monday`

`options locale=German_Germany;`
`weekname=nldate('24Feb2003'd,'%A');`
`put weekname;`
	`Montag`

See Also

Format:

- “NLDATEw. Format” on page 104

NLDATM Function

Converts the SAS datetime value to the time value of the specified locale by using the datetime-format descriptors.

Category: Date and Time

Syntax

NLDATM(*datetime,descriptor*)

Required Arguments

datetime
specifies a SAS datetime value.

descriptor
is a variable or expression that specifies how dates and times are formatted in output. The following descriptors are case sensitive:

#
removes the leading zero from the result.

%%
specifies the % character.

%a
specifies the short-weekday descriptor. The range for the day descriptor is Mon–Sun.

%A
specifies the long-weekday descriptor. The range for the long-weekday descriptor is Monday–Sunday.

%b
specifies the short-month descriptor. The range for the short-month descriptor is Jan–Dec.

%B
specifies the long-month descriptor. The range for the long-month descriptor is January–December.

%c
specifies the long-month descriptor and uses blank padding. The range for the long-month descriptor is January–December.

%d
specifies the day descriptor and uses 0 padding. The range for the day descriptor is 01–31.

%e
specifies the day descriptor and uses blank padding. The range for the day descriptor is 01–31.

%F
specifies the long-weekday descriptor and uses blank padding. The range for the day descriptor is Monday–Sunday.

%H
specifies the hour descriptor that is based on a 24-hour clock. The range for the hour descriptor is 00–23.

%I
specifies the hour descriptor that is based on a 12-hour clock. The range for the hour descriptor is 01–12.

%j
specifies the day-of-year descriptor as a decimal number and uses a leading zero. The range for the day-of-year descriptor is 1–366.

%m
specifies the month descriptor and uses 0 padding. The range for the month descriptor is 01–12.

%M
specifies the minute descriptor. The range for the minute descriptor is 00–59.

%o
specifies the month descriptor and uses blank padding. The range for the month descriptor is 1–12.

%p
specifies a.m. or p.m. descriptor.

%S
specifies the second descriptor. The range for the second descriptor is 00–59.

%u
specifies the weekday descriptor as a number in the range of 1–7 that represents Monday–Sunday.

%U
specifies the week-number-of-year descriptor by calculating the descriptor value as the SAS date value and uses the number-of-week value within the year (Sunday is considered the first day of the week). The number-of-week value is represented as a decimal number in the range 0–53. A leading zero and a maximum value of 53 is used.

%V
specifies the week-number-of-year descriptor by calculating the descriptor value as the SAS date value. The number-of-week value is represented as a decimal number in the range 01–53. A leading zero and a maximum value of 53 is used. Weeks begin on a Monday and week 1 of the year is the week that includes both January 4th and the first Thursday of the year. If the first Monday of January is the 2nd, 3rd, or 4th, the preceding days are part of the last week of the preceding year.

%w
specifies the weekday descriptor as a number in the range of 0–6 that represents Sunday–Saturday.

%W
specifies the week-number-of-year descriptor by calculating the descriptor value as SAS date value using the number of week within the year (Monday is considered the first day of the week). The number-of-week value is represented as a decimal number in the range of 0–53. A leading zero and a maximum value of 53 are used.

%y
specifies the year (2-digit) descriptor. The range for the year descriptor is 00–99.

%Y
specifies the year (4-digit) descriptor. The range for the year descriptor is 1970–2069.

Details

The NLDATM function converts the SAS datetime value to the datetime value of the specified locale by using the datetime descriptors.

Example

The following example shows a time (a.m or p.m.) that is created from a SAS datetime value.

Statements	Results
	`----+----1----+`

`options locale=English;`
`time_ampm=nldatm('24Feb2003:12:39:43'dt,'%I%p');`
`put time_ampm;`
	`12PM`

`options locale=German;`
`time_ampm=nldatm('24Feb2003:12:39:43'dt,'%I%p');`
`put time_ampm;`
	`12nachm`

See Also

Format:

- "NLDATMw. Format" on page 113

NLTIME Function

Converts the SAS time or the datetime value to the time value of the specified locale by using the NLTIME descriptors.

Category: Date and Time

Syntax

NLTIME(*time*|*datetime*,*descriptor*,*startpos*)

Required Arguments

time
specifies a SAS time value.

datetime
specifies a SAS datetime value.

descriptor
is a variable, or expression, that specifies the value of a descriptor. You can enter the following descriptors in uppercase or lowercase:

#
removes the leading zero from the result.

%%
specifies the % character.

%H
specifies the hour descriptor that is based on a 24-hour clock. The range for the hour descriptor is 00–23.

%I
specifies the hour descriptor that is based on a 12-hour clock. The range for the hour descriptor is 01–12.

%M
specifies the minute modifier. The range for the minute descriptor is 00–59.

%P
specifies the a.m. or p.m. descriptor.

%S
specifies the second descriptor. The range for the second descriptor is 00–59.

startpos
is an integer that specifies the position at which the search should start and that specifies the direction of the search.

Details

The NLTIME function converts a SAS time or datetime value to the time value of the specified locale by using the time descriptors.

Example

The following example shows an a.m. or p.m. time that is created from a SAS time.

Statements	Results
	`----+----1----+`

`options locale=English;`
`time_ampm=nltime('12:39:43't,'%i%p');`
`put time_ampm;`
	`00 PM`

`options locale=German;`
`time_ampm=nltime('12:39:43't,'%i%p');`
`put time_ampm;`
	`00 nachm`

See Also

Format:

- “NLTIMEw. Format” on page 206

SASMSG Function

Specifies a message from a data set. The returned message is based on the current locale and a specified key.

Category: Locale

Syntax

SASMSG (*BASENAME", "KEY", <<"QUOTE"|"DQUOTE"|"NOQUOTE"> <, "substitution 1", ..., "substitution 7">>*)

Required Arguments

BASENAME
the name of the data set where the message is located.

KEY
the message key.

Note: If you specify an invalid key name, then the key name is returned.

QUOTE|DQUOTE|NOQUOTE
specifies the type of quotes that are added to the message text and substitution strings.

Default: DQUOTE

substitution
string substitutions. The maximum string substitutions is 7.

Details

The SAS message data set must be a 7-bit ASCII data set. Any character that cannot be represented in the 7-bit ASCII encoding is represented in the Unicode escape format of '\uxxxx', where 'xxxx' is the base 10 numeric representation of the Unicode value of the character.

The data set used by the SASMSG function must have been created specifically for use with this function. The dataset must contain the following variables:

#	Variable Name	Type	Length	Description
1	locale	char	5	language of the message
2	key	char	60	key to identify the message
3	lineno	num	5	line # of the message in reverse order
4	text	text	1,200	text of the message

The data set must be sorted on the following variables: *locale*, *key*, and *lineno*. The variable *lineno* must be in descending order. A composite index on locale and key must be defined. Here is a sample program to sort and create an indexed data set:

```
%let basename=MyProduct;

proc sort data=t.&basename;
by locale key descending lineno;
```

```
run;

proc datasets lib=t
memtype=data;
modify &basename;
index create indx=(LOCALE KEY);
run;
quit;
```

The returned message is based on the LOCALE system option. The LOCALE option is represented by *ll_RR* where ll represents the two-letter language code and RR represents the two-letter region code. If a match is not found, then the function searches for a match with the language only. If the pair locale and key are still not found, then the function defaults to the English language (en). If the key does not exist for English (en), then the key name is returned.

You can alter formatting. You can use string substitution by using the format code %s. You can change the order of substitution. In some cases, translation of a message to a language other than English might require changing the order of substitutions. You can change the order by placing an argument number specification, *#nn*, within a format string, where *nn* is the number of the argument in the substitution list. The following example demonstrates the order:

Statement	Result
`msg = sasmsg ("nls.mymsg","IN_CD_LOG", "noquote","cat","dog"); IN_CD_LOGINFO = My %#1s. Your %#2s`	`msg= My cat. Your dog.`
`IN_CD_LOGINFO = My %#2s. Your %#1s`	`msg= My dog. Your cat.`

The SASMSG function can be used in the open code macro with the %SYSFUNC macro function.

Arguments that are passed to a function called by the %SYSFUNC macro must not be in quotes while arguments passed to the SASMSG function outside of %SYSFUNC must be quoted.

When the SASMSG function is used with the %SYSFUNC macro function the returned string is wrapped with the %NRBQUOTE function.

Examples

Example 1

The following example demonstrates the formatting feature of SASMSG:

```
%macro demo_sasmsg;
  data _null_;
    msg = sasmsg("nls.mymsg","IN_APW_SAVE_OK","noquote");
    put msg=;
  run;
%mend demo_sasmsg;
```

SAS Statements	Results
`options locale = en_US;` `%demo_sasmsg ;`	`msg=The Access Control key was successfully saved.`
`options locale = es_ES;` `%demo_sasmsg;`	`msg=La clave de control de acceso se ha guardado.`
`options locale = french_France;` `%demo_sasmsg;`	`msg=La clé de contrôle d'accès a bien été enregistrée.`

Example 2

The following example demonstrates the open macro feature:

```
%MACRO PRT(loc,tb,key);
    option locale=&loc;
    %PUT %SYSFUNC(SASMSG(&tb,&key) );
%MEND PRT;
```

SAS Statements	Results
`%PRT(en_US,&TABLEID,IN_EDIT)`	`"Edit"`
`%PRT(es_ES,&TABLEID,IN_EDIT)`	`"Editar"`
`%PRT(fr_FR,&TABLEID,IN_EDIT)`	`"Modifier"`

SASMSGL Function

Specifies a message from a data set. The message is based on a specified locale value and a specified key value.

Category: Locale

Syntax

SASMSGL(*("BASENAME", "KEY", "LOCALE", <<"Q"|"D"|"N"><, "substitution 1", ..., "substitution 6">>)*

Required Arguments

BASENAME
the name of the data set where the message is located.

KEY
the message key.

Note: If you specify an invalid key name, then the key name is returned.

LOCALE
the posix locale value (ll_RR).

QUOTE|DQUOTE|NOQUOTE
specifies the type of quotes that are added to the message text and substitution strings.

Default: DQUOTE

substitution
string substitutions. The maximum string substitutions is 6.

Details

The SAS message data set must be a 7-bit ASCII data set. Any character that cannot be represented in the 7-bit ASCII encoding is represented in the Unicode escape format of '*uxxxx*, where the *xxxx* is the base 10 numeric representation of the Unicode value of the character.

The data set used by SASMSGL function must have been created specifically for use with this function. The dataset must contain the following variables:

#	Variable Name	Type	Length	Description
1	locale	char	5	language of the message
2	key	char	60	key to identify the message
3	lineno	num	5	line number of the message in reverse order
4	text	text	1200	text of the message

The data set must be sorted on the following variables: *locale*, *key*, and *lineno*. The variable *lineno* must be in descending order. A composite index on locale and key must be defined. Here is a sample program to sort and create an indexed data set:

```
%let basename=MyProduct;

proc sort data=t.&basename;
by locale key descending lineno;
run;

proc datasets lib=t
memtype=data;
modify &basename;
index create indx=(LOCALE KEY);
run;
quit;
```

The returned message is based on the LOCALE system option. The LOCALE option is represented by *ll_RR* where *ll* represents the two- letter language code and RR represents the two-letter region code. If a match is not found, then the function searches for a match with the language only. If the pair locale and key are still not found, then the function defaults to the English language (en). If the key does not exist for English (en), then the key name is returned.

You can alter formatting. You can use string substitution by using the format code %s. You can change the order of substitution. In some cases, translation of a message to a language other than English might require changing the order of substitutions. You can change the order by placing an argument number specification, *#nn*, within a format string, where *nn* is the number of the argument in the substitution list. The following example demonstrates changing the order:

Statement	Result
`msg = sasmsgl ("nls.mymsg","IN_CD_LOG","en_US","N", "cat","dog"); IN_CD_LOGINFO = My %#1s. Your %#2s`	`msg= My cat. Your dog.`
`IN_CD_LOGINFO = My %#2s. Your %#1s`	`msg= My dog. Your cat.`

The SASMSGL function can be used in the open code macro with the %SYSFUNC macro function.

Arguments that are passed to a function called by the %SYSFUNC macro must not be in quotes while arguments passed to the SASMSGL function outside of %SYSFUNC must be quoted.

When the SASMSGL function is used with the %SYSFUNC macro function, the returned string is wrapped with the %NRBQUOTE function.

Examples

Example 1

The following example demonstrates the formatting feature of SASMSGL:

Statements	Results
`sasmsgl("nls.mymsg", "IN_APW_SAVE_OK", "e`	`The Access Control key was successfully saved.`
`sasmsgl("nls.mymsg", "IN_APW_SAVE_OK", "e`	`La clave de control de acceso se ha guardado.`
`sasmsgl("nls.mymsg", "IN_APW_SAVE_OK", "f`	`La clé de contrôle d'accès a bien été enregistrée.`

Example 2

The following example demonstrates the open macro feature:

SAS Statements	Results
`%PUT %SYSFUNC(SASMSGL(NLS.MYDS, IN_ASD_LA "Edit"`	
`%PUT %SYSFUNC(SASMSGL(NLS.MYDS, IN_ASD_LA "Editar"`	
`%PUT %SYSFUNC(SASMSGL(NLS.MYDS, IN_ASD_LA "Modifier"`	

SORTKEY Function

creates a linguistic sort key.

Category: Locale

Syntax

sortKey(string, <locale, strength, case, numeric, order>)

Required Arguments

string
character expression

locale
specifies the locale name in the form of a POSIX name (ja_JP). See Table 18.1 on page 561 for a list of locale names and Posix values.

strength
The value of strength is related to the collation level. There are five collation-level values. The following table provides information regarding the five levels. The default value for strength is related to the locale.

Value	Type of Collation	Description
PRIMARY or P	PRIMARY specifies differences between base characters (for example, "a" < "b").	It is the strongest difference. For example, dictionaries are divided into different sections by base character.
SECONDARY or S	Accents in the characters are considered secondary differences (for example, "as" < "às" < "at").	Other differences between letters can also be considered secondary differences, depending on the language. A secondary difference is ignored when there is a primary difference anywhere in the strings.
TERTIARY or T	Upper and lower case differences in characters are distinguished at the tertiary level (for example, "ao" < "Ao" < "aò").	An example is the difference between large and small Kana. A tertiary difference is ignored when there is a primary or secondary difference anywhere in the strings.
QUATERNARY or Q	When punctuation is ignored at level 1-3, an additional level can be used to distinguish words with and without punctuation (for example, "ab" < "a-b" < "aB").	This difference is ignored when there is a primary, secondary, or tertiary difference. The quaternary level should be used if ignoring punctuation is required or when processing Japanese text.

IDENTICAL or I	When all other levels are equal, the identical level is used as a tiebreaker. The Unicode code point values of the NFD form of each string are compared at this level, just in case there is no difference at levels 1-4.	For example, only Hebrew cantillation marks are distinguished at this level. This level should be used sparingly, as only code point values differences between two strings is an extremely rare occurrence.

case order

sorts uppercase and lowercase letters. This argument is valid for only TERTIARY, QUATERNARY, or IDENTICAL. The following table provides the values and information for the case order argument.

Value	Description
UPPER or U	Sorts upper case letters first, then the lower case letters.
LOWER or L	Sorts lower case letters first, then the upper case letters.

numeric collation

orders numbers by the numeric value instead of the number's characters.

Value	Description
NUMERIC or N	Order numbers (integers) by the numeric value. For example, "8 Main St." would sort before "45 Main St.".

collation order

There are two types of collation values: Phonebook and Traditional. If you do not select a collation value, then the user's locale-default collation is selected. The following table provides more information.

Value	Description
PHONEBOOK or P	specifies a phonebook style ordering of characters. Select PHONEBOOK only with the German language.
TRADITIONAL or T	specifies a traditional style ordering of characters. Select TRADITIONAL only with the Spanish language.

Details

The SORTKEY function creates a linguistic sort key for data. You must enter at least one argument. If the length of the variable that receives the key is not large enough, the data truncates, and a warning is displayed.

locale

Locale values use the POSIX name (ll_RR). LL represents the two-letter language code, and RR represents the two-letter region code. For example, en_US is the POSIX name for English, United States. en represents the English language, and US

represents the United States. If a locale value is not specified, then the session locale is used.

strength
The strength argument determines whether accents or case affect collating or matching text. If no value is specified for strength, then the locale determines the value. The following values can be specified for strength.

PRIMARY
This value includes base letters, for example, the letters, A, a, and Å are all processed the same.

SECONDARY
This value processes data the same as PRIMARY, and accents are processed. The letters A and a are processed equally, and Å is processed as an accented character.

TERTIARY
This value processes data the same as SECONDARY, and the character's case is processed. For example, A, a, and Å are all processed differently.

QUATERNARY
This value processes data the same as TERTIARY, and punctuation is processed.

IDENTICAL
This value process data the same as QUATERNARY, and code point is processed.

case order
specifies to sort data using upper case or lower case letter. The following table shows examples of specifying the UPPER value or the LOWER value.

UPPER	LOWER
Aztec	aztec
aztec	Aztec
Mars	mars
mars	Mars

collation order
The collation order value PHONEBOOK is ignored unless the locale is a German language.

The collation order value TRADITIONAL is ignored unless the locale is a Spanish language.

A warning message displays for other locales.

SETLOCALE Function

Specifies the locale keys for the current SAS locale.

Category: Locale

Syntax

Setting SAS Locale

SETLOCALE(*sas_locale*)

Customize single locale elements

SETLOCALE(*key, value*)

Customize single locale elements

SETLOCALE(*category_name,sas_locale*)

Required Arguments

sas_locale
specifies a SAS locale name by using the SAS name or the posix name. You can also specify the locale alias.

key
specifies a SAS locale element key. See the list of element keys in the Details section.

value
specifies a value for the locale element.

category_name
specifies the category name:

- LC_TIME
- LC_MONETARY
- LC_NUMERIC
- LC_ALL

Details

You can modify the following locale elements. The value of *key* must be less than the value of *max length*. You can specify the following values for *type*:

0 String.

1 Unsigned integer. You must use double quotation marks.

Locale Element Key	Max Length	Type	Category
DATESTYLE	3	0	
PAPERSIZE	8	0	
FTITLE	512	0	
FTEXT	512	0	
SIMFONT	512	0	
SORTSEQ	8	0	
MESSAGES	8	0	

Locale Element Key	Max Length	Type	Category
FORMATNAME_ DATE	512	0	
FORMATNAME_ DATETIME	512	0	
FORMATNAME_ TIME	512	0	
FORMATNAME_ NUMERIC	512	0	
FORMATNAME_ PERCENT	512	0	
FONT_SERIF	32	0	
FONT_SANSSERIF	32	0	
FONT_CURSIVE	32	0	
FONT_FANTASY	32	0	
FONT_ MONOSPACE	32	0	
BRUSH	32	0	
SIMPLEX	32	0	
COMPLEX	32	0	
SWISS	32	0	
ITALIC	32	0	
DATE_FORMAT	512	0	LC_TIME
DATE_SHORT_ FORMAT	512	0	LC_TIME
DATETIME_ AMPM_FORMAT	512	0	LC_TIME
DATETIME_ FORMAT	512	0	LC_TIME
DATETIME_ SHORT_FORMAT	512	0	LC_TIME
DATETIME_WEEK_ FORMAT	512	0	LC_TIME

Locale Element Key	Max Length	Type	Category
DATETIME_WEEK_ SHORT_FORMAT	512	0	LC_TIME
TIME_AMPM_ FORMAT	512	0	LC_TIME
TIME_FORMAT	512	0	LC_TIME
DATE_WEEK_ FORMAT	512	0	LC_TIME
DATE_WEEK_ SHORT_FORMAT	512	0	LC_TIME
DATE_YYMM_ FORMAT	512	0	LC_TIME
DATE_YYMM_ SHORT_FORMAT	512	0	LC_TIME
DATE_MMDD_ FORMAT	512	0	LC_TIME
DATE_MMDD_ SHORT_FORMAT	512	0	LC_TIME
DATE_YEAR_ FORMAT	512	0	LC_TIME
DATE_YEAR_ SHORT_FORMAT	512	0	LC_TIME
DATE_YYQQ_ FORMAT	512	0	LC_TIME
DATE_YYQQ_ SHORT_FORMAT	512	0	LC_TIME
DATE_YYWW_ FORMAT	512	0	LC_TIME
DATE_YYWW_ SHORT_FORMAT	512	0	LC_TIME
DATE_SEP	8	0	LC_TIME
ABMON01	512	0	LC_TIME
ABMON02	512	0	LC_TIME
ABMON03	512	0	LC_TIME
ABMON04	512	0	LC_TIME

Locale Element Key	Max Length	Type	Category
ABMON05	512	0	LC_TIME
ABMON06	512	0	LC_TIME
ABMON07	512	0	LC_TIME
ABMON08	512	0	LC_TIME
ABMON09	512	0	LC_TIME
ABMON10	512	0	LC_TIME
ABMON11	512	0	LC_TIME
ABMON12	512	0	LC_TIME
MON01	512	0	LC_TIME
MON02	512	0	LC_TIME
MON03	512	0	LC_TIME
MON04	512	0	LC_TIME
MON05	512	0	LC_TIME
MON06	512	0	LC_TIME
MON07	512	0	LC_TIME
MON08	512	0	LC_TIME
MON09	512	0	LC_TIME
MON10	512	0	LC_TIME
MON11	512	0	LC_TIME
MON12	512	0	LC_TIME
ABDAY1	512	0	LC_TIME
ABDAY2	512	0	LC_TIME
ABDAY3	512	0	LC_TIME
ABDAY4	512	0	LC_TIME
ABDAY5	512	0	LC_TIME
ABDAY6	512	0	LC_TIME

Locale Element Key	Max Length	Type	Category
ABDAY7	512	0	LC_TIME
DAY1	512	0	LC_TIME
DAY2	512	0	LC_TIME
DAY3	512	0	LC_TIME
DAY4	512	0	LC_TIME
DAY5	512	0	LC_TIME
DAY6	512	0	LC_TIME
DAY7	512	0	LC_TIME
AM	512	0	LC_TIME
PM	512	0	LC_TIME
ABQTR1	512	0	LC_TIME
ABQTR2	512	0	LC_TIME
ABQTR3	512	0	LC_TIME
ABQTR4	512	0	LC_TIME
QTR1	512	0	LC_TIME
QTR2	512	0	LC_TIME
QTR3	512	0	LC_TIME
QTR4	512	0	LC_TIME
INT_CURRENCY_ SYMBOL	3	0	LC_MONETARY
CURRENCY_ SYMBOL	32	0	LC_MONETARY
MON_DECIMAL_ POINT	8	0	LC_MONETARY
MON_ THOUSANDS_SEP	8	0	LC_MONETARY
MON_GROUPING	3	1	LC_MONETARY
MON_POSITIVE_ SIGN	8	0	LC_MONETARY

Locale Element Key	Max Length	Type	Category
MON_NEGATIVE_ SIGN	8	0	LC_MONETARY
MON_INT_FRAC_ DIGITS	3	1	LC_MONETARY
MON_FRAC_ DIGITS	3	1	LC_MONETARY
MON_P_CS_ PRECEDES	3	1	LC_MONETARY
MON_P_SEP_BY_ SPACE	3	1	LC_MONETARY
MON_P_SIGN_ POSN	3	1	LC_MONETARY
MON_N_SIGN_ POSN	3	1	LC_MONETARY
DECIMAL_POINT	1	0	LC_NUMERIC
THOUSANDS_SEP	1	0	LC_NUMERIC
GROUPING	3	1	LC_NUMERIC
POSITIVE_SIGN	8	0	LC_NUMERIC
NEGATIVE_SIGN	8	0	LC_NUMERIC
P_CS_PRECEDES	3	1	LC_NUMERIC
P_SEP_BY_SPACE	3	1	LC_NUMERIC
N_CS_PRECEDES	3	1	LC_NUMERIC
P_SEP_BY_SPACE	3	1	LC_NUMERIC
N_CS_PRECEDES	3	1	LC_NUMERIC
N_SEP_BY_SPACE	3	1	LC_NUMERIC
P_SIGN_POSN	3	1	LC_NUMERIC
N_SIGN_POSN	3	1	LC_NUMERIC
HEIGHT	3	1	
WIDTH	3	1	

Examples

Example 1

In the following locale example, the SETLOCALE function specifies the locale Japanese (jp_JP). The SETLOCALE function returns the previous locale. In this example, the previous locale was English_United States.

Statements	Results

`data_null;`
`x=setlocale('ja_JP);`
`put x=;`
`run;`
	`x=English_UnitedStates`

Example 2

In the following example, the SETLOCALE function returns the locale name where the element values are being changed:

Statements	Results

`data _null_;`
`x = setlocale("LC_MONETARY", 'zh_CN');`
`put x=; run;`
	`x=Japanese_Japan`

Example 3

In the following example, the SETLOCALE function changes the value of the specified key, DATE_YEAR_FORMAT:

Statements	Results

`data_null;`
`x=setlocale('DATE_YEAR_FORMAT', '¥%Y');`
`put x=;`
`run;`
	x=%Y¥

TRANTAB Function

Transcodes data by using the specified translation table.

Category: Character

Syntax

TRANTAB(*string,trantab_name*)

Required Arguments

string
input data that is transcoded.

trantab_name
translation table. Translation tables were introduced in SAS 6 to support the requirements of national languages. SAS 8.2 introduced the LOCALE= system option as an improvement on direct use of translation tables. SAS 9.2 supports the TRANTAB function for backward compatibility. However, using the LOCALE= system option is preferred in later SAS releases.

Details

The TRANTAB function transcodes a data string by using a translation table to remap the characters from one internal representation to another. The encoding of the data in the input string must match the encoding of table 1 in the translation table. The TRANTAB function remaps the data from the encoding using table 1.

CAUTION:
Only experienced SAS users should use the TRANTAB function.

Example

The following example uses a translation table that transcodes data that is encoded in Latin2 to an uppercase Latin2 encoding:

Statements	Result
`teststrg=trantab('testing','lat2_ucs');` `put teststrg;`	TESTING

See Also

Procedures:

- Chapter 17, “TRANTAB Procedure,” on page 533

UNICODE Function

converts Unicode characters to the current SAS session encoding.

Category: Character

Syntax

STR=**UNICODE**(<*instr*> (,<Unicode type>))

Required Arguments

str
Data string that has been converted to the current SAS session encoding.

instr
input data string.

Unicode type
Unicode character formats

ESC	Unicode Escape (for example, \u0042). ESC is the default format.
NCR	Numeric Character Representation (for example, &#22823 or &#177 ;)
PAREN	Unicode Parenthesis Escape (for example, <u0061>)
UCS2	UCS2 encoding with native endian.
UCS2B	UCS2 encoding with big endian.
UCS2L	UCS2 encoding with little endian.
UCS4	UCS4 encoding with native endian.
UCS4B	UCS4 encoding with big endian.
UCS4L	UCS4 encoding with little endian.
UTF16	UTF16 encoding with big endian.
UTF16B	UTF16 encoding with big endian.
UTF16L	UTF16 encoding with little endian.
UTF8	UTF8 encoding.

Details

This function reads Unicode characters and converts them to the current SAS session encoding.

Example

The following example demonstrates the functionality of the UNICODE function:

```
Examples: (Submitted under Little endian system.)
str1=unicode("\u0041\u0042\u0043");
str2=unicode("\0041\u0042\uu43",'esc');
str3=unicode("&# 177;", 'ncr');
str4=unicode("&# 22823;", 'ncr');
str5=unicode("<u0061><u0062>",'paren');
str6=unicode('2759'x,'ucs2');
str7=unicode('5927'x,'ucs2b');
str8=unicode('2759'x,'ucs21');
str9=unicode('27590000'x,'ucs4');
str10=unicode('00005927'x,'ucs4b');
str11=unicode('27590000'x,'ucs41') ;
str12=unicode('E5A4A7'x,'utf8');
str13=unicode('2759'x,'utf16') ;
str14=unicode('5927'x,'utf16b') ;
str15=unicode('2759'x,'utf161') ;

Results:
str1=ABC
str1=ABC
str3=±
str4=大
str5=ab
str6=大
str7=大
str8=大
str9=大
str10=大
str11=大
str12=大
str13=大
str14=大
str15=大
```

UNICODEC Function

converts characters in the current SAS session encoding to Unicode characters.

Category: Character

Syntax

STR=**UNICODEC**(<*instr*> (,<Unicode type>))

Required Arguments

str
data string that has been converted to Unicode encoding.

instr
input data string.

Unicode type
Unicode character formats

ESC	Unicode Escape (for example, \u0042) ESC is the default format.
NCR	Numeric Character Representation (for example, &#22823 or &#177 ;)
PAREN	Unicode Parenthesis Escape (for example, <u0061>)
UCS2	UCS2 encoding with native endian.
UCS2B	UCS2 encoding with big endian.
UCS2L	UCS2 encoding with little endian.
UCS4	UCS4 encoding with native endian.
UCS4B	UCS4 encoding with big endian.
UCS4L	UCS4 encoding with little endian.
UTF16	UTF16 encoding with big endian.
UTF16B	UTF16 encoding with big endian.
UTF16L	UTF16 encoding with little endian.
UTF8	UTF8 encoding.

Details

This function reads characters that are in the current SAS session encoding and converts them to Unicode encoding.

Example

The following example demonstrates the functionality of the UNICODEC function:

```
length str4 $20;
dai=unicode('\u5927');
str1=unicodec("ABC");
str2=unicodec("ABC",'esc');
str3=unicodec(dai, 'ncr');
str4=unicodec("ab",'paren');
str5=unicodec(dai, 'ucs2');
str6=unicodec(dai, 'ucs2b');
str7=unicodec(dai, 'ucs2l');
str8=unicodec(dai, 'ucs4');
str9=unicodec(dai, 'ucs4b');
str10=unicodec(dai, 'ucs4l');
str11=unicodec(dai, 'utf8');
str12=unicodec(dai, 'utf16');
str13=unicodec(dai, 'utf16b');
str14=unicodec(dai, 'utf16l');
Results:
str1=414243
str2=414243
str3=
str4=str5=2759
str6=5927
str7=2759
str8=27590000
str9=00005927
str10=27590000
```

```
str11=E5A4A7
str12=2759
str13=5927
str14=2759
```

UNICODELEN Function

specifies the length of the character unit for the Unicode data.

Category: Character

Syntax

UNICODELEN()

Details

The UNICODELEN function specifies the length of the character unit for the UNICODE data.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating system.

Statements	Results
`len1=unicodelen("abc夫");`	len1=4
`len2=unicodelen("\u0041\u0042\u0043\u5927",'esc')`	len2=4
`len3=unicodelen("&#22823;' ,'ncr');`	len3=1
`len4=unicodelen("<u0061><u0062>",'paren');`	len4=2

See Also

Functions:

- "UNICODEWIDTH Function" on page 318

UNICODEWIDTH Function

specifies the length of a display unit for the Unicode data.

Category: Character

Syntax

UNICODEWIDTH()

Details

The UNICODEWIDTH function specifies the length of a display unit for the Unicode data. The display unit displays the width of a character when the character is displayed with fixed width font. Characters between 0x3000 and 0x303F, 0x3400 and 0x4DFF, 0x4E00 and 0x9FFF, 0xF900 and 0xFAFF, inclusively, have the value of a display unit 2. Other characters are display unit 1.

Example

This example uses the Japanese Shift_JIS session encoding, which is supported under the UNIX operating system.

Statements	Results
`len1=unicodewidth("abc木");`	len1=5
`len2=unicodewidth("\u0041\u0042\u0043\u5927",'esc');`	len2=5
`len3=unicodewidth("&#22823; ",'ncr');`	len3=2
`len4=unicodewidth("<u0061><u0062>",'paren');`	len4=2

See Also

Functions:

- "UNICODELEN Function" on page 318

VARTRANSCODE Function

Returns the transcode attribute of a SAS data set variable.

Category: Variable Information

Syntax

VARTRANSCODE(*data-set-id*, *var-num*)

Required Arguments

data-set-id
specifies the data set identifier that the OPEN function returns.

var-num
specifies the position of the variable in the SAS data set.

Tip: The VARNUM function returns this value.

Details

Transcoding is the process of converting data from one encoding to another. The VARTRANSCODE function returns 0 if the *var-num* variable does not transcode its value, or 1 if the *var-num* variable transcodes its value.

For more information about transcoding variables, see Transcoding on page 27 in *SAS National Language Support (NLS): Reference Guide*. For information about encoding values and transcoding data, see SBCS, DBCS, and Unicode Encoding Values When Transcoding SAS Data on page 577 in *SAS National Language Support (NLS): Reference Guide*.

Example

The following example shows how to determine whether a character variable is transcoded:

```
data a;
   attrib x length=$3. transcode=no;
   attrib y length=$3. transcode=yes;
   x='abc';
   y='xyz';
run;
data _null_;
   dsid=open('work.a','i');
   nobs=attrn(dsid,"nobs");
   nvars=attrn(dsid,"nvars");
   do i=1 to nobs;
      xrc=fetch(dsid,1);
      do j=1 to nvars;
         transcode = vartranscode(dsid,j);
         put transcode=;
      end;
   end;
run;
```

SAS writes the following output to the log:

```
transcode=0
transcode=1
```

See Also

Functions:

- “ATTRN Function” in *SAS Functions and CALL Routines: Reference*
- “OPEN Function” in *SAS Functions and CALL Routines: Reference*
- “VARNUM Function” in *SAS Functions and CALL Routines: Reference*
- “VTRANSCODE Function” on page 321
- “VTRANSCODEX Function” on page 322

VTRANSCODE Function

Returns a value that indicates whether transcoding is enabled for the specified character variable.

Category: Variable Information

Syntax

VTRANSCODE (*var*)

Required Argument

var

specifies a character variable that is expressed as a scalar or as an array reference.

Restriction: You cannot use an expression as an argument.

Details

The VTRANSCODE function returns 0 if transcoding is off, and 1 if transcoding is on.

By default, all character variables in the DATA step are transcoded. You can use the TRANSCODE= attribute of the ATTRIB statement to turn transcoding off.

Comparisons

- The VTRANSCODE function returns a value that indicates whether transcoding is enabled for the specified variable. The VTRANSCODEX function, however, evaluates the argument to determine the variable name. The function then returns the transcoding status (on or off) that is associated with that variable name.
- The VTRANSCODE function does not accept an expression as an argument. The VTRANSCODEX function accepts expressions, but the value of the specified expression cannot denote an array reference.
- Related functions return the value of other variable attributes, such as the variable name, type, format, and length. For a list of the variable attributes, see the “Variable Information” functions in *SAS Functions and CALL Routines: Reference*.

Example

Statements	Result
	`----+----1----+`

`attrib x transcode = yes;`
`attrib y transcode = no;`
`rc1 = vtranscode(y);`
`put rc1=;`
	`rc1=0`

See Also

Functions:

- "VTRANSCODEX Function" on page 322

Statements:

- ATTRIB in

VTRANSCODEX Function

Returns a value that indicates whether transcoding is enabled for the specified argument.

Category: Variable Information

Syntax

VTRANSCODEX (*var*)

Required Argument

var

specifies any SAS character expression that evaluates to a character variable name.

Restriction: The value of the specified expression cannot denote an array reference.

Details

The VTRANSCODEX function returns 0 if transcoding is off, and 1 if transcoding is on.

By default, all character variables in the DATA step are transcoded. You can use the TRANSCODE= attribute of the ATTRIB statement to turn transcoding off.

Comparisons

- The VTRANSCODE function returns a value that indicates whether transcoding is enabled for the specified variable. The VTRANSCODEX function, however, evaluates the argument to determine the variable name. The function then returns the transcoding status (on or off) that is associated with that variable name.
- The VTRANSCODE function does not accept an expression as an argument. The VTRANSCODEX function accepts expressions, but the value of the specified expression cannot denote an array reference.
- Related functions return the value of other variable attributes, such as the variable name, type, format, and length. For a list of the variable attributes, see the "Variable Information" functions in *SAS Functions and CALL Routines: Reference*.

Example

Statements	Result
	`----+----1----+`

Statements	Result

`attrib x transcode = yes;`
`attrib y transcode = no;`
`rc1 = vtranscodex('y');`
`put rc1=;`
	`rc1=0`

See Also

Functions:

- “VTRANSCODE Function” on page 321

Statements:

- ATTRIB

Part 6

Informats for NLS

Chapter 12

Informat Entries

Informats by Category

There are six categories of SAS informats that support NLS:

Category	Description
BIDI text handling	Instructs SAS to read bidirectional data values from data variables.
Character	Instructs SAS to read character data values into character variables.
DBCS	Instructs SAS to manage various Asian languages.
Date and Time	Instructs SAS to read data values into variables that represent dates, times, and datetimes.
Hebrew text handling	Instructs SAS to read Hebrew data from data variables.
Numeric	Instructs SAS to read numeric data values into numeric variables.

The following table provides brief descriptions of the SAS informats. For more detailed descriptions, see the NLS entry for each informat.

Category	Language elements	Description
BIDI text handling	$LOGVSw. Informat (p. 344)	Reads a character string that is in left-to-right logical order, and then converts the character string to visual order.
	$LOGVSRw. Informat (p. 345)	Reads a character string that is in right-to-left logical order, and then converts the character string to visual order.
	$VSLOGw. Informat (p. 446)	Reads a character string that is in visual order, and then converts the character string to left-to-right logical order.
	$VSLOGRw. Informat (p. 447)	Reads a character string that is in visual order, and then converts the character string to right-to-left logical order.
Character	$REVERJw. Informat (p. 425)	Reads character data from right to left and preserves blanks.
	$REVERSw. Informat (p. 426)	Reads character data from right to left, and then left aligns the text.
	$UCS2Bw. Informat (p. 427)	Reads a character string that is encoded in big-endian, 16-bit, UCS2, Unicode encoding, and then converts the character string to the encoding of the current SAS session.
	$UCS2BEw. Informat (p. 428)	Reads a character string that is in the encoding of the current SAS session and then converts the character string to big-endian, 16-bit, UCS2, Unicode encoding.
	$UCS2Lw. Informat (p. 429)	Reads a character string that is encoded in little-endian, 16-bit, UCS2, Unicode encoding, and then converts the character string to the encoding of the current SAS session.
	$UCS2LEw. Informat (p. 430)	Reads a character string that is in the encoding of the current SAS session and then converts the character string to little-endian, 16-bit, UCS2, Unicode encoding.
	$UCS2Xw. Informat (p. 431)	Reads a character string that is encoded in 16-bit, UCS2, Unicode encoding, and then converts the character string to the encoding of the current SAS session.
	$UCS2XEw. Informat (p. 432)	Reads a character string that is in the encoding of the current SAS session and then converts the character string to 16-bit, UCS2, Unicode encoding.
	$UCS4Bw. Informat (p. 433)	Reads a character string that is encoded in big-endian, 32-bit, UCS4, Unicode encoding, and then converts the character string to the encoding of the current SAS session.
	$UCS4Lw. Informat (p. 434)	Reads a character string that is encoded in little-endian, 32-bit, UCS4, Unicode encoding, and then converts the character string to the encoding of the current SAS session.
	$UCS4Xw. Informat (p. 435)	Reads a character string that is encoded in 32-bit, UCS4, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category	Language elements	Description
	$UCS4XEw. Informat (p. 436)	Reads a character string that is in the encoding of the current SAS session, and then converts the character string to 32-bit, UCS4, Unicode encoding.
	$UESCw. Informat (p. 437)	Reads a character string that is encoded in UESC representation, and then converts the character string to the encoding of the current SAS session.
	$UESCEw. Informat (p. 438)	Reads a character string that is in the encoding of the current SAS session, and then converts the character string to UESC representation.
	$UNCRw. Informat (p. 439)	Reads an NCR character string, and then converts the character string to the encoding of the current SAS session.
	$UNCREw. Informat (p. 440)	Reads a character string in the encoding of the current SAS session, and then converts the character string to NCR.
	$UPARENw. Informat (p. 441)	Reads a character string that is encoded in UPAREN representation, and then converts the character string to the encoding of the current SAS session.
	$UPARENEw. Informat (p. 443)	Reads a character string that is in the encoding of the current SAS session, and then converts the character string to UPAREN representation.
	$UPARENPw. Informat (p. 444)	Reads a character string that is encoded in UPAREN representation, and then converts the character string to the encoding of the current SAS session, with national characters remaining in the encoding of the UPAREN representation.
	$UTF8Xw. Informat (p. 445)	Reads a character string that is encoded in UTF-8, and then converts the character string to the encoding of the current SAS session.
Date and Time	MINGUOw. Informat (p. 346)	Reads dates in Taiwanese format.
	NENGOw. Informat (p. 347)	Reads Japanese date values in the form eyymmdd.
	NLDATEw. Informat (p. 349)	Reads the date value in the specified locale, and then converts the date value to the local SAS date value.
	NLDATMw. Informat (p. 350)	Reads the datetime value of the specified locale, and then converts the datetime value to the local SAS datetime value.
	NLTIMAPw. Informat (p. 423)	Reads the time value and uses a.m. and p.m. in the specified locale, and then converts the time value to the local SAS time value.
	NLTIMEw. Informat (p. 424)	Reads the time value in the specified locale, and then converts the time value to the local SAS time value.
DBCS	$KANJIw. Informat (p. 342)	Removes shift code data from DBCS data.

Category	Language elements	Description
	$KANJIXw. Informat (p. 343)	Adds shift-code data to DBCS data.
Hebrew text handling	$CPTDWw. Informat (p. 337)	Reads a character string that is in Hebrew DOS (cp862) encoding, and then converts the character string to Windows (cp1255) encoding.
	$CPTWDw. Informat (p. 338)	Reads a character string that is in Windows (cp1255) encoding, and then converts the character string to Hebrew DOS (cp862) encoding.
Numeric	EUROw.d Informat (p. 339)	Reads numeric values, removes embedded characters in European currency, and reverses the comma and decimal point.
	EUROXw.d Informat (p. 340)	Reads numeric values and removes embedded characters in European currency.
	NLMNIAEDw.d Informat (p. 350)	Reads the monetary format of the international expression for the United Arab Emirates.
	NLMNIAUDw.d Informat (p. 351)	Reads the monetary format of the international expression for Australia.
	NLMNIBGNw.d Informat (p. 352)	Reads the monetary format of the international expression for Bulgaria.
	NLMNIBRLw.d Informat (p. 353)	Reads the monetary format of the international expression for Brazil.
	NLMNICADw.d Informat (p. 354)	Reads the monetary format of the international expression for Canada.
	NLMNICHFw.d Informat (p. 355)	Reads the monetary format of the international expression for Liechtenstein and Switzerland.
	NLMNICNYw.d Informat (p. 356)	Reads the monetary format of the international expression for China.
	NLMNICZKw.d Informat (p. 357)	Reads the monetary format of the international expression for the Czech Republic.
	NLMNIDKKw.d Informat (p. 358)	Reads the monetary format of the international expression for Denmark, Faroe Island, and Greenland.
	NLMNIEEKw.d Informat (p. 358)	Reads the monetary format of the international expression for Estonia.
	NLMNIEGPw.d Informat (p. 359)	Reads the monetary format of the international expression for Egypt.
	NLMNIEURw.d Informat (p. 360)	Reads the monetary format of the international expression for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.

Category	Language elements	Description
	NLMNIGBPw.d Informat (p. 361)	Reads the monetary format of the international expression for the United Kingdom.
	NLMNIHKDw.d Informat (p. 362)	Reads the monetary format of the international expression for Hong Kong.
	NLMNIHRKw.d Informat (p. 363)	Reads the monetary format of the international expression for Croatia.
	NLMNIHUFw.d Informat (p. 364)	Reads the monetary format of the international expression for Hungary.
	NLMNIIDRw.d Informat (p. 365)	Reads the monetary format of the international expression for Indonesia.
	NLMNIILSw.d Informat (p. 366)	Reads the monetary format of the international expression for Israel.
	NLMNIINRw.d Informat (p. 366)	Reads the monetary format of the international expression for India.
	NLMNIJPYw.d Informat (p. 367)	Reads the monetary format of the international expression for Japan.
	NLMNIKRWw.d Informat (p. 368)	Reads the monetary format of the international expression for South Korea.
	NLMNILTLw.d Informat (p. 369)	Reads the monetary format of the international expression for Lithuania.
	NLMNILVLw.d Informat (p. 370)	Reads the monetary format of the international expression for Latvia.
	NLMNIMOPw.d Informat (p. 371)	Reads the monetary format of the international expression for Macau.
	NLMNIMXNw.d Informat (p. 372)	Reads the monetary format of the international expression for Mexico.
	NLMNIMYRw.d Informat (p. 373)	Reads the monetary format of the international expression for Malaysia.
	NLMNINOKw.d Informat (p. 374)	Reads the monetary format of the international expression for Norway.
	NLMNINZDw.d Informat (p. 374)	Reads the monetary format of the international expression for New Zealand.
	NLMNIPLNw.d Informat (p. 375)	Reads the monetary format of the international expression for Poland.
	NLMNIRUBw.d Informat (p. 376)	Reads the monetary format of the international expression for Russia.

Category	Language elements	Description
	NLMNISEKw.d Informat (p. 377)	Reads the monetary format of the international expression for Sweden.
	NLMNISGDw.d Informat (p. 378)	Reads the monetary format of the international expression for Singapore.
	NLMNITHBw.d Informat (p. 379)	Reads the monetary format of the international expression for Thailand.
	NLMNITRYw.d Informat (p. 380)	Reads the monetary format of the international expression for Turkey.
	NLMNITWDw.d Informat (p. 381)	Reads the monetary format of the international expression for Taiwan.
	NLMNIUSDw.d Informat (p. 382)	Reads the monetary format of the international expression for Puerto Rico and the United States.
	NLMNIZARw.d Informat (p. 382)	Reads the monetary format of the international expression for South Africa.
	NLMNLAEDw.d Informat (p. 383)	Reads the monetary format of the local expression for the United Arab Emirates.
	NLMNLAUDw.d Informat (p. 384)	Reads the monetary format of the local expression for Australia.
	NLMNLBGNw.d Informat (p. 385)	Reads the monetary format of the local expression for Bulgaria.
	NLMNLBRLw.d Informat (p. 386)	Reads the monetary format of the local expression for Brazil.
	NLMNLCADw.d Informat (p. 387)	Reads the monetary format of the local expression for Canada.
	NLMNLCHFw.d Informat (p. 388)	Reads the monetary format of the local expression for Liechtenstein and Switzerland.
	NLMNLCNYw.d Informat (p. 389)	Reads the monetary format of the local expression for China.
	NLMNLCZKw.d Informat (p. 390)	Reads the monetary format of the local expression for the Czech Republic.
	NLMNLDKKw.d Informat (p. 390)	Reads the monetary format of the local expression for Denmark, the Faroe Island, and Greenland.
	NLMNLEEKw.d Informat (p. 391)	Reads the monetary format of the local expression for Estonia.
	NLMNLEGPw.d Informat (p. 392)	Reads the monetary format of the local expression for Egypt.

Category	Language elements	Description
	NLMNLEURw.d Informat (p. 393)	Reads the monetary format of the local expression for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.
	NLMNLGBPw.d Informat (p. 394)	Reads the monetary format of the local expression for the United Kingdom.
	NLMNLHKDw.d Informat (p. 395)	Reads the monetary format of the local expression for Hong Kong.
	NLMNLHRKw.d Informat (p. 396)	Reads the monetary format of the local expression for Croatia.
	NLMNLHUFw.d Informat (p. 397)	Reads the monetary format of the local expression for Hungary.
	NLMNLIDRw.d Informat (p. 398)	Reads the monetary format of the local expression for Indonesia.
	NLMNLILSw.d Informat (p. 398)	Reads the monetary format of the local expression for Israel.
	NLMNLINRw.d Informat (p. 399)	Reads the monetary format of the local expression for India.
	NLMNLJPYw.d Informat (p. 400)	Reads the monetary format of the local expression for Japan.
	NLMNLKRWw.d Informat (p. 401)	Reads the monetary format of the local expression for South Korea.
	NLMNLLTLw.d Informat (p. 402)	Reads the monetary format of the local expression for Lithuania.
	NLMNLLVLw.d Informat (p. 403)	Reads the monetary format of the local expression for Latvia.
	NLMNLMOPw.d Informat (p. 404)	Reads the monetary format of the local expression for Macau.
	NLMNLMXNw.d Informat (p. 405)	Reads the monetary format of the local expression for Mexico.
	NLMNLMYRw.d Informat (p. 406)	Reads the monetary format of the local expression for Malaysia.
	NLMNLNOKw.d Informat (p. 406)	Reads the monetary format of the local expression for Norway.
	NLMNLNZDw.d Informat (p. 407)	Reads the monetary format of the local expression for New Zealand.

Category	Language elements	Description
	NLMNLPLNw.d Informat (p. 408)	Reads the monetary format of the local expression for Poland.
	NLMNLRUBw.d Informat (p. 409)	Reads the monetary format of the local expression for Russia.
	NLMNLSEKw.d Informat (p. 410)	Reads the monetary format of the local expression for Sweden.
	NLMNLSGDw.d Informat (p. 411)	Reads the monetary format of the local expression for Singapore.
	NLMNLTHBw.d Informat (p. 412)	Reads the monetary format of the local expression for Thailand.
	NLMNLTRYw.d Informat (p. 413)	Reads the monetary format of the local expression for Turkey.
	NLMNLTWDw.d Informat (p. 414)	Reads the monetary format of the local expression for Taiwan.
	NLMNLUSDw.d Informat (p. 414)	Reads the monetary format of the local expression for Puerto Rico, and the United States.
	NLMNLZARw.d Informat (p. 415)	Reads the monetary format of the local expression for South Africa.
	NLMNYw.d Informat (p. 416)	Reads monetary data in the specified locale for the local expression, and then converts the data to a numeric value.
	NLMNYIw.d Informat (p. 417)	Reads monetary data in the specified locale for the international expression, and then converts the data to a numeric value.
	NLNUMw.d Informat (p. 419)	Reads numeric data in the specified locale for local expressions, and then converts the data to a numeric value.
	NLNUMIw.d Informat (p. 420)	Reads numeric data in the specified locale for international expressions, and then converts the data to a numeric value.
	NLPCTw.d Informat (p. 421)	Reads percentage data in the specified locale for local expressions, and then converts the data to a numeric value.
	NLPCTIw.d Informat (p. 422)	Reads percentage data in the specified locale for international expressions, and then converts the data to a numeric value.
	YENw.d Informat (p. 448)	Removes embedded yen signs, commas, and decimal points.

Dictionary

$CPTDW*w*. Informat

Reads a character string that is in Hebrew DOS (cp862) encoding, and then converts the character string to Windows (cp1255) encoding.

Category: Hebrew text handling

Syntax

$CPTDW*w*.

Syntax Description

w

specifies the width of the input field.

Default: 200

Range: 1–32000

Comparisons

The $CPTDW*w*. informat performs processing that is opposite of the $CPTWD*w*. informat.

Example

The following example uses the input value of 808182.

Statements	Result
	`----+----1----+`
`x=input('808182',$cptdw6.);` `put x;`	אבג

See Also

Formats:

- “$CPTDWw. Format” on page 87
- “$CPTWDw. Format” on page 88

Informat:

- “$CPTWDw. Informat” on page 338

$CPTWD*w*. Informat

Reads a character string that is in Windows (cp1255) encoding, and then converts the character string to Hebrew DOS (cp862) encoding.

Category: Hebrew text handling

Syntax

$CPTWD*w*.

Syntax Description

w

specifies the width of the input field.

Default: 200

Range: 1–32000

Comparisons

The $CPTWD*w*. informat performs processing that is opposite of the $CPTDW*w*. informat.

Example

The following example uses the input value of אבג.

Statements	Result
	`----+----1----+`
`x=input ('אבג',$cptwd6.);` `put x;`	€□,

See Also

Formats:

- “$CPTWDw. Format” on page 88
- “$CPTDWw. Format” on page 87

Informat:

- “$CPTDWw. Informat” on page 337

EURO*w.d* Informat

Reads numeric values, removes embedded characters in European currency, and reverses the comma and decimal point.

Category: Numeric

Syntax

EURO*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 6

Range: 1–32

d

specifies the power of 10 by which to divide the value. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The EURO*w.d* informat reads numeric values and removes embedded euro symbols (E), commas, blanks, percent signs, dashes, and close parentheses from the input data. A decimal point is assumed to be a separator between the whole number and the decimal portion. The EURO*w.d* informat converts an open parenthesis at the beginning of a field to a minus sign.

Comparisons

- The EURO*w.d* informat is similar to the EUROX*w.d* informat, but EUROX*w.d* reverses the roles of the decimal point and the comma. This convention is common in European countries.
- If no commas or periods appear in the input, then the EURO*w.d* and the EUROX*w.d* informats are interchangeable.

Example

The following table shows input values for currency in euros, the SAS statements that are applied, and the results.

```
data _null_;
   input x euro10.;
   put x=;
   datalines;
E1
E1.23
1.23
```

```
1,234.56
;
run;
SAS Log:
x=1
x=1.23
x=1.23
x=1234.56
```

Values	Statements	Results
		----+----1----2
E1	input x euro10.; put x;	1
E1.23	input x euro10.; put x;	1.23
1.23	input x euro10.; put x;	1.23
1,234.56	input x euro10.; put x;	1234.56

See Also

Formats:

- “EUROw.d Format” on page 89
- “EUROXw.d Format” on page 91

Informat:

- “EUROXw.d Informat” on page 340

EUROX*w.d* Informat

Reads numeric values and removes embedded characters in European currency.

Category: Numeric

Syntax

EUROX*w.d*

Syntax Description

w
specifies the width of the input field.

Default: 6

Range: 1–32

d

specifies the power of 10 by which to divide the value. If the data contains a comma, which represents a decimal point, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The EUROX*w.d* informat reads numeric values and removes embedded euro symbols (E), periods, blanks, percent signs, dashes, and close parentheses from the input data. A comma is assumed to be a separator between the whole number and the decimal portion. The EUROX*w.d* informat converts an open parenthesis at the beginning of a field to a minus sign.

Comparisons

- The EUROX*w.d* informat is similar to the EURO*w.d* informat, but EURO*w.d* reverses the roles of the comma and the decimal point. This convention is common in English-speaking countries.
- If no commas or periods appear in the input, the EUROX*w.d* and the EURO*w.d* informats are interchangeable.

Example

The following table shows input values for currency in euros, the SAS statements that are applied, and the results.

```
data _null_;
   input x eurox10.;
   put x=;
   datalines;
E1
E1.23
1.23
1,234.56
; run;
SAS Log:
7       input x eurox10.;
8       put x=;
9       datalines;
x=1
x=123
x=123
x=1.23456
```

Values	Statements	Results
		`----+----1----2`
`E1`	`input x eurox10.;` `put x;`	`1`

Values	Statements	Results
E1.23	input x eurox10.; put x;	123
1.23	input x eurox10.; put x;	123
1,234.56	input x eurox10.; put x;	1.23456

See Also

Formats:

- “EUROw.d Format” on page 89
- “EUROXw.d Format” on page 91

Informat:

- “EUROw.d Informat” on page 339

$KANJI*w*. Informat

Removes shift code data from DBCS data.

Category: DBCS

Syntax

$KANJI*w*.

Syntax Description

w

specifies the width of the input field.

Range: The minimum width for the informat is 2.

Restriction: The width must be an even number. If it is an odd number, it is truncated. The width must be equal to or greater than the length of the shift-code data.

Details

The $KANJI informat removes shift-code data from DBCS data. The $KANJI informat processes host-mainframe data. $KANJI can be used on other platforms. If you use the $KANJI informat on non-EBCDIC (non-modal encoding) hosts, the data does not change.

The data must start with SO and end with SI, unless single-byte blank data are returned. The input data length must be **`2 + (SO/SI length)*2`**.

See Also

Formats:

- "$KANJIw. Format" on page 96
- "$KANJIXw. Format" on page 96

Informat:

- "$KANJIXw. Informat" on page 343

$KANJIX*w*. Informat

Adds shift-code data to DBCS data.

Category: DBCS

Syntax

$KANJIX*w*.

Syntax Description

w

specifies the width of the input field.

Range: The minimum width for the informat is *2 + (length of shift code used on the current DBCSTYPE= setting)*2*.

Restriction: The width must be an even number. If it is an odd number, it is truncated. The width must be equal to or greater than the length of the shift-code data.

Details

The $KANJIX informat adds shift-code data to DBCS data that does not have shift-code data. If the input data is blank, shift-code data is not added. The $KANJIX informat processes host-mainframe data, but $KANJIX can be used on other platforms. If you use the $KANJIX informat on non-EBCDIC (non-modal encoding) hosts, the data does not change.

See Also

Formats:

- "$KANJIw. Format" on page 96
- "$KANJIXw. Format" on page 96

Informat:

- "$KANJIw. Informat" on page 342

$LOGVS*w*. Informat

Reads a character string that is in left-to-right logical order, and then converts the character string to visual order.

Category: BIDI text handling

Syntax

$LOGVS*w*.

Syntax Description

w
specifies the width of the input field.
Default: 200
Range: 1–32000

Comparisons

The $LOGVS*w*. informat performs processing that is opposite to the LOGVSR*w*. informat.

Example

The following example uses the Hebrew input value of "טיסה flight."

Statements	Result
	`----+----1----+`
x=input (' טיסה flight',$logvs12.); `put x;`	טיסה flight

The following example uses the Arabic input value of " تاذ computer."

Statements	Result
	`----+----1----+`
x=input (' تاذ computer',$logvs12.); `put x;`	تاذ computer

See Also

Formats:

- "$LOGVSRw. Format" on page 99
- "$LOGVSw. Format" on page 97

Informat:

- "$LOGVSRw. Informat" on page 345

$LOGVSR*w*. Informat

Reads a character string that is in right-to-left logical order, and then converts the character string to visual order.

Category: BIDI text handling

Syntax

$LOGVSR*w*.

Syntax Description

w

specifies the width of the input field.

Default: 200

Range: 1–32000

Comparisons

The $LOGVSR*w*. informat performs processing that is opposite to the $LOGVS*w*. informat.

Example

The following example uses the Hebrew input value of "טיסה flight."

Statements	Results
	`----+----1----+`
x=input (' טיסה flight',$logvsr12.); `put x;`	flight הסיט

The following example uses the Arabic input value of "تاذ computer."

Statements	Results
	`----+----1----+`
x=input (' ذ|ات computer',$logvsr12.); `put x;`	ذ|ات computer

See Also

Formats:

- “$LOGVSw. Format” on page 97
- “$LOGVSRw. Format” on page 99

Informat:

- “$LOGVSw. Informat” on page 344

MINGUO*w*. Informat

Reads dates in Taiwanese format.

Category: Date and Time

Syntax

MINGUO*w*.

Syntax Description

w
specifies the width of the input field.
Default: 6
Range: 6–10

Details

The general form of a Taiwanese date is *yyyymmdd*:

yyyy
is an integer that represents the year.

mm
is an integer from 01 through 12 that represents the month.

dd
is an integer from 01 through 31 that represents the day of the month.

The Taiwanese calendar uses 1912 as the base year (01/01/01 is January 1, 1912). Dates before 1912 are not valid. Year values do not roll over after 100 years; instead, they continue to increase.

You can separate the year, month, and day values with any delimiters, such as blanks, slashes, or dashes, that are permitted by the YYMMDD*w*. informat. If delimiters are used, place them between all the values. If you omit delimiters, be sure to use a leading zero for days or months that have a value less than 10.

Example

The following examples use different dates for input values.

```
input date minguo10.;
put date date9.;
```

```
data _null_;
  input date minguo10.;
  put date date9.;
  datalines;
49/01/01
891215
03-01-01
;
```

Values	Results
	----+----1----+
49/01/01	01JAN1960
891215	15DEC2000
103-01-01	01JAN2014

See Also

Format:

- “MINGUOw. Format” on page 100

Informat:

- “YYMMDDw. Informat” in *SAS Formats and Informats: Reference*

NENGO*w*. Informat

Reads Japanese date values in the form *eyymmdd*.

Category: Date and Time

Syntax

NENGO*w*.

Syntax Description

w
specifies the width of the input field.

Default: 10

Range: 7–32

Details

The general form of a Japanese date is *eyymmdd*:

e
is the first letter of the name of the imperial era(Meiji, Taisho, Showa, or Heisei).

yy
is an integer that represents the year.

mm
is an integer from 01 through 12 that represents the month.

dd
is an integer from 01 through 31 that represents the day of the month.

The *e* value can be separated from the integers by a period. If you omit *e*, SAS uses the current imperial era. You can separate the year, month, and day values by blanks or any nonnumeric character. However; if delimiters are used, place them between all the values. If you omit delimiters, be sure to use a leading zero for days or months that are values less than 10.

Example

The following examples use different input values.

```
input nengo_date nengo8.;
put nengo_date date9.;
```

```
data _null_;
   input nengo_date nengo8.;
   put nengo_date date9.;
   put nengo_date= ;
   datalines;
h11108
h.11108
11/10/08
;
```

Values	Results
	----+----1----+
h11108	08OCT1999
h.11108	08OCT1999
11/10/08	08OCT1999

See Also

Formats:

- "NENGOw. Format" on page 101

NLDATE*w*. Informat

Reads the date value in the specified locale, and then converts the date value to the local SAS date value.

Category: Date and Time

Syntax

NLDATE*w*.

Syntax Description

w
specifies the width of the input field.
Default: 20
Range: 10–200

Example

The following examples use the input February 24, 2003.

Statements	Results
	`----+----1----+`

`options locale=English_UnitedStates;`
`dy='February 24, 2003';`
`y=input('dy,nldate200.);`
`put y=;`
	`15760`

`options locale=German_Germany;`
`dy='24. Februar 2003';`
`y=input(dy,nldate16.);`
`put y=;`
	`15760`

See Also

Format:

- "NLDATEw. Format" on page 104

NLDATM*w*. Informat

Reads the datetime value of the specified locale, and then converts the datetime value to the local SAS datetime value.

Category: Date and Time

Syntax

NLDATM*w*.

Syntax Description

w

specifies the width of the input field.

Default: 30

Range: 10–200

Example

The following examples use the input value of February 24, 2003 12:39:43.

Statements	Results
	`----+----1----+`

`options locale=English_UnitedStates;`
`y=input('24.Feb03:12:39:43', nldatm.);`
`put y=;`
	`1361709583`

`options locale=German_Germany;`
`y=input('24.Februar 2003 12.39 Uhr', nldatm.);`
`put y=;`
	`1330171200`

See Also

Format:

- "NLDATMw. Format" on page 113

NLMNIAED*w.d* Informat

Reads the monetary format of the international expression for the United Arab Emirates.

Category: Numeric

Alignment: left

Syntax

NLMNIAED*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniaed32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNLAEDw.d Informat" on page 383

NLMNIAUD*w.d* Informat

Reads the monetary format of the international expression for Australia.

Category: Numeric

Alignment: left

Syntax

NLMNIAUD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniaud32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLAUDw.d Informat" on page 384

NLMNIBGN*w.d* Informat

Reads the monetary format of the international expression for Bulgaria.

Category: Numeric

Alignment: left

Syntax

NLMNIBGN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=put('(-1234.56789)',nlmnibgn32.2);
y=put('(-1234.56789)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLBGNw.d Informat" on page 385

NLMNIBRL*w.d* Informat

Reads the monetary format of the international expression for Brazil.

Category: Numeric

Alignment: left

Syntax

NLMNIBRL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnibrl32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNLBRLw.d Informat" on page 386

NLMNICAD*w.d* Informat

Reads the monetary format of the international expression for Canada.

Category: Numeric

Alignment: left

Syntax

NLMNICAD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnicad32.2);
y=input'($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNICADw.d Format" on page 129

NLMNICHF*w.d* Informat

Reads the monetary format of the international expression for Liechtenstein and Switzerland.

Category: Numeric

Alignment: left

Syntax

NLMNICHF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnichf32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNICHFw.d Format" on page 130

NLMNICNY*w.d* Informat

Reads the monetary format of the international expression for China.

Category: Numeric

Alignment: left

Syntax

NLMNICNY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnicny32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNICNYw.d Format" on page 131

NLMNICZK*w.d* Informat

Reads the monetary format of the international expression for the Czech Republic.

Category: Numeric

Alignment: left

Syntax

NLMNICZK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniczk32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLCZKw.d Informat" on page 390

NLMNIDKK*w.d* Informat

Reads the monetary format of the international expression for Denmark, Faroe Island, and Greenland.

Category: Numeric

Alignment: left

Syntax

NLMNIDKK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmndkk32.2);
y=input'($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNIDKKw.d Format” on page 133

NLMNIEEK*w.d* Informat

Reads the monetary format of the international expression for Estonia.

Category: Numeric

Alignment: left

Syntax

NLMNIEEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnieek32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNLEEKw.d Informat" on page 391

NLMNIEGP*w.d* Informat

Reads the monetary format of the international expression for Egypt.

Category: Numeric

Alignment: left

Syntax

NLMNIEGP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniegp32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLEGPw.d Informat" on page 392

NLMNIEUR*w.d* Informat

Reads the monetary format of the international expression for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.

Category: Numeric

Alignment: left

Syntax

NLMNIEUR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnieur32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNIEURw.d Format" on page 135

NLMNIGBP*w.d* Informat

Reads the monetary format of the international expression for the United Kingdom.

Category: Numeric

Alignment: left

Syntax

NLMNIGBP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnigbp32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNIGBPw.d Format" on page 136

NLMNIHKD*w.d* Informat

Reads the monetary format of the international expression for Hong Kong.

Category: Numeric

Alignment: left

Syntax

NLMNIHKD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnihkd32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNIHKDw.d Format" on page 137

NLMNIHRK*w.d* Informat

Reads the monetary format of the international expression for Croatia.

Category: Numeric

Alignment: left

Syntax

NLMNIHRK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnihrk32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLHRKw.d Informat" on page 396

NLMNIHUF*w.d* Informat

Reads the monetary format of the international expression for Hungary.

Category: Numeric

Alignment: left

Syntax

NLMNIHUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnihuf32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLHUFw.d Informat" on page 397

NLMNIIDR*w.d* Informat

Reads the monetary format of the international expression for Indonesia.

Category: Numeric

Alignment: left

Syntax

NLMNIIDR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniidr32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informats:

- "NLMNLIDRw.d Informat" on page 398

NLMNIILS*w.d* Informat

Reads the monetary format of the international expression for Israel.

Category: Numeric

Alignment: left

Syntax

NLMNIILS*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmniils32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNIILSw.d Format” on page 141

NLMNIINR*w.d* Informat

Reads the monetary format of the international expression for India.

Category: Numeric

Alignment: left

Syntax

NLMNIINR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniinr32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLINRw.d Informat" on page 399

NLMNIJPY*w.d* Informat

Reads the monetary format of the international expression for Japan.

Category: Numeric

Alignment: left

Syntax

NLMNIJPY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnijpy32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNIJPYw.d Format" on page 142

NLMNIKRW*w.d* Informat

Reads the monetary format of the international expression for South Korea.

Category: Numeric

Alignment: left

Syntax

NLMNIKRW*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnikrw32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLKRWw.d Informat" on page 401

NLMNILTL*w.d* Informat

Reads the monetary format of the international expression for Lithuania.

Category: Numeric

Alignment: left

Syntax

NLMNILTL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmniltl32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNLLTLw.d Informat" on page 402

NLMNILVL*w.d* Informat

Reads the monetary format of the international expression for Latvia.

Category: Numeric

Alignment: left

Syntax

NLMNILVL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnilvl32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNLLVLw.d Informat" on page 403

NLMNIMOP*w.d* Informat

Reads the monetary format of the international expression for Macau.

Category: Numeric

Alignment: left

Syntax

NLMNIMOP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnimop32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLMOPw.d Informat" on page 404

NLMNIMXN*w.d* Informat

Reads the monetary format of the international expression for Mexico.

Category: Numeric

Alignment: left

Syntax

NLMNIMXN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnimxn32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLMXNw.d Informat" on page 405

NLMNIMYR*w.d* Informat

Reads the monetary format of the international expression for Malaysia.

Category: Numeric

Alignment: left

Syntax

NLMNIMYR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input{'($12,345.67)',nlmnimyr32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNIMYRw.d Format" on page 148

NLMNINOK*w.d* Informat

Reads the monetary format of the international expression for Norway.

Category: Numeric

Alignment: left

Syntax

NLMNINOK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmninok32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNINOKw.d Format” on page 149

NLMNINZD*w.d* Informat

Reads the monetary format of the international expression for New Zealand.

Category: Numeric

Alignment: left

Syntax

NLMNINZD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmninzd32.2);
y=input'($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNINZDw.d Format" on page 150

NLMNIPLN*w.d* Informat

Reads the monetary format of the international expression for Poland.

Category: Numeric

Alignment: left

Syntax

NLMNIPLN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnipln32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNIPLNw.d Format" on page 150

NLMNIRUB*w.d* Informat

Reads the monetary format of the international expression for Russia.

Category: Numeric

Alignment: left

Syntax

NLMNIRUB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnirub32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNIRUBw.d Format" on page 151

NLMNISEK*w.d* Informat

Reads the monetary format of the international expression for Sweden.

Category: Numeric

Alignment: left

Syntax

NLMNISEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnisek32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNISEKw.d Format" on page 152

NLMNISGD*w.d* Informat

Reads the monetary format of the international expression for Singapore.

Category: Numeric

Alignment: left

Syntax

NLMNISGD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnisgd32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNISGDw.d Format" on page 153

NLMNITHB*w.d* Informat

Reads the monetary format of the international expression for Thailand.

Category: Numeric

Alignment: left

Syntax

NLMNITHB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnithb32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLTHBw.d Informat" on page 412

NLMNITRY*w.d* Informat

Reads the monetary format of the international expression for Turkey.

Category: Numeric

Alignment: left

Syntax

NLMNITRY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnitry32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNLTRYw.d Informat" on page 413

NLMNITWD*w.d* Informat

Reads the monetary format of the international expression for Taiwan.

Category: Numeric

Alignment: left

Syntax

NLMNITWD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnitwd32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNITWDw.d Format" on page 156

NLMNIUSD*w.d* Informat

Reads the monetary format of the international expression for Puerto Rico and the United States.

Category: Numeric

Alignment: left

Syntax

NLMNIUSD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmniusd32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNIUSDw.d Format” on page 157

NLMNIZAR*w.d* Informat

Reads the monetary format of the international expression for South Africa.

Category: Numeric

Alignment: left

Syntax

NLMNIZAR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input'($12,345.67)',nlmnizar32.2);
y=input'($12,345.67)'dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNIZARw.d Format" on page 158

NLMNLAED*w.d* Informat

Reads the monetary format of the local expression for the United Arab Emirates.

Category: Numeric

Alignment: left

Syntax

NLMNLAED*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlaed32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- “NLMNIAEDw.d Informat” on page 350

NLMNLAUD*w.d* Informat

Reads the monetary format of the local expression for Australia.

Category: Numeric

Alignment: left

Syntax

NLMNLAUD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlaud32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLAUDw.d Format" on page 159

NLMNLBGN*w.d* Informat

Reads the monetary format of the local expression for Bulgaria.

Category: Numeric

Alignment: left

Syntax

NLMNLBGN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input(-12345.67,nlmnlbgn32.2);
y=input(-12345.67,dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNIBGNw.d Informat" on page 352

NLMNLBRL*w.d* Informat

Reads the monetary format of the local expression for Brazil.

Category: Numeric

Alignment: left

Syntax

NLMNLBRL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlbrl32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNIBRLw.d Informat" on page 353

NLMNLCAD*w.d* Informat

Reads the monetary format of the local expression for Canada.

Category: Numeric

Alignment: left

Syntax

NLMNLCAD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlcad32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLCADw.d Format" on page 162

NLMNLCHF*w.d* Informat

Reads the monetary format of the local expression for Liechtenstein and Switzerland.

Category: Numeric

Alignment: left

Syntax

NLMNLCHF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlchf32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLCHFw.d Format" on page 163

NLMNLCNY*w.d* Informat

Reads the monetary format of the local expression for China.

Category: Numeric

Alignment: left

Syntax

NLMNLCNY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlcny32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLCNYw.d Format" on page 164

NLMNLCZK*w.d* Informat

Reads the monetary format of the local expression for the Czech Republic.

Category: Numeric

Alignment: left

Syntax

NLMNLCZK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlczk32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- “NLMNICZKw.d Informat” on page 357

NLMNLDKK*w.d* Informat

Reads the monetary format of the local expression for Denmark, the Faroe Island, and Greenland.

Category: Numeric

Alignment: left

Syntax

NLMNLDKK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnldkk32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLDKKw.d Format" on page 166

NLMNLEEK*w.d* Informat

Reads the monetary format of the local expression for Estonia.

Category: Numeric

Alignment: left

Syntax

NLMNLEEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnleek32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- “NLMNIEEKw.d Informat” on page 358

NLMNLEGP*w.d* Informat

Reads the monetary format of the local expression for Egypt.

Category: Numeric

Alignment: left

Syntax

NLMNLEGP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlegp32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNIEGPw.d Informat" on page 359

NLMNLEUR*w.d* Informat

Reads the monetary format of the local expression for Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovenia, and Spain.

Category: Numeric

Alignment: left

Syntax

NLMNLEUR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnleur32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNLEURw.d Format" on page 168

NLMNLGBP*w.d* Informat

Reads the monetary format of the local expression for the United Kingdom.

Category: Numeric

Alignment: left

Syntax

NLMNLGBP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlgbp32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNLGBPw.d Format" on page 169

NLMNLHKD*w.d* Informat

Reads the monetary format of the local expression for Hong Kong.

Category: Numeric

Alignment: left

Syntax

NLMNLHKD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlhkd32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLHKDw.d Format" on page 170

NLMNLHRK*w.d* Informat

Reads the monetary format of the local expression for Croatia.

Category: Numeric

Alignment: left

Syntax

NLMNLHRK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlhrk32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-1,234.57`

See Also

Informat:

- "NLMNIHRKw.d Informat" on page 363

NLMNLHUF*w.d* Informat

Reads the monetary format of the local expression for Hungary.

Category: Numeric

Alignment: left

Syntax

NLMNLHUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlhuf32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNIHUFw.d Informat" on page 364

NLMNLIDR*w.d* Informat

Reads the monetary format of the local expression for Indonesia.

Category: Numeric

Alignment: left

Syntax

NLMNLIDR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlidr32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- “NLMNIIDRw.d Informat” on page 365

NLMNLILS*w.d* Informat

Reads the monetary format of the local expression for Israel.

Category: Numeric

Alignment: left

Syntax

NLMNLILS*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlils32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLILSw.d Format" on page 174

NLMNLINR*w.d* Informat

Reads the monetary format of the local expression for India.

Category: Numeric

Alignment: left

Syntax

NLMNLINR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlinr32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNIINRw.d Informat" on page 366

NLMNLJPY*w.d* Informat

Reads the monetary format of the local expression for Japan.

Category: Numeric

Alignment: left

Syntax

NLMNLJPY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnljpy32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLJPYw.d Format" on page 175

NLMNLKRW*w.d* Informat

Reads the monetary format of the local expression for South Korea.

Category: Numeric

Alignment: left

Syntax

NLMNLKRW*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlkrw32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNIKRWw.d Informat" on page 368

NLMNLLTL*w.d* Informat

Reads the monetary format of the local expression for Lithuania.

Category: Numeric

Alignment: left

Syntax

NLMNLLTL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlltl32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Informat:

- "NLMNILTLw.d Informat" on page 369

NLMNLLVL*w.d* Informat

Reads the monetary format of the local expression for Latvia.

Category: Numeric

Alignment: left

Syntax

NLMNLLVL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnllvl32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNILVLw.d Informat" on page 370

NLMNLMOP*w.d* Informat

Reads the monetary format of the local expression for Macau.

Category: Numeric

Alignment: left

Syntax

NLMNLMOP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlmop32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNIMOPw.d Informat" on page 371

NLMNLMXN*w.d* Informat

Reads the monetary format of the local expression for Mexico.

Category: Numeric

Alignment: left

Syntax

NLMNLMXN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlmxn32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNIMXNw.d Informat" on page 372

NLMNLMYR*w.d* Informat

Reads the monetary format of the local expression for Malaysia.

Category: Numeric

Alignment: left

Syntax

NLMNLMYR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlmyr32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNLMYRw.d Format” on page 181

NLMNLNOK*w.d* Informat

Reads the monetary format of the local expression for Norway.

Category: Numeric

Alignment: left

Syntax

NLMNLNOK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlnok32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLNOKw.d Format" on page 182

NLMNLNZD*w.d* Informat

Reads the monetary format of the local expression for New Zealand.

Category: Numeric

Alignment: left

Syntax

NLMNLNZD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlnzd32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLNZDw.d Format" on page 182

NLMNLPLN*w.d* Informat

Reads the monetary format of the local expression for Poland.

Category: Numeric

Alignment: left

Syntax

NLMNLPLN*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlpln32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLPLNw.d Format" on page 183

NLMNLRUB*w.d* Informat

Reads the monetary format of the local expression for Russia.

Category: Numeric

Alignment: left

Syntax

NLMNLRUB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlrub32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLRUBw.d Format" on page 184

NLMNLSEK*w.d* Informat

Reads the monetary format of the local expression for Sweden.

Category: Numeric

Alignment: left

Syntax

NLMNLSEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlsek32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+
put x=;	-12345.67
put y=;	-12345.67

See Also

Format:

- "NLMNLSEKw.d Format" on page 185

NLMNLSGD*w.d* Informat

Reads the monetary format of the local expression for Singapore.

Category: Numeric

Alignment: left

Syntax

NLMNLSGD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlsgd32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	----+----1----+

Statements	Results
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLSGDw.d Format" on page 186

NLMNLTHB*w.d* Informat

Reads the monetary format of the local expression for Thailand.

Category: Numeric

Alignment: left

Syntax

NLMNLTHB*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlthb32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNITHBw.d Informat" on page 379

NLMNLTRY*w.d* Informat

Reads the monetary format of the local expression for Turkey.

Category: Numeric

Alignment: left

Syntax

NLMNLTRY*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnltry32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Informat:

- "NLMNITRYw.d Informat" on page 380

NLMNLTWD*w.d* Informat

Reads the monetary format of the local expression for Taiwan.

Category: Numeric

Alignment: left

Syntax

NLMNLTWD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnltwd32.2);
y=input('($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNLTWDw.d Format” on page 189

NLMNLUSD*w.d* Informat

Reads the monetary format of the local expression for Puerto Rico, and the United States.

Category: Numeric

Alignment: left

Syntax

NLMNLUSD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlusd32.2);
y=input'($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- "NLMNLUSDw.d Format" on page 190

NLMNLZAR*w.d* Informat

Reads the monetary format of the local expression for South Africa.

Category: Numeric

Alignment: left

Syntax

NLMNLZAR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 9

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal points, the *d* value is ignored.

Default: 0

Range: 0–31

Example

In the following example, the LOCALE= system option is set to English_UnitedStates.

```
x=input('($12,345.67)',nlmnlzar32.2);
y=input'($12,345.67)',dollar32.2);
```

Statements	Results
	`----+----1----+`
`put x=;`	`-12345.67`
`put y=;`	`-12345.67`

See Also

Format:

- “NLMNLZARw.d Format” on page 190

NLMNY*w.d* Informat

Reads monetary data in the specified locale for the local expression, and then converts the data to a numeric value.

Category: Numeric

Syntax

NLMNY*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 9

Range: 1–32

d

optionally specifies whether to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLMNY*w.d* informat reads monetary data in the specified locale for the local expression, and then converts the data to a numeric value. It removes any thousands separators, decimal separators, blanks, the currency symbol, and the close parenthesis from the input data.

Comparisons

The NLMNY*w.d* informat performs processing that is the opposite of the NLMNYI*w.d* informat.

The NLMNY*w.d* informat is similar to the DOLLAR*w.d* informat except that the NLMNY*w.d* informat is locale-specific.

Example

The following examples use the input value of $12,345.67.

Statements	Results
	`----+----1----+`
`options LOCALE=English_UnitedStates;`	`-12345.67`
`x=input('($12,345.67)',nlmny32.2);`	`-12345.67`
`y=input('($12,345.67)',dollar32.2);`	
`put x=;`	
`put y=;`	

See Also

Formats:

- “NLMNYw.d Format” on page 191
- “NLMNYIw.d Format” on page 193

Informat:

- “NLMNYIw.d Informat” on page 417

NLMNYI*w.d* Informat

Reads monetary data in the specified locale for the international expression, and then converts the data to a numeric value.

Category: Numeric

Syntax

NLMNYI*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 9

Range: 1–32

d

optionally specifies whether to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLMNYI*w.d* informat reads monetary data in the specified locale for the international expression, and then converts the data to a numeric value. It removes any thousands separators, decimal separators, blanks, the currency symbol, and the close parenthesis from the input data.

Comparisons

The NLMNYI*w.d* informat performs processing that is the opposite of the NLMNY*w.d* informat.

Example

The following examples use the input value of 12,345.67.

Statements	Results
	`----+----1----+`
`options LOCALE=English_UnitedStates;`	`-12345.67`
`x=input('(USD12,345.67)',nlmnyi32.2);`	`-12345.67`
`y=input('$-12,345.67)',dollar32.2);`	
`put x=;`	
`put y=;`	

See Also

Formats:

- “NLMNYw.d Format” on page 191
- “NLMNYIw.d Format” on page 193

Informat:

- "NLMNYw.d Informat" on page 416

NLNUM*w.d* Informat

Reads numeric data in the specified locale for local expressions, and then converts the data to a numeric value.

Category: Numeric

Syntax

NLNUM*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 6

Range: 1–32

d

optionally specifies whether to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLNUM*w.d*) informat reads numeric data in the specified locale for local expressions, and then converts the data to a numeric value. It removes any thousands separators, decimal separators, blanks, the currency symbol, and the close parenthesis from the input data.

Comparisons

The NLNUM*w.d* informat performs processing that is opposite to the NLNUMI*w.d* informat.

Example

The following example uses –1234356.78 as the input value.

Statements	Results
	`----+----1----+`

`options locale=English_UnitedStates;`
`x=input('-1,234,356.78',nlnum32.2);`
`put x=;`
	`-1234356.78`

See Also

Formats:

- "NLNUMw.d Format" on page 194
- "NLMNYIw.d Format" on page 193

Informat:

- "NLNUMIw.d Informat" on page 420

NLNUMI*w.d* Informat

Reads numeric data in the specified locale for international expressions, and then converts the data to a numeric value.

Category: Numeric

Syntax

NLNUMI*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 6

Range: 1–32

d

optionally specifies to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLNUMI*w.d* informat reads numeric data in the specified locale for international expressions, and then converts the data to a numeric value. It removes any thousands separators, decimal separators, blanks, the currency symbol, and the close parenthesis from the input data.

Comparisons

The NLNUMI*w.d* informat performs processing that is opposite to the NLNUM*w.d* informat.

Example

The following example uses –1,234,356.78 as the input value.

Statements	Results
	----+----1----+

options locale=English_UnitedStates;
x=input('-1,234,356.78', nlnumi32.2);
put x=;
	-1234356.78

See Also

Formats:

- “NLNUMw.d Format” on page 194
- “NLNUMIw.d Format” on page 195
- “NLNUMw.d Informat” on page 419

NLPCT*w.d* Informat

Reads percentage data in the specified locale for local expressions, and then converts the data to a numeric value.

Category: Numeric

Syntax

NLPCT*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 6

Range: 1–32

d

optionally specifies whether to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLPCT*w.d* informat reads percentage data in the specified locale for local expressions, and then converts the data to a numeric value. It divides the value by 100 and removes any thousands separators, decimal separators, blanks, the percent sign, and the close parenthesis from the input data.

Comparisons

The NLPCT*w.d* informat performs processing that is opposite of the NLPCTI*w.d* informat. The NLPCT*w.d* informat is similar to the PERCENT*w.d* informat except that the NLPCT*w.d* informat is locale-specific.

Example

The following example uses –12,345.67% as the input value.

Statements	Result
	`----+----1----+`
`options LOCALE=English_UnitedStates;`	`-123.4567`
`x=input('-12,345.67%',nlpct32.2);`	`-123.4567`
`y=input('(12,345.67%)',percent32.2);`	
`put x=;`	
`put y=;`	

See Also

Formats:

- “NLPCTw.d Format” on page 197
- “NLPCTIw.d Format” on page 198
- “NLPCTIw.d Informat” on page 422

NLPCTI*w.d* Informat

Reads percentage data in the specified locale for international expressions, and then converts the data to a numeric value.

Category: Numeric

Syntax

NLPCTI*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 6

Range: 1–32

d

optionally specifies whether to divide the number by 10^d. If the data contains decimal separators, the *d* value is ignored.

Default: 0

Range: 0–31

Details

The NLPCTI*w.d* informat reads percentage data in the specified locale for international expressions, and then converts the data to a numeric value. It divides the value by 100 and removes any thousands separators, decimal separators, blanks, the percent sign, and the close parentheses from the input data.

Comparisons

The NLPCTI*w.d* informat performs processing that is opposite of the NLPCT*w.d* informat.

Example

The following example uses -12,345.67% as the input value.

Statements	Results
	`----+----1----+`
`options LOCALE=English_UnitedStates;`	`-123.4567`
`x=input('-12,345.67%',nlpct32.2);`	`-123.4567`
`y=input('(12,345.67%)',percent32.2);`	
`put x=;`	
`put y=;`	

See Also

Formats:

- “NLPCTw.d Format” on page 197
- “NLPCTIw.d Format” on page 198

Informat:

- “NLPCTw.d Informat” on page 421

NLTIMAP*w*. Informat

Reads the time value and uses a.m. and p.m. in the specified locale, and then converts the time value to the local SAS time value.

Category: Date and Time

Syntax

NLTIMAP*w*.

Syntax Description

w
specifies the width of the input field.
Default: 10
Range: 4–200

Example

The following example uses 04:24:43 p.m. as the input value.

Statements	Results
	`----+----1----+`

`options locale=English_UnitedStates;`
`y=input('04:24:43 PM',nltimap11.);`
`put y time.;`
	`16:24:43`

`options locale=German_Germany;`
`y=input('16.24 Uhr',nltimap11.);`
`put y time.;`
	`16:24:00`

See Also

Format:

- "NLTIMAPw. Format" on page 205

NLTIME*w*. Informat

Reads the time value in the specified locale, and then converts the time value to the local SAS time value.

Category: Date and Time

Syntax

NLTIME*w*.

Syntax Description

w
specifies the width of the input field.
Default: 20
Range: 10–200

Example

The following example uses 16:24:43 as the input value.

Statements	Results
	----+----1----+

options locale=English_UnitedStates;
y=input('16:24:43',nltime.);
put y time.;
	16:24:43

options locale=German_Germany;
y=input('16.24 Uhr',nltime.);
put y time.;
	16:24:00

See Also

Format:

- "NLTIMEw. Format" on page 206

$REVERJ*w*. Informat

Reads character data from right to left and preserves blanks.

Category: Character

Syntax

$REVERJ*w*.

Syntax Description

w
specifies the width of the input field.
Default: 1 if *w* is not specified
Range: 1–32767

Comparisons

The $REVERJ*w*. informat is similar to the $REVERS*w*. informat except that $REVERS*w*. informat left aligns the result by removing all leading blanks.

Example

The following example uses ABCD as the input value.

```
input @1 name $reverj7.;
```

Values	Results
	----+----1

Values	Results
ABCD	###DCBA
ABCD	DCBA###*

* The character # represents a blank space.

See Also

Informat:

- "$REVERSw. Informat" on page 426

$REVERS*w*. Informat

Reads character data from right to left, and then left aligns the text.

Category: Character

Syntax

$REVERS*w*.

Syntax Description

w
specifies the width of the input field.
Default: 1 if *w* is not specified
Range: 1–32767

Comparisons

The $REVERS*w*. informat is similar to the $REVERJ*w*. informat except that $REVERJ*w*. informat preserves all leading and trailing blanks.

Example

The following example uses ABCD as the input value.

```
input @1 name $revers7.;
```

Values	Results
	----+----1
ABCD	DCBA###
ABCD	DCBA###*

* The # character represents a blank space.

See Also

Informat:

- "$REVERJw. Informat" on page 425

$UCS2B*w*. Informat

Reads a character string that is encoded in big-endian, 16-bit, UCS2, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UCS2B*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 2–32000

Comparisons

The $UCS2B*w*. informat performs processing that is opposite of the $UCS2BE*w*. informat. If you are processing data within the same operating environment, then use the $UCS2X*w*. informat. If you are processing data from different operating environments, then use the $UCS2B*w*. and $UCS2L*w*. informats.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`
`x=input('5927'x,$ucs2b.);` `put x=$hex4.;`	`x=91e5`

See Also

Formats:

- "$UCS2Bw. Format" on page 207
- "$UCS2Lw. Format" on page 210

- "$UCS2Xw. Format" on page 212
- "$UTF8Xw. Format" on page 228

Informats:

- "$UCS2Lw. Informat" on page 429
- "$UCS2Xw. Informat" on page 431
- "$UTF8Xw. Informat" on page 445

$UCS2BE*w*. Informat

Reads a character string that is in the encoding of the current SAS session and then converts the character string to big-endian, 16-bit, UCS2, Unicode encoding.

Category: Character

Syntax

$UCS2BE*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Comparisons

The $UCS2BE*w*. informat performs processing that is opposite of the $UCS2B*w*. informat.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`
`ucs2str=input (' 木', $ucs2be2.);` `put ucs2str=$hex4.;`	`ucs2str=2020`

See Also

Formats:

- "$UCS2Bw. Format" on page 207
- "$UCS2BEw. Format" on page 208

Informat:

- "$UCS2Bw. Informat" on page 427

$UCS2L*w*. Informat

Reads a character string that is encoded in little-endian, 16-bit, UCS2, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UCS2L*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 2–32000

Comparisons

The $UCS2L*w*. informat performs processing that is opposite of the $UCS2LE*w*. informat. If you are processing data within the same operating environment, then use the $UCS2X*w*.informat. If you are processing data from different operating environments, then use the $UCS2B*w*. and $UCS2L*w*. informats.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`
`x=input('2759'x,$ucs2l.);` `put x=$hex4.;`	`x=91e5`

See Also

Formats:

- "$UCS2Bw. Format" on page 207
- "$UCS2Lw. Format" on page 210
- "$UCS2Xw. Format" on page 212
- "$UTF8Xw. Format" on page 228

Informats:

- "$UCS2Bw. Informat" on page 427
- "$UCS2Xw. Informat" on page 431
- "$UTF8Xw. Informat" on page 445

$UCS2LE*w*. Informat

Reads a character string that is in the encoding of the current SAS session and then converts the character string to little-endian, 16-bit, UCS2, Unicode encoding.

Category: Character

Syntax

$UCS2LE*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Comparisons

The $UCS2LE*w*. informat performs processing that is opposite of the $UCS2L*w*. informat.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`

Statements	Result
ucs2str=input ('木', $ ucs2le2.); put ucs2str=$hex4;	ucs2str=2759

See Also

Formats:

- "$UCS2Lw. Format" on page 210
- "$UCS2LEw. Format" on page 211

Informat:

- "$UCS2Lw. Informat" on page 429

$UCS2X*w*. Informat

Reads a character string that is encoded in 16-bit, UCS2, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UCS2X*w*.

Syntax Description

w

specifies the width of the output field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 2–32000

Comparisons

The $UCS2X*w*. informat performs processing that is the opposite of the $UCS2XE*w*. informat. If you are processing data within the same operating environment, then use the $UCS2X*w*. informat. If you are processing data from different operating environments, then use the $UCS2B*w*. and $UCS2L*w*. informats.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment. This example uses little-endian formatting.

Statements	Result
	`----+----1----+`
`x=input('5927'x,$ucs2x.);` `put x=$hex4.;`	`x=91e5`

See Also

Formats:

- “$UCS2Bw. Format” on page 207
- “$UCS2Lw. Format” on page 210
- “$UCS2Xw. Format” on page 212
- “$UTF8Xw. Format” on page 228

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2Lw. Informat” on page 429
- “$UTF8Xw. Informat” on page 445

$UCS2XE*w*. Informat

Reads a character string that is in the encoding of the current SAS session and then converts the character string to 16-bit, UCS2, Unicode encoding.

Category: Character

Syntax

$UCS2XE*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 16-bit size of the Unicode characters.

Default: 8

Range: 1-32000

Comparisons

The $UCS2XE*w*. informat performs processing that is opposite of the $UCS2X*w*. informat.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`
`ucs2str=input (' 大', $ ucs2xe2.);` `put ucs2str=$hex6;`	`ucs2str=5927`

See Also

Formats:

- "$UCS2Xw. Format" on page 212
- "$UCS2XEw. Format" on page 213

Informat:

- "$UCS2Xw. Informat" on page 431

$UCS4B*w*. Informat

Reads a character string that is encoded in big-endian, 32-bit, UCS4, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UCS4B*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 4

Range: 4–32000

Comparisons

If you are processing data within the same operating environment, then use the $UCS4X*w*. informat. If you are processing data from different operating environments, then use the $UCS4B*w*. and $UCS4L*w*. informats.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`

`z=put('Zero1',$UCS4B20.);`
`x=input(z,$UCS4B20.);`
`put x;`
	`Zero1`

See Also

Format:

- "$UCS4Bw. Format" on page 214

Informats:

- "$UCS4Lw. Informat" on page 434
- "$UCS4Xw. Informat" on page 435

$UCS4L*w*. Informat

Reads a character string that is encoded in little-endian, 32-bit, UCS4, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UCS4L*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 4

Range: 4–32000

Comparisons

If you are processing data within the same operating environment, then use the $UCS4X*w*. informat. If you are processing data from different operating environments, then use the $UCS4B*w*. and $UCS4L*w*. informats.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	----+----1----+----2----+----3----+
z=put('.com',$UCS4L16.); put z $hex32.;	2E000000630000006F0000006D000000

See Also

Format:

- "$UCS4Lw. Format" on page 217

Informats:

- "$UCS4Bw. Informat" on page 433
- "$UCS4Xw. Informat" on page 435

$UCS4X*w*. Informat

Reads a character string that is encoded in 32-bit, UCS4, Unicode encoding, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UCS4X*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 4

Range: 4–32000

Comparisons

The $UCS4X*w*. informat performs processing that is the opposite of the $UCS4XE*w*. informat. Use the $UCS4X*w*. informat when you are processing data within the same operating environment. Use the $UCS4B*w*. and $UCS4L*w*. informats when you are processing data from different operating environments.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment. This example uses little-endian formatting.

Statements	Results
	`----+----1----+`

`ucs4=put('91e5'x,$ucs4x.);`
`sjis=input(ucs4,$ucs4x.);`
`put ucs4=$hex8. sjis=$hex8.;`
`run;`
	`ucs4=27590000`
	`sjis=91E52020`

See Also

Formats:

- “$UCS2Xw. Format” on page 212
- “$UCS2Bw. Format” on page 207
- “$UCS2Lw. Format” on page 210
- “$UCS4Xw. Format” on page 219
- “$UTF8Xw. Format” on page 228

Informats:

- “$UCS2Bw. Informat” on page 427
- “$UCS2Lw. Informat” on page 429
- “$UTF8Xw. Informat” on page 445

$UCS4XE*w*. Informat

Reads a character string that is in the encoding of the current SAS session, and then converts the character string to 32-bit, UCS4, Unicode encoding.

Category: Character

Syntax

$UCS4XE*w*.

Syntax Description

w

specifies the width of the input field. Specify enough width to accommodate the 32-bit size of the Unicode characters.

Default: 8

Range: 1–32000

Comparisons

The $UCS4XE*w*. informat performs processing that is the opposite of the $UCS4X*w*. informat.

Example

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`
`ucs4str=input (' 大', $ucs4xe2.);` `put ucs4str=$hex8;`	`ucs4str=00005927`

See Also

Formats:

- "$UCS4Xw. Format" on page 219
- "$UCS4XEw. Format" on page 221

Informat:

- "$UCS4Xw. Informat" on page 435

$UESC*w*. Informat

Reads a character string that is encoded in UESC representation, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UESC*w*.

Syntax Description

w
specifies the width of the output field.

Default: 8

Range: 1–32000

Details

If the characters are not available on all operating environments, for example, 0–9, a–z, A–Z, they must be represented in UESC representation. The $UESC*w*. informat can be nested.

Comparisons

The $UESC*w*. informat performs processing that is the opposite of the $UESCE*w*. informat.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+`

`x=input('¥u5927', $uesc10.);`
`y=input('¥uu5927', $uesc10.);`
`z=input('¥uuu5927', $uesc10.);`
`put x;`
`put y;`
`put z;`
	大
	¥u5927
	¥uu5927

See Also

Formats:

- “$UESCw. Format” on page 222
- “$UESCEw. Format” on page 223

Informat:

- “$UESCEw. Informat” on page 438

$UESCE*w*. Informat

Reads a character string that is in the encoding of the current SAS session, and then converts the character string to UESC representation.

Category: Character

Syntax

$UESCE*w*.

Syntax Description

w
specifies the width of the input field.

Default: 8

Range: 1–32000

Details

The $UESCE*w*. informat can be nested.

Comparisons

The $UESCE*w*. informat performs processing that is opposite of the $UESC*w*. informat.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+`

`x=input('木', $uesc10.);`
`y=input('¥u5927',$uesc10.);`
`z=input('¥uu5927',$uesc10.);`
`put x y z;`
	`¥u5927`
	`¥uu5927`
	`¥uuu5927`

See Also

Formats:

- “$UESCw. Format” on page 222
- “$UESCEw. Format” on page 223

Informat:

- “$UESCw. Informat” on page 437

$UNCR*w*. Informat

Reads an NCR character string, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UNCR*w*.

Syntax Description

w

specifies the width of the input field.

Default: 8

Range: 1–32000

Details

The input string must contain only characters and NCR. Any national characters must be represented in NCR.

Comparisons

The $UNCR*w*. informat performs processing that is opposite of the $UNCRE*w*. informat.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Result
	`----+----1----+`

`x=input ('&#22823;', $uncr10.);`
`y=input('abc', $uncr10.);`
`put X;`
`put Y;`
	大
	abc

See Also

Formats:

- "$UNCRw. Format" on page 224
- "$UNCREw. Format" on page 225

Informat:

- "$UNCREw. Informat" on page 440

$UNCRE*w*. Informat

Reads a character string in the encoding of the current SAS session, and then converts the character string to NCR.

Category: Character

Syntax

$UNCRE*w.*

Syntax Description

w
specifies the width of the input field.

Default: 8

Range: 1–32000

Details

The output string will be converted to plain characters and NCR. Any national characters will be converted to NCR.

Comparisons

The $UNCRE*w.* informat performs processing that is the opposite of the $UNCR*w.* informat.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Result
	`----+----1----+`
`x=input ('&#22823;abc', $uncre12.);` `put x;`	`&#22823;abc`

See Also

Formats:

- "$UNCRw. Format" on page 224
- "$UNCREw. Format" on page 225

Informat:

- "$UNCRw. Informat" on page 439

$UPARENw. Informat

Reads a character string that is encoded in UPAREN representation, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UPAREN*w*.

Syntax Description

w
specifies the width of the input field.

Default: 8

Range: 1–32000

Details

If the SAS session encoding does not have a corresponding Unicode expression, the expression will remain in encoding of the current SAS session.

Comparisons

The $UPAREN*w*. informat performs processing that is opposite of the $UPARENE*w*. informat.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results

`v=input('<u0061>',$uparen10.);`
`w=input('<u0062>',$uparen10.);`
`x=input('<u0063>',$uparen10.);`
`y=input('<u0033>',$uparen10.);`
`z=input('<u5927>',$uparen10.);`
`put v;`
`put w;`
`put x;`
`put y;`
`put z;`
	a
	b
	c
	3
	大

See Also

Formats:

- “$UPARENw. Format” on page 226
- “$UPARENEw. Format” on page 227

Informats:

- “$UPARENEw. Informat” on page 443
- “$UPARENPw. Informat” on page 444

$UPARENE*w*. Informat

Reads a character string that is in the encoding of the current SAS session, and then converts the character string to UPAREN representation.

Category: Character

Syntax

$UPARENE*w*.

Syntax Description

w

specifies the width of the input field.

Default: 8

Range: 1–32000

Comparisons

The $UPARENE*w*. informat performs processing that is opposite of the $UPAREN*w*. informat.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+`

`v=input('a',$uparen10.);`
`w=input('b',$uparene10.);`
`x=input('c',$uparene10.);`
`y=input('3',$uparene10.);`
`z=input('大',$uparen10.);`
`put v;`
`put w;`
`put x;`
`put y;`
`put z;`
	`<u0061>`
	`<u0062>`
	`<u0063>`
	`<u0033>`
	`<u5927>`

See Also

Formats:

- “$UPARENw. Format” on page 226
- “$UPARENEw. Format” on page 227

Informats:

- "$UPARENw. Informat" on page 441
- "$UPARENPw. Informat" on page 444

$UPARENP*w*. Informat

Reads a character string that is encoded in UPAREN representation, and then converts the character string to the encoding of the current SAS session, with national characters remaining in the encoding of the UPAREN representation.

Category: Character

Syntax

$UPARENP*w*.

Syntax Description

w

specifies the width of the input field.

Default: 8

Range: 1–32000

Details

If the UPAREN expression contains a national character, whose value is greater than Unicode 0x00ff, the expression will remain as a UPAREN expression.

Example

These examples use the Japanese Shift_JIS encoding, which is supported under the UNIX operating system.

Statements	Results
	`----+----1----+`

`v=input('<u0061>',$uparen10.);`
`w=input('<u0062>',$uparenp10.);`
`x=input('<u0063>',$uparenp10.);`
`y=input('<u0033>',$uparenp10.);`
`z=input('<u5927>',$uparepn10.);`
`put v;`
`put w;`
`put x;`
`put y;`
`put z;`
	`a`
	`b`
	`c`
	`3`
	`<u5927>`

See Also

Formats:

- "$UPARENw. Format" on page 226
- "$UPARENEw. Format" on page 227

Informats:

- "$UPARENw. Informat" on page 441
- "$UPARENEw. Informat" on page 443

$UTF8X*w*. Informat

Reads a character string that is encoded in UTF-8, and then converts the character string to the encoding of the current SAS session.

Category: Character

Syntax

$UTF8X*w*.

Syntax Description

w

specifies the width of the input field.

Default: 8

Range: 1–32000

Comparisons

This example uses the Japanese Shift_JIS encoding, which is supported under the UNIX operating environment.

Statements	Result
	`----+----1----+`
`x=input (' e5a4a7' x, $utf8x3.);` `put x;`	大

See Also

Formats:

- "$UCS2Bw. Format" on page 207
- "$UCS2Lw. Format" on page 210
- "$UCS2Xw. Format" on page 212

- "$UTF8Xw. Format" on page 228

Informats:

- "$UCS2Bw. Informat" on page 427
- "$UCS2Lw. Informat" on page 429
- "$UCS2Xw. Informat" on page 431

$VSLOG*w*. Informat

Reads a character string that is in visual order, and then converts the character string to left-to-right logical order.

Category: BIDI text handling

Syntax

$VSLOG*w*.

Syntax Description

w
specifies the width of the input field.
Default: 200
Range: 1–32000

Comparisons

The $VSLOG*w*. informat performs processing that is opposite of the $VSLOGR*w*. informat.

Example

The following example uses the Hebrew input value of "טיסה flight".

Statements	Result
	`----+----1----+`
x=input ('טיסה',$vslog12.); `put x;`	טיסה **`flight`**

The following example uses the Arabic input value of "كمبيوتر computer."

Statements	Result
	`----+----1----+`

Statements	Result
x=input (' ذاتcomputer',$vslog12.); put x;	ذاتcomputer

See Also

Formats:

- “$VSLOGRw. Format” on page 232
- “$VSLOGw. Format” on page 230

Informat:

- “$VSLOGRw. Informat” on page 447

$VSLOGR*w*. Informat

Reads a character string that is in visual order, and then converts the character string to right-to-left logical order.

Category: BIDI text handling

Syntax

$VSLOGR*w*.

Syntax Description

w
specifies the width of the input field.
Default: 200
Range: 1–32000

Comparisons

The $VSLOGR*w*. informat performs processing that is opposite of the $VSLOG*w*. informat.

Example

The following example uses the Hebrew input value of “טיסה flight.”

Statements	Result
	----+----1----+

Statements	Result
x=input (' ט ר ס ה ',$vslogr12.); `put x;`	**flight** טיסה

The following example uses the Arabic input value of “ كمبيوتر computer.”

Statements	Result
	`----+----1----+`
x=input (' كمبيوتر computer',$vslogr12.); `put x;`	كمبيوتر computer

See Also

Formats:

- “$VSLOGw. Format” on page 230
- “$VSLOGRw. Format” on page 232

Informat:

- “$VSLOGw. Informat” on page 446

YEN*w.d* Informat

Removes embedded yen signs, commas, and decimal points.

Category: Numeric

Syntax

YEN*w.d*

Syntax Description

w

specifies the width of the input field.

Default: 1

Range: 1–32

d

specifies the power of 10 by which to divide the value.

Requirement: *d* must be 0 or 2

Tip: If the *d* is 2, then YEN*w.d* reads a decimal point and two decimal digits. If *d* is 0, YEN*w.d* reads the value without a decimal part.

Details

The hexadecimal representation of the code for the yen sign character is 5B on EBCDIC systems and 5C on ASCII systems. The monetary character that these codes represent might be different in other countries.

Example

The following example uses yen as the input.

```
input value yen10.2;
```

Value	Result
	`----+----1----+`
`¥1254.71`	`1254.71`

See Also

Format:

- “YENw.d Format” on page 237

Part 7

Macro Functions for NLS

Chapter 13

Macro Function Entries

Macro Functions by Category

The following table provides brief descriptions of the SAS NLS macro functions. For more information, see the NLS entry for each macro function.

Category	Language elements	Description
DBCS	%KCMPRES Macro Function (p. 454)	Compresses multiple blanks and removes leading and trailing blanks.
	%KINDEX Macro Function (p. 454)	Returns the position of the first character of a string.
	%KLEFT and %QKLEFT Macro Functions (p. 455)	Left-aligns an argument by removing leading blanks.
	%KLENGTH Macro Function (p. 455)	Returns the length of a string.
	%KSCAN and %QKSCAN Functions (p. 456)	Search for a word that is specified by its position in a string.
	%KSUBSTR and %QKSUBSTR Macro Functions (p. 460)	Produce a substring of a character string.

Category	Language elements	Description
	%KUPCASE and %QKUPCASE Macro Functions (p. 462)	Convert values to uppercase.

Dictionary

%KCMPRES Macro Function

Compresses multiple blanks and removes leading and trailing blanks.

Category: DBCS

Type: NLS macro function

Syntax

%KCMPRES (*text* | *text expression*)

Details

The %KCMPRES macro function compresses multiple blanks and removes leading and trailing blanks.

%KINDEX Macro Function

Returns the position of the first character of a string.

Category: DBCS

Type: NLS macro function

Syntax

%KINDEX (*source*, *string*)

Required Arguments

source
is a character string or text expression.

string
is a character string or text expression.

Details

The %KINDEX function searches *source* for the first occurrence of *string* and returns the position of its first character. If *string* is not found, the function returns 0.

Example: Locating a Character

The following statements find the first character **v** in a string:

```
%let a=a very long value;
%let b=%kindex(&a,v);
%put V appears at position &b..;
```

When these statements execute, the following line is written to the SAS log:

```
V appears at position 3.
```

%KLEFT and %QKLEFT Macro Functions

Left-aligns an argument by removing leading blanks.

Category: DBCS

Requirement: MAUTOSOURCE system option

Syntax

%KLEFT (*text* | *text expression*)

%QKLEFT (*text* | *text expression*)

Details

The %KLEFT and %KQLEFT macro functions left-align arguments by removing leading blanks. If the argument contains a special character or mnemonic operator, listed here, use %KQLEFT.

%KLEFT returns an unquoted result, even if the argument is quoted. %KQLEFT produces a result with the following special characters and mnemonic operators masked so that the macro processor interprets them as text instead of as elements of the macro language:

```
& % ' " ( ) + - * / < > = ¬ ^ ~ ; , # blank
AND OR NOT EQ NE LE LT GE GT IN
```

%KLENGTH Macro Function

Returns the length of a string.

Category: DBCS

Type: NLS macro function

Syntax

%KLENGTH (*character string* | *text expression*)

Details

If the argument is a character string, %KLENGTH returns the length of the string. If the argument is a text expression, %KLENGTH returns the length of the resolved value. If the argument has a null value, %KLENGTH returns 0.

Example: Returning String Lengths

The following statements find the lengths of character strings and text expressions:

```
%let a=Happy;
%let b=Birthday;
%put The length of &a is %klength(&a).;
%put The length of &b is %klength(&b).;
%put The length of &a &b To You is %klength(&a &b to you).;
```

When these statements execute, the following is written to the SAS log:

```
The length of Happy is 5.
The length of Birthday is 8.
The length of Happy Birthday To You is 21.
```

%KSCAN and %QKSCAN Functions

Search for a word that is specified by its position in a string.

Category: DBCS

Type: NLS macro function

Syntax

%KSCAN (*argument*, *n*<,*charlist*<,*modifiers*>>)

%QKSCAN (*argument*, *n*<,*charlist*<,*modifiers*>>)

Required Arguments

argument
is a character string or a text expression. If *argument* contains a special character or mnemonic operator, listed here, use %QKSCAN.

n
is an integer or a text expression that yields an integer, which specifies the position of the word to return. If *n* is greater than the number of words in *argument*, the functions return a null string. If *n* is negative, %KSCAN examines the character string and selects the word that starts at the end of the string and searches backward.

charlist
specifies an optional character expression that initializes a list of characters. This list determines which characters are used as the delimiters that separate words. The following rules apply:

- By default, all characters in *charlist* are used as delimiters.
- If you specify the K modifier in the *modifier* argument, then all characters that are *not* in *charlist* are used as delimiters.

Tip: You can add more characters to *charlist* by using other modifiers.

modifier
specifies a character constant, a variable, or an expression in which each non-blank character modifies the action of the %KSCAN function. Blanks are ignored. You can use the following characters as modifiers:

a or A — adds alphabetic characters to the list of characters.

b or B — scans backward from right to left instead of from left to right, regardless of the sign of the *count* argument.

c or C — adds control characters to the list of characters.

d or D — adds digits to the list of characters.

f or F — adds an underscore and English letters (that is, valid first characters in a SAS variable name using **VALIDVARNAME=V7**) to the list of characters.

g or G — adds graphic characters to the list of characters. Graphic characters are characters that, when printed, produce an image on paper.

h or H — adds a horizontal tab to the list of characters.

i or I — ignores the case of the characters.

k or K — treats all characters that are not in the list of characters as delimiters. That is, if K is specified, then characters that are in the list of characters are kept in the returned value rather than being omitted because they are delimiters. If K is not specified, then all characters that are in the list of characters are treated as delimiters.

l or L — adds lowercase letters to the list of characters.

m or M — specifies that multiple consecutive delimiters, and delimiters at the beginning or end of the *string* argument, refer to words that have a length of zero. If the M modifier is not specified, then multiple consecutive delimiters are treated as one delimiter, and delimiters at the beginning or end of the *string* argument are ignored.

n or N — adds digits, an underscore, and English letters (that is, the characters that can appear in a SAS variable name using **VALIDVARNAME=V7**) to the list of characters.

o or O — processes the *charlist* and *modifier* arguments only once, rather than every time the %KSCAN function is called. Using the O modifier in the DATA step (excluding WHERE clauses) or in the SQL procedure can make %KSCAN run faster when you call it in a loop where the *charlist* and *modifier* arguments do not change. The O modifier applies separately to each instance of the %KSCAN function in your SAS code. It does not cause all instances of the %KSCAN function to use the same delimiters and modifiers.

p or P — adds punctuation marks to the list of characters.

q or Q — ignores delimiters that are inside of substrings that are enclosed in quotation marks. If the value of the *string* argument contains unmatched quotation marks, then scanning from left to right produces different words than scanning from right to left.

r or R — removes leading and trailing blanks from the word that %KSCAN returns. If you specify both the Q and R modifiers, then the %KSCAN function first removes leading and trailing blanks from the word.

Then, if the word begins with a quotation mark, %KSCAN also removes one layer of quotation marks from the word.

s or S adds space characters to the list of characters (blank, horizontal tab, vertical tab, carriage return, line feed, and form feed).

t or T trims trailing blanks from the *string* and *charlist* arguments. If you want to remove trailing blanks from only one character argument instead of both character arguments, then use the TRIM function instead of the %KSCAN function with the T modifier.

u or U adds uppercase letters to the list of characters.

w or W adds printable (writable) characters to the list of characters.

x or X adds hexadecimal characters to the list of characters.

Tip: If the *modifier* argument is a character constant, then enclose it in quotation marks. Specify multiple modifiers in a single set of quotation marks. A *modifier* argument can also be expressed as a character variable or expression.

Details

The %KSCAN and %QKSCAN functions search *argument* and return the *n*th word. A word is one or more characters separated by one or more delimiters.

%KSCAN does not mask special characters or mnemonic operators in its results, even when the argument was previously masked by a macro quoting function. %QKSCAN masks the following special characters and mnemonic operators in its results:

```
& % ' " ( ) + - * / < > = ¬ ^ ~ ; , # blank
AND OR NOT EQ NE LE LT GE GT IN
```

A *delimiter* is any of several characters that are used to separate words. You can specify the delimiters in the *charlist* and *modifier* arguments.

If you specify the Q modifier, then delimiters inside of substrings that are enclosed in quotation marks are ignored.

In the %KSCAN function, *word* refers to a substring that has all of the following characteristics:

- is bounded on the left by a delimiter or the beginning of the string
- is bounded on the right by a delimiter or the end of the string
- contains no delimiters

A word can have a length of zero if there are delimiters at the beginning or end of the string or if the string contains two or more consecutive delimiters. However, the %KSCAN function ignores words that have a length of zero unless you specify the M modifier.

If you use the %KSCAN function with only two arguments, then the default delimiters depend on whether your computer uses ASCII or EBCDIC characters:

- If your computer uses ASCII characters, then the default delimiters are as follows:

  blank ! $ % & ( ) * + , - . / ; < ^|

  In ASCII environments that do not contain the ^ character, the %KSCAN function uses the ~ character instead.

- If your computer uses EBCDIC characters, then the default delimiters are as follows:

  blank ! $ % & ( ) * + , - . / ; < ¬ | ¢¦

If you use the *modifier* argument without specifying any characters as delimiters, then the only delimiters that will be used are delimiters that are defined by the *modifier* argument. In this case, the lists of default delimiters for ASCII and EBCDIC environments are not used. In other words, modifiers add to the list of delimiters that are specified by the *charlist* argument. Modifiers do not add to the list of default modifiers.

If you specify the M modifier, then the number of words in a string is defined as one plus the number of delimiters in the string. However, if you specify the Q modifier, delimiters that are inside quotation marks are ignored.

If you specify the M modifier, then the %KSCAN function returns a word with a length of zero if one of the following conditions is true:

- The string begins with a delimiter and you request the first word.
- The string ends with a delimiter and you request the last word.
- The string contains two consecutive delimiters and you request the word that is between the two delimiters.

If you do not specify the M modifier, then the number of words in a string is defined as the number of maximal substrings of consecutive nondelimiters. However, if you specify the Q modifier, delimiters that are inside quotation marks are ignored.

If you do not specify the M modifier, then the %KSCAN function does the following:

- ignores delimiters at the beginning or end of the string
- treats two or more consecutive delimiters as if they were a single delimiter

If the string contains no characters other than delimiters or if you specify a count that is greater in absolute value than the number of words in the string, then the %KSCAN function returns one of the following:

- a single blank when you call the %KSCAN function from a DATA step
- a string with a length of zero when you call the %KSCAN function from the macro processor

The %KSCAN function allows character arguments to be null. Null arguments are treated as character strings with a length of zero. Numeric arguments cannot be null.

Example: Comparing the Actions of %KSCAN and %QKSCAN

This example illustrates the actions of %KSCAN and %QKSCAN:

```
%macro a;
   aaaaaa
%mend a;
%macro b;
   bbbbbb
%mend b;
%macro c;
   cccccc
%mend c;
%let x=%nrstr(%a*%b*%c);
%put X: &x;
%put The third word in X, with KSCAN: %kscan(&x,3,*);
%put The third word in X, with QKSCAN: %qkscan(&x,3,*);
```

The %PUT statement writes these lines to the log:

```
X: %a*%b*%c
The third word in X, with KSCAN: cccccc
The third word in X, with QKSCAN: %c
```

%KSUBSTR and %QKSUBSTR Macro Functions

Produce a substring of a character string.

Category: DBCS

Type: NLS macro function

Syntax

%KSUBSTR (*argument*, *position*<, *length*>)

%QKSUBSTR (*argument*, *position*<, *length*>)

Required Arguments

argument
is a character string or a text expression. If *argument* contains a special character or mnemonic operator, listed here, use %QKSUBSTR.

position
is an integer or an expression (text, logical, or arithmetic) that yields an integer that specifies the position of the first character in the substring. If *position* is greater than the number of characters in the string, %KSUBSTR and %QKSUBSTR issue a warning message and return a null value.

length
is an optional integer or an expression (text, logical, or arithmetic) that yields an integer that specifies the number of characters in the substring. If *length* is greater than the number of characters following *position* in *argument*, %KSUBSTR and %QKSUBSTR issue a warning message and return a substring containing the characters from *position* to the end of the string. By default, %KSUBSTR and %QKSUBSTR produce a string containing the characters from *position* to the end of the character string.

Details

The %KSUBSTR and %QKSUBSTR functions produce a substring of *argument*, which begins at *position* and continues for the number of characters in *length*.

%KSUBSTR does not mask special characters or mnemonic operators in its result. %QKSUBSTR masks the following special characters and mnemonic operators:

```
& % ' " ( ) + - * / < > = ¬ ^ ~ ; , #  blank
AND OR NOT EQ NE LE LT GE GT IN
```

Examples

Example 1: Limiting a Fileref to Eight Characters

The macro MAKEFREF uses %KSUBSTR to assign the first eight characters of a parameter as a fileref, in case a user assigns one that is longer:

```
%macro makefref(fileref,file);
   %if %klength(&fileref) gt 8 %then
       %let fileref = %ksubstr(&fileref,1,8);
   filename &fileref "&file";
%mend makefref;
%makefref(humanresource,/dept/humanresource/report96)
```

SAS reads the following statement:

```
FILENAME HUMANRES "/dept/humanresource/report96";
```

Example 2: Storing a Long Macro Variable Value in Segments

The macro SEPMSG separates the value of the macro variable MSG into 40-character units and stores each unit in a separate variable:

```
%macro sepmsg(msg);
   %let i=1;
   %let start=1;
   %if %length(&msg)>40 %then
      %do;
          %do %until(%klength(&&msg&i)<40);
             %let msg&i=%qksubstr(&msg,&start,40);
             %put Message &i is: &&msg&i;
             %let i=%eval(&i+1);
             %let start=%eval(&start+40);
             %let msg&i=%qksubstr(&msg,&start);
          %end;
          %put Message &i is: &&msg&i;
      %end;
   %else %put No subdivision was needed.;
%mend sepmsg;
%sepmsg(%nrstr(A character operand was found in the %EVAL function
or %IF condition where a numeric operand is required.  A character
operand was found in the %EVAL function or %IF condition where a
numeric operand is required.));
```

When this program executes, these lines are written to the SAS log:

```
Message 1 is: A character operand was found in the %EV
Message 2 is: AL function or  %IF condition where a nu
Message 3 is: meric operand is required.  A character
Message 4 is: operand was  found in the %EVAL function
Message 5 is: or %IF condition where a numeric operan
Message 6 is: d is required.
```

Example 3: Comparing the Actions of %KSUBSTR and %QKSUBSTR

%KSUBSTR produces a resolved result because it does not mask special characters and mnemonic operators in the C language before processing it:

```
%let a=one;
%let b=two;
%let c=%nrstr(&a &b);
%put C: &c;
%put With KSUBSTR: %ksubstr(&c,1,2);
%put With QKSUBSTR: %qKsubstr(&c,1,2);
```

When these statements execute, these lines are written to the SAS log:

```
C: &a &b
With KSUBSTR: one
With QKSUBSTR: &a
```

%KUPCASE and %QKUPCASE Macro Functions

Convert values to uppercase.

Category: DBCS

Type: NLS macro function

Syntax

%KUPCASE (*character string* | *text expression*)

%QKUPCASE (*character string* | *text expression*)

Details

The %KUPCASE and %QKUPCASE functions convert lowercase characters in the argument to uppercase. %KUPCASE does not mask special characters or mnemonic operators in its results.

If the argument contains a special character or mnemonic operator, listed here, use %QKUPCASE. %QKUPCASE masks the following special characters and mnemonic operators in its results:

```
& % ' " ( ) + - * / < > = ¬ ^ ~ ; , # blank
AND OR NOT EQ NE LE LT GE GT IN
```

%KUPCASE and %QKUPCASE are useful in comparing values because the macro facility does not automatically convert lowercase characters to uppercase before comparing them.

Examples

Example 1: Capitalizing a Value to Be Compared

In this example, the macro RUNREPT compares a value input for the macro variable MONTH to the string DEC. If the uppercase value of the response is DEC, then PROC FSVIEW runs on the data set REPORTS.ENDYEAR. Otherwise, PROC FSVIEW runs on the data set with the name of the month in the REPORTS data library.

```
%macro runrept(month);
   %if %kupcase(&month)=DEC %then
       %str(proc fsview data=reports.endyear; run;);
   %else %str(proc fsview data=reports.&month; run;);
%mend runrept;
```

You can invoke the macro in any of these ways to satisfy the %IF condition:

```
%runrept(DEC)
%runrept(Dec)
%runrept(dec)
```

Example 2: Comparing %KUPCASE and %QKUPCASE

These statements show the results produced by %KUPCASE and %QKUPCASE:

```
%let a=begin;
%let b=%nrstr(&a);
%put KUPCASE produces: %kupcase(&b);
%put QKUPCASE produces: %qkupcase(&b);
```

When these statements execute, the following is written to the SAS log:

```
KUPCASE produces: begin
QKUPCASE produces: &A
```

Part 8

System Options for NLS

Chapter 14

System Option Entries

System Option Entries by Category

The language control category of SAS system options are affected by NLS. The following table provides brief descriptions of the SAS system options. For more detailed descriptions, see the dictionary entry for each SAS system option:

Category	Language elements	Description
Environment control: Language control	DATESTYLE= System Option (p. 470)	Identifies the sequence of month, day, and year when the ANYDTDTM, ANYDTDTE, or ANYDTTME informats encounter input where the year, month, and day determination is ambiguous.

Category	Language elements	Description
	DBCS System Option: UNIX, Windows, and z/OS (p. 470)	Recognizes double-byte character sets (DBCS).
	DBCSLANG System Option: UNIX, Windows, and z/OS (p. 471)	Specifies a double-byte character set (DBCS) language.
	DBCSTYPE System Option: UNIX, Windows, and z/OS (p. 472)	Specifies the encoding method to use for a double-byte character set (DBCS).
	DFLANG= System Option: UNIX, Windows, and z/OS (p. 474)	Specifies the language for international date informats and formats.
	ENCODING System Option: UNIX, Windows, and z/OS (p. 476)	Specifies the default character-set encoding for the SAS session.
	FSDBTYPE System Option: UNIX (p. 477)	Specifies a full-screen double-byte character set (DBCS) encoding method.
	FSIMM System Option: UNIX (p. 478)	Specifies input method modules (IMMs) for full-screen double-byte character set (DBCS).
	FSIMMOPT System Option: UNIX (p. 479)	Specifies options for input method modules (IMMs) that are used with a full-screen double-byte character set (DBCS).
	LOCALE System Option (p. 480)	Specifies a set of attributes in a SAS session that reflect the language, local conventions, and culture for a geographical region.
	LOCALELANGCHG System Option (p. 481)	Determines whether the language of the text of the ODS output can be changed
	NLSCOMPATMODE System Option: z/OS (p. 483)	Provides national language compatibility with previous releases of SAS.
	PAPERSIZE= System Option (p. 484)	Specifies the paper size for the printer to use.
	TRANTAB= System Option (p. 486)	Specifies the translation tables that are used by various parts of SAS.
	URLENCODING= System Option (p. 488)	Specifies whether the argument to the URLENCODE function and to the URLDECODE function is interpreted using the SAS session encoding or UTF-8 encoding.
Files: External files	BOMFILE System Option (p. 469)	Specifies whether to write the byte order mark (BOM) prefix on Unicode-encoded external files.
Files: SAS files	RSASIOTRANSERROR System Option (p. 484)	Displays a transcoding error when illegal data is read from a remote application.

Category	Language elements	Description
Input control: Data Processing	DATESTYLE= System Option (p. 470)	Identifies the sequence of month, day, and year when the ANYDTDTM, ANYDTDTE, or ANYDTTME informats encounter input where the year, month, and day determination is ambiguous.
SAS files	VALIDMEMNAME System Option (p. 488)	Specifies the rules for naming SAS data sets, views, and item stores.
	VALIDVARNAME= System Option (p. 489)	Specifies the rules for valid SAS variable names that can be created and processed during a SAS session.
Sort: Procedure options	SORTSEQ= System Option: UNIX, Windows, and z/OS (p. 485)	Specifies a language-specific collating sequence for the SORT and SQL procedures to use in the current SAS session.

Dictionary

BOMFILE System Option

Specifies whether to write the byte order mark (BOM) prefix on Unicode-encoded external files.

Valid in: configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Files: External files

PROC OPTIONS GROUP= EXTFILES

Syntax

BOMFILE | **NOBOMFILE**

Syntax Description

BOMFILE
Specifies to write a byte order mark (BOM) prefix when a Unicode-encoded file is written to an external file.

NOBOMFILE
Specifies not to write a BOM prefix when a Unicode-encoded file is written to an external file.

Details

The BOMFILE system option does not apply when a Unicode-encoded external file is read.

A BOM is a signature at the beginning of a Unicode data stream. The size of the BOM varies depending on the encoding.

DATESTYLE= System Option

Identifies the sequence of month, day, and year when the ANYDTDTM, ANYDTDTE, or ANYDTTME informats encounter input where the year, month, and day determination is ambiguous.

Valid in: configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Categories: Environment control: Language control
Input control: Data Processing

PROC OPTIONS GROUP= INPUTCONTROL, LANGUAGECONTROL

See: DATESTYLE= system option in *SAS System Options: Reference*

DBCS System Option: UNIX, Windows, and z/OS

Recognizes double-byte character sets (DBCS).

Valid in: configuration file, SAS invocation

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

Default: NODBCS

UNIX specifics: Also valid in SASV9_OPTIONS environment variable

Syntax

-DBCS | -NODBCS (UNIX and Windows)

DBCS | NODBCS (z/OS)

Required Arguments

DBCS
recognizes double-byte character sets (DBCS) for encoding values. DBCS encodings are used to support East Asian languages.

NODBCS
does not recognize a DBCS for encoding values. Instead, a single-byte character set (SBCS) is used for encoding values. A single byte is used to represent each character in the character set.

Details

The DBCS system option is used for supporting languages from East Asian countries such as Chinese, Japanese, Korean, and Taiwanese.

See Also

Conceptual Information:

- "Double-Byte Character Sets (DBCS)" on page 37
- "DBCS Values for a SAS Session" on page 575
- "Encoding Values in SAS Language Elements" on page 577

System Options:

- "DBCSLANG System Option: UNIX, Windows, and z/OS" on page 471
- "DBCSTYPE System Option: UNIX, Windows, and z/OS" on page 472

DBCSLANG System Option: UNIX, Windows, and z/OS

Specifies a double-byte character set (DBCS) language.

Valid in: configuration file, SAS invocation

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

Default: none

UNIX specifics: Also valid in SASV9_OPTIONS environment variable

Syntax

-DBCSLANG *language* (UNIX and Windows)

DBCSLANG = *language* (z/OS)

Required Argument

language

depends on the operating environment. The following table contains valid language values:

Table 14.1 *Supported DBCS Languages According to Operating Environment*

Language	z/OS	UNIX	Windows
CHINESE (simplified)	yes*	yes	yes
JAPANESE	yes	yes	yes
KOREAN	yes	yes	yes
TAIWANESE (traditional)	yes	yes	yes
NONE	yes	no	yes

Language	z/OS	UNIX	Windows
UNKNOWN	yes	no	no

* For z/OS only, HANGUL and HANZI are valid aliases for CHINESE.

Details

The proper setting for the DBCSLANG system option depends on which setting is used for the DBCSTYPE system option. Some of the settings of DBCSTYPE support all of the DBCSLANG languages, while other settings of DBCSTYPE support only Japanese.

CHINESE specifies the language used in the People's Republic of China, which is known as simplified Chinese. TAIWANESE specifies the Chinese language used in Taiwan, which is known as traditional Chinese.

See Also

- "Double-Byte Character Sets (DBCS)" on page 37
- "DBCS Values for a SAS Session" on page 575
- "Encoding Values in SAS Language Elements" on page 577

System Options:

- "DBCS System Option: UNIX, Windows, and z/OS" on page 470
- "DBCSTYPE System Option: UNIX, Windows, and z/OS" on page 472

DBCSTYPE System Option: UNIX, Windows, and z/OS

Specifies the encoding method to use for a double-byte character set (DBCS).

Valid in: configuration file, SAS invocation

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

z/OS specifics: IBM

UNIX specifics: Depends on the specific machine
Also valid in SASV9_OPTIONS environment variable

Windows specifics: PCMS

Syntax

-DBCSTYPE *encoding-method* (UNIX and Windows)

DBCSTYPE = *encoding-method* (z/OS)

Required Argument

encoding-method

specifies the method that is used to encode a double-byte character set (DBCS). Valid values for *encoding-method* depend on the standard that the computer hardware manufacturer applies to the operating environment.

Details

DBCS encoding methods vary according to the computer hardware manufacturer and the standards organization.

The DBCSLANG= system option specifies the language that the encoding method is applied to. You should specify DBCSTYPE= only if you also specify the DBCS and DBCSLANG= system options.

z/OS DBCSTYPE= supports the DBCSTYPE= value of IBM.

Comparisons

Table 14.2 *DBCS Encoding Methods for z/OS*

DBCSTYPE= Value	Description
IBM	IBM PC encoding method

Table 14.3 *DBCS Encoding Methods for UNIX*

DBCSTYPE= Value	Description
DEC	DEC encoding method
EUC	Extended UNIX Code encoding method
HP15	Hewlett Packard encoding method
PCIBM	IBM PC encoding method
PCMS	Microsoft PC encoding method
SJIS	Shift-JIS encoding method for the Japanese language only
NONE	Disables DBCS processing

Table 14.4 *DBCS Encoding Methods for Windows*

DBCSTYPE= Value	Description
PCMS	Microsoft PC encoding method
WINDOWS	Alias for PCMS

DBCSTYPE= Value	Description
SJIS	Shift-JIS encoding method for the Japanese language only

See Also

Conceptual Information:

- “Double-Byte Character Sets (DBCS)” on page 37
- “DBCS Values for a SAS Session” on page 575
- “Encoding Values in SAS Language Elements” on page 577

System Options:

- “DBCS System Option: UNIX, Windows, and z/OS” on page 470
- “DBCSLANG System Option: UNIX, Windows, and z/OS” on page 471

DFLANG= System Option: UNIX, Windows, and z/OS

Specifies the language for international date informats and formats.

Valid in: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

Default: English

Syntax

DFLANG='*language*', **locale**

Syntax Description

'language'
specifies the language that is used for international date informats and formats.

These languages are valid values for *language*:

- Afrikaans
- Catalan
- Croatian
- Czech
- Danish
- Dutch
- English

- Finnish
- French
- German
- Hungarian
- Italian
- Japanese
- Macedonian
- Norwegian
- Polish
- Portuguese
- Russian
- Slovenian
- Spanish
- Swedish
- Swiss_French
- Swiss_German

locale
the locale that is specified with the locale system option becomes the active locale.

Details

You can change the value of the DFLANG system option during a SAS session, but you can use only one language at a time. The values for *language* are not case-sensitive.

When you specify **dflang=locale**, the locale that is specified in the system option, of the locale statement becomes the active locale. The locale/language must be supported by the DFLANG system option.

In the following example, the international date informats and formats would be German. The posix name for German locale is de_DE. The German locale is supported by the DFLANG system option.

```
option locale=de_DE; /* German locale */
  option  DFLANG=locale;
```

In the following example, the international date informats and formats would be English. Maltese is not supported by dflang, so the default locale is English.

```
option locale=mt_MT;  /* Maltese locale */
  option  DFLANG=locale;
```

When you specify **dflang=locale**, the output of the date format is displayed in the locale that is specified with the LOCALE system option. To control the date format in the output, the DFLANG locale uses the value based on the LOCALE system option that has been set at startup. If DFLANG is set to a valid language, then the date format in the output is English by default. In the following example, the locale is set to French and a listing output is specified:

```
Sas.exe -locale French
  Proc print data=sashelp.class ; run ;
```

```
mercredi 09 mars 2011 14 h 25
```

ENCODING System Option: UNIX, Windows, and z/OS

Specifies the default character-set encoding for the SAS session.

Valid in: configuration file, SAS invocation

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

OpenVMS specifics: latin1

z/OS specifics: OPEN_ED-1047

Windows specifics: wlatin1

Syntax

-ENCODING= ASCIIANY | EBCDICANY | *encoding-value* (UNIX and Windows)

ENCODING= *encoding-value* (UNIX, Windows, and z/OS)

Required Arguments

ASCIIANY
Transcoding normally occurs when SAS detects that the session encoding and data set encoding are different. ASCIIANY enables you to create a data set that SAS will not transcode if the SAS session that accesses the data set has a session that encoding value of ASCII. If you transfer the data set to a machine that uses EBCDIC encoding, transcoding occurs.

Note: ANY is a synonym for binary. Because the data is binary, the actual encoding is irrelevant.

EBCDICANY
is valid only for z/OS. Transcoding normally occurs when SAS detects that the session encoding and the data set encoding are different. EBCDICANY enables you to create a data set that SAS will not transcode if the SAS session accessing the data set has a session encoding value of EBCDIC. If you transfer the data set to a machine that uses ASCII encoding, transcoding occurs.

encoding-value
For valid values for all operating environments, see "Encoding Values for a SAS Session" on page 587.

Details

A character-set encoding is a set of characters that have been mapped to numeric values called code points.

The encoding for a SAS session is determined by the values of the ENCODING=, LOCALE=, DBCSTYPE=, and DBCSLANG= system options as follows:

- If the ENCODING= and LOCALE= system options are not specified, the default value is ENCODING=. For UNIX, the default value is **latin1**; for Windows, the default value is wlatin1; for z/OS, the default is OPEN_ED-1047.
- If the ENCODING option is not specified, the value of Encoding is determined by the value of LOCALE and the operating system where SAS is running. Also, if LOCALE is not set, the default LOCALE is en_US.
- If both LOCALE= and ENCODING= are specified, the session encoding is the value that is specified by the ENCODING= option.
- If LOCALE= is specified and ENCODING= is not specified, SAS infers the appropriate encoding value from the LOCALE= value.
- If the DBCS option is set, the values for the DBCSLANG= and DBCSTYPE= system options determine the ENCODING= and LOCALE= values.

See Also

Conceptual Information:

- "Overview of Locale Concepts for NLS" on page 5
- Conceptual discussion about "Overview: Encoding for NLS" on page 9
- Conceptual discussion about "Overview to Transcoding" on page 27
- Table 18.1 on page 561
- "SAS System Options for Processing DBCS Data" on page 575
- "Encoding Values in SAS Language Elements" on page 577

FSDBTYPE System Option: UNIX

Specifies a full-screen double-byte character set (DBCS) encoding method.

Valid in:	configuration file, SAS invocation, SASV9_OPTIONS environment variable
Category:	Environment control: Language control
PROC OPTIONS GROUP=	LANGUAGECONTROL
Default:	DEFAULT
UNIX specifics:	all

Syntax

-FSDBTYPE *encoding-method*

Details

The FSDBTYPE= system option specifies the encoding method that is appropriate for a full-screen DBCS enabling method. Full-screen DBCS encoding methods vary according to the computer hardware manufacturer and the standards organization.

Table 14.5 Full-Screen DBCS Encoding Methods

FSDBTYPE= Encoding Method	Description
dec	Digital Equipment Corporation encoding method
euc	Extended UNIX encoding method
hp15	HP-UX encoding method
jis7	7-bit Shift-JIS encoding method used in an X windows environment for the Japanese language only
pcibm	IBM PC encoding method
sjis	Shift-JIS encoding method for the Japanese language only
default	default method that is used by the specific host

See Also

Conceptual Information:

- “Double-Byte Character Sets (DBCS)” on page 37
- “DBCS Values for a SAS Session” on page 575
- “Encoding Values in SAS Language Elements” on page 577

FSIMM System Option: UNIX

Specifies input method modules (IMMs) for full-screen double-byte character set (DBCS).

Valid in: configuration file, SAS invocation, SASV9_OPTIONS environment variable

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

Default: none

UNIX specifics: all

Syntax

-FSIMM*fsdevice_name=IMM-name1<, fsdevice_name=IMM-name2> ...*

Details

You can specify the following values for *IMM-name*:

TTY | SASWUJT
: provides an interface for **/dev/tty**. This IMM enables you to enter DBCS strings through a terminal emulator that has DBCS input capability.

PIPE | SASWUJP
: provides a pipe interface. This interface forks the DBCS input server process. The default server name is **saswujms**, which uses the vendor-supplied MOTIF toolkit.

For example, to use the PIPE input method module for X11 drivers, you would specify:

```
-FSIMM X11=PIPE
```

Note: The server is specified by using the FSIMMOPT option.

See Also

Conceptual Information:

- "Double-Byte Character Sets (DBCS)" on page 37

System Option:

- "FSIMMOPT System Option: UNIX " on page 479

FSIMMOPT System Option: UNIX

Specifies options for input method modules (IMMs) that are used with a full-screen double-byte character set (DBCS).

Valid in:	configuration file, SAS invocation, SASV9_OPTIONS environment variable
Category:	Environment control: Language control
PROC OPTIONS GROUP=	LANGUAGECONTROL
Default:	none
UNIX specifics:	all

Syntax

-FSIMMOPT *fullscreen-IMM*:*IMM-option*

Details

The FSIMMOPT system option specifies an option for each full-screen IMM (input method module). You can specify only one FSIMMOPT option for each IMM. If you specify multiple FSIMMOPT options for the same IMM, only the last specification is used.

For option values for each IMM, see SAS Technical Report J-121, *DBCS Support Usage Guide* (in Japanese).

For example, you can use the FSIMMOPT option to specify the name of the server, MOTIF, to be used for the PIPE IMM:

```
-fsimmopt PIPE:MOTIF
```

See Also

Conceptual Information:

- “Double-Byte Character Sets (DBCS)” on page 37

System Option:

- “FSIMM System Option: UNIX ” on page 478

LOCALE System Option

Specifies a set of attributes in a SAS session that reflect the language, local conventions, and culture for a geographical region.

Valid in:	configuration file, SAS invocation, OPTIONS statement, SAS System Options window
Category:	Environment control: Language control
PROC OPTIONS GROUP=	LANGUAGECONTROL
Default:	English_UnitedStates
UNIX specifics:	Also valid in SASV9_OPTIONS environment variable

Syntax

-LOCALE *locale-name* (UNIX and Windows)

LOCALE=*locale-name* (UNIX, Windows, and z/OS)

Required Argument

locale-name

For a complete list of locale values (SAS names and POSIX names), see “LOCALE= Values and Default Settings for ENCODING, PAPERSIZE, DFLANG, and DATESTYLE Options” on page 561.

Details

The LOCALE= system option is used to specify the locale, which reflects the local conventions, language, and culture a geographical region.

If the value of the LOCALE= system option is not compatible with the value of the ENCODING= system option, the character-set encoding is determined by the value of the ENCODING= system option.

If the DBCS= system option is active, the values of the DBCSTYPE= and DBCSLANG= system options determine the locale and character-set encoding.

When you set a value for LOCALE=, the value of the following system options are modified unless explicit values have been specified:

ENCODING=

The locale that you set has a common encoding value that is used most often in the operating environment where SAS runs. If the ENCODING= option is not set

explicitly in a config file or on the command line, SAS will use the ENCODING that is default for the LOCALE and operating system. The LOCALE may be set explicitly or may default. When the ENCODING= system option is set, the TRANTAB= system option is also set.

DATESTYLE=
When LOCALE= is set, the DATESTYLE= system option uses the value that corresponds to the chosen locale.

DFLANG=
When LOCALE= is set, the DFLANG= system option is set to a value that corresponds to the chosen locale.

PAPERSIZE=
When LOCALE= is set, the PAPERSIZE= system option is set to a value that corresponds to the chosen locale and the ODS printer is set to the preferred unit of measurement, inches or centimeters, for that locale.

CAUTION:
Under the Windows operating systems only: The LOCALE= option can be used to specify PAPERSIZE= only if the UNIVERSALPRINT and UPRINTMENUSWITCH system options are also specified. For details, see the UNIVERSALPRINT system option in *SAS System Options: Reference* and the UPRINTMENUSWITCH system option in *SAS Companion for Windows*.

See Also

Conceptual Information:

- "Locale for NLS" on page 5
- "LOCALE= Values and Default Settings for ENCODING, PAPERSIZE, DFLANG, and DATESTYLE Options" on page 561

System Options:

- "ENCODING System Option: UNIX, Windows, and z/OS" on page 476
- "DATESTYLE= System Option" in *SAS System Options: Reference*
- "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474
- "PAPERSIZE= System Option" in *SAS System Options: Reference*
- "TRANTAB= System Option" on page 486

LOCALELANGCHG System Option

Determines whether the language of the text of the ODS output can be changed

Valid in:	configuration file, SAS invocation
Category:	Environment control: Language control
PROC OPTIONS GROUP=	LANGUAGECONTROL
Default:	LOCALELANGCHG is set to off in all servers except for the UNICODE server

Tip: The Language Switching feature, which uses the LOCALELANGCHG option, is supported in a Unicode server (a SAS server with a session encoding of UTF-8, ENCODING=utf8).

Syntax

LOCALELANGCHG | **NOLOCALELANGCHG**

Syntax Description

LOCALELANGCHG
Specifies that the language of the SAS message text in ODS output can change when the LOCALE option is set after start up.

NOLOCALELANGCHG
Specifies that the language of the SAS message text in ODS output cannot change when the LOCALE option is set after start up.

Details

The Language Switching feature enables you to change the language of SAS messages after start up. You must enable LOCALELANGCHG to use this feature.

During start up, the configuration file and LOCALE option determine the language for SAS messages. After start up, if the LOCALE option and LOCALELANGCHG option are set, then the language for messages and ODS templates can change to reflect the LOCALE setting when the localizations are available.

You can enable LOCALELANGCHG but not translate into the language of the locale. For example, if you enable LOCALELANGCHG, then start a SAS session in French and set the locale to Greek, NLDATE displays in Greek. The output displays in French. The output displays in French because SAS does not translate into Greek.

Comparisons

If LOCALELANGCHG is enabled at start up and LOCALE is changed during the session, the ODS PATH is updated to include the translated template item store if it exists for the language of the new locale. Messages that do not appear in the SAS log appear in the language of the new locale. Also log messages appear in the original language of the session locale.

If LOCALELANGCHG is not enabled at start up and LOCALE is changed during the session, ODS output appears in the language that was set at start up.

Example

Example 1 is a French server with LOCALELANGCHG not enabled (NOLOCALELANGCHG).

If a French-client application connects to the server, the output appears in French, and dates, formatted by using the NLDATE format, appear in French. If a German-client application connects to the French server, and the locale is changed to German on the server, then output messages appear in French, and dates formatted with NLDATE appear in German.

Example 2 is a French server with LOCALELANGCHG enabled (LOCALELANGCHG).

If a French-client application connects to the server, the output appears in French, and dates, formatted by using the NLDATE format, appear in French. If a German-client application connects to the French server, and the locale is changed to German on the server, then output messages appear in German, and dates formatted with NLDATE appear in German.

NLSCOMPATMODE System Option: z/OS

Provides national language compatibility with previous releases of SAS.

Valid in: configuration file, SAS invocation

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

Default: NONLSCOMPATMODE

Syntax

NLSCOMPATMODE | NONLSCOMPATMODE

Syntax Description

NLSCOMPATMODE
provides compatibility with previous releases of SAS in order to process data in languages other than English, which is the default language. Programs that ran in previous releases of SAS will continue to work when NLSCOMPATMODE is set.

Note: NLSCOMPATMODE might affect the format of outputs that are produced using ODS. If you are using ODS, set the option value to NONLSCOMPATMODE.

NONLSCOMPATMODE
provides support for data processing using native characters for languages other than English. When NONLSCOMPATMODE is set, character data is processed using the encoding that is specified for the SAS session.

When NONLSCOMPATMODE is in effect, SAS does not support substitution characters in SAS syntax. If you run SAS with NONLSCOMPATMODE, you must update existing programs to use national characters instead of substitution characters. For example, Danish customers who have substituted the 'Å' for the '$' character in existing SAS programs will have to update the SAS syntax to use the '$' in their environments.

Details

The NONLSCOMPATMODE system option is provided for international customers who use non-English encodings and who want to take advantage of emerging industry standards when they are coding new applications.

The NLSCOMPATMODE or NONLSCOMPATMODE settings do not change the value of the LOCALE or ENCODING system options. When NONLSCOMPATMODE is in effect, the encoding that SAS uses to process character data is the encoding that is set by the ENCODING or LOCALE options. Compiler and Session encoding characters remain separate.

Note: In preparation for deprecating the NLSCOMPATMODE option, the following warning will be displayed in the SAS log when NLSCOMPATMODE is set: SAS has been started in NLS compatibility mode with the NLSCOMPATMODE option. This option will be deprecated in a future release of SAS and NLS compatibility mode will no longer be supported. For more information, contact a SAS representative or Technical Support.

PAPERSIZE= System Option

Specifies the paper size for the printer to use.

Valid in: configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

See: PAPERSIZE= System Option in *SAS System Options: Reference*

RSASIOTRANSERROR System Option

Displays a transcoding error when illegal data is read from a remote application.

Valid in: configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Files: SAS files

PROC OPTIONS GROUP= SASFILES

Default: RSASIOTRANSERROR

Syntax

RSASIOTRANSERROR | NORSASIOTRANSERROR

Syntax Description

RSASIOTRANSERROR
specifies to display a transcoding error when illegal values are read from a remote application.

NORSASIOTRANSERROR
specifies not to display a transcoding error when illegal values are read from a remote application.

Details

The RSASIOTRANSERROR system option enables remote users of SASIO, for example SAS Enterprise Guide and SAS Enterprise Miner, to ignore illegal data values. An illegal data value typically will cause a transcoding error when the data is read by a remote application.

SORTSEQ= System Option: UNIX, Windows, and z/OS

Specifies a language-specific collating sequence for the SORT and SQL procedures to use in the current SAS session.

Valid in: configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Sort: Procedure options

PROC OPTIONS GROUP= SORT

Syntax

SORTSEQ=*collating-sequence*

Syntax Description

collating-sequence
specifies the collating sequence that the SORT procedure is to use in the current SAS session. Valid values can be user-supplied, or they can be one of the following:

- ASCII
- DANISH (alias NORWEGIAN)
- EBCDIC
- FINNISH
- ITALIAN
- NATIONAL
- POLISH
- REVERSE
- SPANISH
- SWEDISH

Details

To create or change a collating sequence, use the TRANTAB procedure to create or modify translation tables. When you create your own translation tables, they are stored in your PROFILE catalog, and they override any translation tables with the same name that are stored in the HOST catalog.

Note: System managers can modify the HOST catalog by copying newly created tables from the PROFILE catalog to the HOST catalog. All users can access the new or modified translation tables.

If you are in a windowing environment, use the Explorer window to display the SASHELP HOST catalog. In the HOST catalog, entries of type TRANTAB contain collating sequences that are identified by the entry name.

If you are not in a windowing environment, issue the following statements to generate a list of the contents of the HOST catalog. Collating sequences are entries of the type TRANTAB.

```
proc catalog catalog=sashelp.host;
   contents;
run;
```

To see the contents of a particular translation table, use these statements:

```
proc trantab table=translation-table-name;
   list;
run;
```

The contents of collating sequences are displayed in the SAS log.

Example

This example demonstrates the functionality of SORTSEQ with PROC SORT and PROC SQL:

```
options sortseq=reverse;
proc sort data=sashelp.class out=foo1;
by name;
run;
proc sql;
create table foo2 as select * from sashelp.class order by name;
quit;
run;
```

See Also

- "Collating Sequence" on page 16

System Options:

- "TRANTAB= System Option" on page 486

TRANTAB= System Option

Specifies the translation tables that are used by various parts of SAS.

Valid in: configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

Interaction: The TRANTAB= system option specifies a translation table to use for the SAS session, including file transfers. The TRANTAB statement specifies a customized translation table (for example, to map an EBCDIC character to an ASCII character) to apply to the character set in the SAS file that is being exported or transferred.

Syntax

TRANTAB=(*catalog-entries*)

Syntax Description

catalog-entries
specifies SAS catalog entries that contain translation tables. If you specify *entry-name.type*, SAS searches SASUSER.PROFILE first and then SASUSER.HOST.

Details

TRANTAB= was introduced in SAS 6 to support the requirements of national languages. SAS 8.2 introduced the LOCALE= system option as an improvement on the features of TRANTAB=. SAS 9.2 supports TRANTAB= for backward compatibility. However, using the LOCALE= system option is preferred in later SAS releases.

Translation tables are specified in a list that is enclosed in parentheses and has ten positions. The position in which a table appears in the list determines the type of translation table that is specified. Individual entries in the list are separated by commas. See the list of positions and types that follows:

Position	Type of Translation Table
1st	local-to-transport-format
2nd	transport-to-local-format
3rd	lowercase-to-uppercase
4th	uppercase-to-lowercase
5th	character classification
6th	scanner translation
7th	delta characters
8th	scanner character classification
9th	not used
10th	DBCS user table

CAUTION:
Do not change a translation table unless you are familiar with its purpose. Translation tables are used internally by the SAS supervisor to implement NLS. If you are unfamiliar with the purpose of translation tables, do *not* change the specifications without proper technical advice.

To change one table, specify null entries for the other tables. For example, to change the lowercase-to-uppercase table, which is third in the list, specify uppercase as follows:

```
options trantab = ( , , new-uppercase-table);
```

The other tables remain unchanged. The output from the OPTIONS procedure reflects the last specification for the TRANTAB= option and not the composite specification. Here is an example:

```
options trantab = ( , , new-uppercase-table);
options trantab = ( , , , new-lowercase-table);
```

PROC OPTIONS shows that the value for TRANTAB= is

(, , , *new-lowercase-table*), but both the *new-uppercase* and *new-lowercase* tables are in effect.

See Also

Chapter 17, “TRANTAB Procedure,” on page 533

URLENCODING= System Option

Specifies whether the argument to the URLENCODE function and to the URLDECODE function is interpreted using the SAS session encoding or UTF-8 encoding.

Valid in: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: Environment control: Language control

PROC OPTIONS GROUP= LANGUAGECONTROL

See: “URLENCODING= System Option” in *SAS System Options: Reference*

Syntax

URLENCODING=SESSION | UTF8

VALIDMEMNAME System Option

Specifies the rules for naming SAS data sets, views, and item stores.

Valid in: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: SAS files

PROC OPTIONS GROUP= SASFILES

See: VALIDMEMNAME system option in *SAS System Options: Reference*

Syntax

VALIDMEMNAME=COMPAT | EXTEND

VALIDVARNAME= System Option

Specifies the rules for valid SAS variable names that can be created and processed during a SAS session.

Valid in: Configuration file, SAS invocation, OPTIONS statement, SAS System Options window

Category: SAS files

PROC OPTIONS GROUP= SASFILES

Default: V7

See: "VALIDVARNAME= System Option" in *SAS System Options: Reference*

Syntax

VALIDVARNAME=V7 | UPCASE | ANY

Part 9

Options for Commands, Statements, and Procedures for NLS

Chapter 15

Command, Statement, and Procedure Option Entries

Commands, Statements, and Procedures for NLS by Category

The data set control and data access categories of options for selected SAS statements are affected by NLS. The following table provides brief descriptions of the statement options. For more detailed descriptions, see the dictionary entry for each statement option:

Category	Language elements	Description
Data Access	CVPBYTES=, CVPENGINE=, and CVPMULTIPLIER= Options (p. 502)	Specifies attributes for character variables that are needed in order to transcode a SAS file.
	ENCODING= Option (p. 507)	Overrides and transcodes the encoding for input or output processing of external files.
	INENCODING= and OUTENCODING= Options (p. 511)	Overrides and changes the encoding when reading or writing SAS data sets in the SAS library.

Category	Language elements	Description
	ODSCHARSET= Option (p. 512)	Specifies the character set to be generated in the META declaration for the output.
	ODSTRANTAB= Option (p. 513)	Specifies the translation table to use when transcoding an XML document for an output file.
	RENCODING= Option (p. 515)	Specifies the ASCII-based or EBCDIC-based encoding to use for transcoding data for a SAS/SHARE server session that is using an EBCDICANY or ASCIIANY session encoding.
	XMLENCODING= Option (p. 520)	Overrides the encoding of an XML document to import or export an external document.
Information	TRANSCODE= Option (p. 517)	Specifies an attribute in the ATTRIB statement (which associates a format, informat, label, and length with one or more variables) that indicates whether character variables are to be transcoded.
ODS: Third-Party Formatted	CHARSET= Option (p. 494)	Specifies the character set to be generated in the META declaration for the output.
	TRANTAB= Option (p. 519)	Specifies the translation table to use when you are transcoding character data in a SAS file for the appropriate output file.

Dictionary

CHARSET= Option

Specifies the character set to be generated in the META declaration for the output.

Valid in: LIBNAME statement for the ODS MARKUP and ODS HTML statements

Category: ODS: Third-Party Formatted

Syntax

CHARSET=*character-set* ;

Required Argument

character-set

Specifies the character set to use in the META tag for HTML output.

An example of an encoding is ISO-8859-1. Official character sets for use on the Internet are registered by IANA (Internet Assigned Numbers Authority). IANA is the central registry for various Internet protocol parameters, such as port, protocol and enterprise numbers, and options, codes and types. For a complete list of character-set values, see **`www.unicode.org/reports/tr22/index.html`** and **`www.iana.org/assignments/character-sets`**.

A *character set* is like an *encoding-value* in this context. However, *character set* is the term that is used to identify an encoding that is suitable for use on the Internet.

Example: Generated Output in a META Declaration for an ODS MARKUP Statement

```
<META http-equiv="Content-Type" content="text/html; charset=iso-8858-1">
```

See Also

Conceptual Information:

- "Encoding for NLS" on page 9

Statements:

- "ODS MARKUP Statement" in *SAS Output Delivery System: User's Guide*
- "ODS HTML Statement " in *SAS Output Delivery System: User's Guide*

Collating Sequence Option

Specifies the collating sequence for PROC SORT.

Valid in: PROC SORT statement

Note: The PROC SORT statement sorts observations in a SAS data set by one or more characters or numeric variables.

Syntax

PROC SORT *collating-sequence-option <other option(s)>* ;

Options

Options can include one *collating-sequence-option* and multiple *other options*. The order of the two types of options does not matter and both types are not necessary in the same PROC SORT step. Only the explanations for the PROC SORT collating-sequence-options follow.

Operating Environment Information
For information about behavior specific to your operating environment for the DANISH, FINNISH, NORWEGIAN, or SWEDISH *collating-sequence-option*, see the SAS documentation for your operating environment.

ASCII
sorts character variables using the ASCII collating sequence. You need this option only when you want to achieve an ASCII ordering on a system where EBCDIC is the native collating sequence.

DANISH NORWEGIAN
sorts characters according to the Danish and Norwegian

The Danish and Norwegian collating sequence is shown in Figure 15.1 on page 497.

EBCDIC
sorts character variables using the EBCDIC collating sequence. You need this option only when you want to achieve an EBCDIC ordering on a system where ASCII is the native collating sequence.

POLISH
sorts characters according to the Polish convention.

FINNISH SWEDISH
sorts characters according to the Finnish and Swedish convention. The Finnish and Swedish collating sequence is shown in Figure 15.1 on page 497.

NATIONAL
sorts character variables using an alternate collating sequence, as defined by your installation, to reflect a country's National Use Differences. To use this option, your site must have a customized national sort sequence defined. Check with the SAS Installation Representative at your site to determine whether a customized national sort sequence is available.

NORWEGIAN
See DANISH

SWEDISH
See FINNISH

SORTSEQ=*collating-sequence*
specifies the collating sequence. The *collating-sequence* can be a collating-sequence-option, a translation table, an encoding, or the keyword LINGUISTIC. Only one collating sequence can be specified. For detailed information, refer to "Collating Sequence" on page 16.

Here are descriptions of the collating sequences:

collating—sequence—option | *translation_table*
specifies either a translation table, which can be one that SAS provides or any user-defined translation table, or one of the PROC SORT statement Collating-Sequence-Options. For an example of using PROC TRANTAB and PROC SORT with SORTSEQ=, see "Example 6: Using Different Translation Tables for Sorting" on page 552.

The available translation tables are

- ASCII
- DANISH
- EBCDIC
- FINNISH
- ITALIAN
- NORWEGIAN
- POLISH
- REVERSE
- SPANISH
- SWEDISH

The following figure shows how the alphanumeric characters in each language will sort:

Figure 15.1 *Alphanumeric Characters Sorted for Each Language*

```
Danish:     0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZÆØÅabcdefghijklmnopqrstuvwxyzæøå
Finnish:    0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZÅÄÖabcdefghijklmnopqrstuvwxyzåäö
Italian:    0123456789AÀBCÇDEÉÈFGHIÌJKLMNOÒPQRSTUÙVWXYZaàbcçdeéèfghiìjklmnoòpqrstuùvwxyz
Norwegian:  0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZÆØÅabcdefghijklmnopqrstuvwxyzæøå
Spanish:    0123456789AÁaáBbCcDdEÉeéFfGgHhIÍiíJjKkLlMmNnÑñOÓoóPpQqRrSsTtUÚuúÜüVvWwXxYyZz
Swedish:    0123456789ABCDEFGHIJKLMNOPQRSTUVWXYZÅÄÖabcdefghijklmnopqrstuvwxyzåäö
```

Restriction: You can specify only one collating-sequence-option in a PROC SORT step.

Tip: The SORTSEQ= collating sequence options are specified without parenthesis and have no arguments associated with them. An example of how to specify a collating sequence follows: **`proc sort data=mydata SORTSEQ=ASCII;`**

encoding-value
specifies an encoding value. The result is the same as a binary collation of the character data represented in the specified encoding. See the supported encoding values in "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

Restriction: PROC SORT is the only procedure or part of the SAS system that recognizes an encoding specified for the SORTSEQ= option.

Tip: When the encoding value contains a character other than an alphanumeric character or underscore, the value needs to be enclosed in quotation marks.

See: The list of the encodings that can be specified in "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

LINGUISTIC<*(collating—rules)*>
specifies linguistic collation, which sorts characters according to rules of the specified language. The rules and default collating sequence options are based on the language specified in the current locale setting. The implementation is provided by the International Components for Unicode (ICU) library and produces results that are largely compatible with the Unicode Collation Algorithms (UCA).

Alias: UCA

Restriction: The SORTSEQ=LINGUISTIC option is available only on the PROC SORT SORTSEQ= option and is not available for the SAS System SORTSEQ= option.

Tips:

LINGUISTIC sorting requires more memory with the z/OS mainframe. You might need to set your REGION to 50M or higher. This action must be done in JCL, if you are running in batch mode, or in the VERIFY screen if you are running interactively. This action allows the ICU libraries to load properly and does not affect the memory that is used for sorting.

The collating-rules must be enclosed in parentheses. More than one collating rule can be specified.

When BY processing is performed on data sets that are sorted with linguistic collation, the NOBYSORTED system option might need to be specified in order for the data set to be treated properly. BY processing is performed differently than collating sequence processing.

See:

The Appendix 4, "ICU License - ICU 1.8.1 and later," in *Base SAS Procedures Guide*

The "Collating Sequence" on page 16 for detailed information about linguistic collation.

Refer to *http://www.unicode.org* Web site for the Unicode Collation Algorithm (UCA) specification.

The following are the collation-rules that can be specified for the LINGUISTIC option. These rules modify the linguistic collating sequence:

ALTERNATE_HANDLING=SHIFTED
controls the handling of variable characters like spaces, punctuation, and symbols. When this option is not specified (using the default value Non-Ignorable), differences among these variable characters are of the same importance as differences among letters. If the ALTERNATE_HANDLING option is specified, these variable characters are of minor importance.

Default: NON_IGNORABLE

Tip: The SHIFTED value is often used in combination with STRENGTH= set to Quaternary. In such a case, whitespace characters, punctuation, and symbols are considered when comparing strings, but only if all other aspects of the strings (base letters, accents, and case) are identical.

CASE_FIRST=
specify order of uppercase and lowercase letters. This argument is valid for only TERTIARY, QUATERNARY, or IDENTICAL levels. The following table provides the values and information for the CASE_FIRST argument:

Value	Description
UPPER	Sorts uppercase letters first, then the lowercase letters.
LOWER	Sorts lowercase letters first, then the uppercase letters.

COLLATION=
The following table lists the available COLLATION= values: If you do not select a collation value, then the user's locale-default collation is selected.

Value	Description
BIG5HAN	specifies Pinyin ordering for Latin and specifies big5 charset ordering for Chinese, Japanese, and Korean characters.
DIRECT	specifies a Hindi variant.
GB2312HAN	specifies Pinyin ordering for Latin and specifies gb2312han charset ordering for Chinese, Japanese, and Korean characters.
PHONEBOOK	specifies a telephone-book style for ordering of characters. Select PHONEBOOK only with the German language.

Value	Description
PINYIN	specifies an ordering for Chinese, Japanese, and Korean characters based on character-by-character transliteration into Pinyin.This ordering is typically used with simplified Chinese.
POSIX	is the Portable Operating System Interface. This option specifies a "C" locale ordering of characters.
STROKE	specifies a nonalphabetic writing style ordering of characters. Select STROKE with Chinese, Japanese, Korean, or Vietnamese languages. This ordering is typically used with Traditional Chinese.
TRADITIONAL	specifies a traditional style for ordering of characters. For example, select TRADITIONAL with the Spanish language.

LOCALE=locale_name
specifies the locale name in the form of a POSIX name. For example, ja_JP. See the "LOCALE= Values and Default Settings for ENCODING, PAPERSIZE, DFLANG, and DATESTYLE Options" on page 561 for a list of locale and POSIX values supported by PROC SORT.

Restriction: The following locales are not supported by PROC SORT:

- Afrikaans_SouthAfrica, af_ZA
- Cornish_UnitedKingdom, kw_GB
- ManxGaelic_UnitedKingdom, gv_GB

NUMERIC_COLLATION=
orders integer values within the text by the numeric value instead of characters used to represent the numbers.

Value	Description
ON	Order numbers by the numeric value. For example, "8 Main St." would sort before "45 Main St.".
OFF	Order numbers by the character value. For example, "45 Main St." would sort before "8 Main St.".

Default: OFF

STRENGTH=
The value of strength is related to the collation level. There are five collation-level values. The following table provides information about the five levels. The default value for strength is related to the locale.

Value	Type of Collation	Description
PRIMARY or 1	PRIMARY specifies differences between base characters (for example, "a" < "b").	It is the strongest difference. For example, dictionaries are divided into different sections by base character.
SECONDARY or 2	Accents in the characters are considered secondary differences (for example, "as" < "às" < "at").	A secondary difference is ignored when there is a primary difference anywhere in the strings. Other differences between letters can also be considered secondary differences, depending on the language.
TERTIARY or 3	Upper and lowercase differences in characters are distinguished at the tertiary level (for example, "ao" < "Ao" < "aò").	A tertiary difference is ignored when there is a primary or secondary difference anywhere in the strings. Another example is the difference between large and small Kana.
QUATERNARY or 4	When punctuation is ignored at level 1-3, an additional level can be used to distinguish words with and without punctuation (for example, "ab" < "a-b" < "aB").	The quaternary level should be used if ignoring punctuation is required or when processing Japanese text. This difference is ignored when there is a primary, secondary or tertiary difference.
IDENTICAL or 5	When all other levels are equal, the identical level is used as a tiebreaker. The Unicode code point values of the Normalization Form D (NFD) form of each string are compared at this level, just in case there is no difference at levels 1-4.	This level should be used sparingly, as only code point values differences between two strings is an extremely rare occurrence. For example, only Hebrew cantillation marks are distinguished at this level.

Alias: Level=

CAUTION:

If you use a host sort utility to sort your data, then specifying a translation table based collating sequence with the SORTSEQ= option might corrupt the character BY variables. For more information, see the PROC SORT documentation for your operating environment.

Details

The collating sequence option in the PROC SORT statement sorts observations in a SAS data set by one or more characters or numeric variables.

Table 15.1 *Options*

Task	Option
Specify the collating sequence	

Task	Option
Specify ASCII	ASCII on page 495
Specify EBCDIC	EBCDIC on page 496
Specify Danish	DANISH on page 495
Specify Finnish	FINNISH on page 496
Specify Norwegian	NORWEGIAN on page 495
Specify Polish	POLISH on page 496
Specify Swedish	SWEDISH on page 496
Specify a customized sequence	NATIONAL on page 496
Specify any of the collating sequences listed above (ASCII, EBCDIC, DANISH, FINNISH, ITALIAN, NORWEGIAN, POLISH, SPANISH, SWEDISH, or NATIONAL), the name of any other system provided translation table (POLISH, SPANISH), and the name of a user-created translation table. You can specify an encoding. You can also specify either the keyword LINGUISTIC or UCA to achieve a locale-appropriate collating sequence.	SORTSEQ= on page 496

See Also

- "Collating Sequence" on page 16
- Chapter 48, "SORT Procedure" in *Base SAS Procedures Guide*

System Options:

- "SORTSEQ= System Option: UNIX, Windows, and z/OS" on page 485
- "TRANTAB= System Option" on page 486

CORRECTENCODING= Option

Explicitly changes the encoding attribute of a SAS file to match the encoding of the data in the SAS file.

Valid in: MODIFY statement of the DATASETS procedure

Syntax

MODIFY *SAS file* </<CORRECTENCODING=*encoding-value*>> ;

Optional Argument

</ <CORRECTENCODING=*encoding-value*> >
enables you to change the encoding indicator, which is recorded in the file's descriptor information, in order to match the actual encoding of the file's data. You cannot use this option in parenthesis after the name of each SAS file; you must specify CORRECTENCODING= after the forward slash. For example:

```
modify mydata / correctencoding=latin2;
```

For a list of valid encoding values for transcoding, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577 .

Restriction: CORRECTENCODING= can be used only when the SAS file uses the default base engine, which is V9 in SAS 9.

Example: Using the CORRECTENCODING= Option to Resolve a SAS Session Encoding and a SAS File Encoding

A file's encoding indicator can be different from the data's encoding. For example, a SAS file that was created before SAS 9 has no encoding indicator stored on the file. If such a SAS file that has no recorded encoding is opened in a SAS 9 session, SAS assigns the encoding of the current session. For example, if the encoding of the data is Danish EBCDIC, but the encoding for the current session is Western Wlatin1, then the actual encoding of the file's data and the encoding indicator that is stored in the file's descriptor information do not match. When this action occurs, the data does not transcode correctly and could result in unreadable output. The following MODIFY statement would resolve the problem by explicitly assigning an EDCDIC encoding:

Note: CEDA creates a read-only copy. You need to copy the data with PROC COPY or a DATA step to transcode the data permanently.

```
proc datasets library=myfiles;
   modify olddata / correctencoding=ebcdic1142;
quit;
```

CVPBYTES=, CVPENGINE=, and CVPMULTIPLIER= Options

Specifies attributes for character variables that are needed in order to transcode a SAS file.

Valid in:	LIBNAME statement
Category:	Data Access
PROC OPTIONS GROUP=	LIBNAME statement under Windows, UNIX, and Z/OS in the documentation for your operating environment.
See:	LIBNAME, SAS/ACCESS

Syntax

LIBNAME *libref* <CVPBYTES=*bytes*> <CVPENGINE=*engine*> <CVPMULTIPLIER=*multiplier* > '*SAS data-library*';

Optional Arguments

CVPBYTES=*bytes*

specifies the number of bytes by which to expand character variable lengths when processing a SAS data file that requires transcoding. The CVP engine expands the lengths so that character data truncation does not occur. The lengths for character variables are increased by adding the specified value to the current length. You can specify a value from 0 to 32766.

For example, the following LIBNAME statement implicitly assigns the CVP engine by specifying the CVPBYTES= option.

```
libname expand 'SAS data-library' cvpbytes=5;
```

Character variable lengths are increased by adding 5 bytes. A character variable with a length of 10 is increased to 15, and a character variable with a length of 100 is increased to 105.

Default: If you specify CVPBYTES=, SAS automatically uses the CVP engine in order to expand the character variable lengths according to your specification. If you explicitly assign the CVP engine but do not specify either CVPBYTES= or CVPMULTIPLIER=, then SAS uses CVPMULTIPLIER=1.5 to increase the lengths of the character variables.

Restrictions:

The CVP engine supports SAS data files only; that is, no SAS views, catalogs, item stores, and so on.

The CVP engine is available for input (read) processing only.

For library concatenation with mixed engines that include the CVP engine, only SAS data files are processed. For example, if you execute the COPY procedure, only SAS data files are copied.

Requirement: The number of bytes that you specify must be large enough to accommodate any expansion. Otherwise, truncation will still occur, which results in an error message in the SAS log.

Interaction: You cannot specify both CVPBYTES= and CVPMULTIPLIER=. Specify one of these options.

See: "Avoiding Character Data Truncation by Using the CVP Engine" on page 34

CVPENGINE=*engine*

specifies the engine to use in order to process a SAS data file that requires transcoding. The CVP engine expands the character variable lengths to transcoding so that character data truncation does not occur. Then the specified engine does the actual file processing.

Alias: CVPENG

Default: SAS uses the default SAS engine.

See: "Avoiding Character Data Truncation by Using the CVP Engine" on page 34

CVPMULTIPLIER=*multiplier*

specifies a multiplier value in order to expand character variable lengths when you are processing a SAS data file that requires transcoding. The CVP engine expands the lengths so that character data truncation does not occur. The lengths for character variables are increased by multiplying the current length by the specified value. You can specify a multiplier value from 1 to 5.

For example, the following LIBNAME statement implicitly assigns the CVP engine by specifying the CVPMULTIPLIER= option.

```
libname expand 'SAS data-library' cvpmultiplier=2.5;
```

Character variable lengths are increased by multiplying the lengths by 2.5. A character variable with a length of 10 is increased to 25, and a character variable with a length of 100 is increased to 250.

Alias: CVPMULT

Default: If you specify CVPMULTIPLIER=, SAS automatically uses the CVP engine in order to expand the character variable lengths according to your specification. If you explicitly specify the CVP engine but do not specify either CVPMULTIPLIER= or CVPBYTES=, then SAS uses CVPMULTIPLIER=1.5 to increase the lengths.

Restrictions:

The CVP engine supports SAS data files only; that is, no SAS views, catalogs, item stores, and so on.

The CVP engine is available for input (read) processing only.

For library concatenation with mixed engines that include the CVP engine, only SAS data files are processed. For example, if you execute the COPY procedure, only SAS data files are copied.

Requirement: The number of bytes that you specify must be large enough to accommodate any expansion. Otherwise, truncation will still occur, which results in an error in the SAS log.

Interaction: You cannot specify both CVPMULTIPLIER= and CVPBYTES=. Specify one of these options.

See: "Avoiding Character Data Truncation by Using the CVP Engine" on page 34

Example: Using the CVP (Character Variable Padding) Engine

The following example illustrates how to avoid character data truncation by using the CVP engine. The example uses a SAS data set named MYFILES.WLATIN2, which contains some national characters in Wlatin2 encoding.

```
libname myfiles 'C:\Documents and Settings\sasdxw\My Documents\myfiles';
data myfiles.wlatin2 (encoding=wlatin2);
   var1='41'x;
   var2='8a'x;
   var3='9c'x;
   var4='b3'x;
;
proc print data=myfiles.wlatin2;
run;
```

The SAS System

Obs	var1	var2	var3	var4
1	A	Š	œ	³

Here is PROC CONTENTS output for MYFILES.WLATIN2, which shows that the encoding is Wlatin2 and that the length for each character variable is 1 byte:

Output 15.1 *PROC CONTENTS Output for MYFILES.WLATIN2*

```
                                    The SAS
System                                      1
                                  The CONTENTS Procedure
     Data Set Name        MYFILES.WLATIN2
Observations          1
     Member Type          DATA
Variables             4
     Engine               V9
Indexes               0
     Created              Thursday, November 07, 2003 02:02:36     Observation
Length    4
     Last Modified        Thursday, November 07, 2003 02:02:36     Deleted
Observations  0
     Protection
Compressed            NO
     Data Set Type
Sorted                NO
     Label
     Data Representation  WINDOWS_32
     Encoding             wlatin2  Central Europe (Windows)
                                Engine/Host Dependent Information
     Data Set Page Size          4096
     Number of Data Set Pages    1
     First Data Page             1
     Max Obs per Page            987
     Obs in First Data Page      1
     Number of Data Set Repairs  0
     File Name                   C:\Documents and Settings\xxxxxx\My
                                 Documents\myfiles\wlatin2.sas7bdat
     Release Created             9.0100A0
     Host Created                XP_PRO
                          Alphabetic List of Variables and Attributes
                                 #    Variable    Type    Len
                                 1    Var1        Char      1
                                 2    Var2        Char      1
                                 3    Var3        Char      1
                                 4    Var4        Char      1
```

The following code is executed with the session encoding Wlatin2.

```
options msglevel=i;
libname myfiles 'SAS data-library';
data myfiles.utf8 (encoding="utf-8");
   set myfiles.wlatin2;
run;
```

The DATA step requests a new data set named MYFILES.UTF8, and requests that the data be read into the new data set in UTF-8 encoding, which means that the data must be transcoded from Wlatin2 to UTF-8. The request results in errors due to character data truncation that occurs from the transcoding. The new data set MYFILES.UTF8 is created but does not contain any data.

Log 15.1 *SAS Log with Transcoding Error*

```
   1    options msglevel=i;
   2    libname myfiles 'C:\Documents and Settings\xxxxxx\My Documents\myfiles';
   NOTE: Libref MYFILES was successfully assigned as follows:
         Engine:        V9
         Physical Name: C:\Documents and Settings\xxxxxx\My Documents\myfiles
   3    data myfiles.utf8 (encoding="utf-8");
   4       set myfiles.wlatin2;
   5    run;
INFO: Data file MYFILES.UTF8.DATA is in a format native to another
host or the file encoding does not match the session encoding.
Cross Environment Data Access will be used, which may require additional
CPU resources and reduce performance.
   ERROR: Some character data was lost during transcoding in the data set
MYFILES.UTF8.
   NOTE: The data step has been abnormally terminated.
   NOTE: The SAS System stopped processing this step because of errors.
   NOTE: There were 1 observations read from the data set MYFILES.WLATIN2.
   WARNING: The data set MYFILES.UTF8 may be incomplete.  When this step was
stopped there were 0
            observations and 4 variables.
```

The following code is executed again with the session encoding Wlatin2.

```
options msglevel=i;
libname myfiles 'SAS data-library';
libname expand cvp 'SAS data-library' cvpbytes=2;
data myfiles.utf8 (encoding="utf-8");
   set expand.wlatin2;
run;
```

In this example, the CVP engine is used to expand character variable lengths by adding two bytes to each length. The data is read into the new file in UTF-8 encoding by transcoding from Wlatin2 to UTF-8. There is no data truncation due to the expanded character variable lengths, and the new data set is successfully created:

Log 15.2 *SAS Log Output for MYFILES.UTF8*

```
   12   options msglevel=i;
   13   libname myfiles 'C:\Documents and Settings\xxxxxx\My Documents\myfiles';
   NOTE: Directory for library MYFILES contains files of mixed engine types.
   NOTE: Libref MYFILES was successfully assigned as follows:
         Engine:        V9
         Physical Name: C:\Documents and Settings\xxxxxx\My Documents\myfiles
   14   libname expand cvp 'C:\Documents and Settings\xxxxxx\My Documents
\myfiles' cvpbytes=2;
   WARNING: Libname EXPAND refers to the same physical library as MYFILES.
   NOTE: Libref EXPAND was successfully assigned as follows:
         Engine:        CVP
         Physical Name: C:\Documents and Settings\xxxxxx\My Documents\myfiles
   15   data myfiles.utf8 (encoding="utf-8");
   16      set expand.wlatin2;
   17   run;
INFO: Data file MYFILES.UTF8.DATA is in a format native to another
host or the file encoding does not match the session encoding.
Cross Environment Data Access will be used, which may require additional
CPU resources and reduce performance.
   NOTE: There were 1 observations read from the data set EXPAND.WLATIN2.
   NOTE: The data set MYFILES.UTF8 has 1 observations and 4 variables.
```

Finally, here is PROC CONTENTS output for MYFILES.UTF8 showing that it is in UTF-8 encoding and that the length of each character variable is 3:

Output 15.2 *PROC CONTENTS Output for MYFILES.UTF8*

```
                                        The SAS
System                                        1
                                    The CONTENTS Procedure
     Data Set Name        MYFILES.UTF8
Observations          1
     Member Type          DATA
Variables             4
     Engine               V9
Indexes               0
     Created              Thursday, November 07, 2003 02:40:34     Observation
Length    12
     Last Modified        Thursday, November 07, 2003 02:40:34     Deleted
Observations  0
     Protection
Compressed            NO
     Data Set Type
Sorted                NO
     Label
     Data Representation  WINDOWS_32
     Encoding             utf-8  Unicode (UTF-8)
                                Engine/Host Dependent Information
     Data Set Page Size          4096
     Number of Data Set Pages    1
     First Data Page             1
     Max Obs per Page            335
     Obs in First Data Page      1
     Number of Data Set Repairs  0
     File Name                   C:\Documents and Settings\xxxxxx\My Documents
\myfiles\utf8.sas7bdat
     Release Created             9.0100A0
     Host Created                XP_PRO
                          Alphabetic List of Variables and Attributes
                                 #    Variable    Type    Len
                                 1    Var1        Char      3
                                 2    Var2        Char      3
                                 3    Var3        Char      3
                                 4    Var4        Char      3
```

ENCODING= Option

Overrides and transcodes the encoding for input or output processing of external files.

Valid in: %INCLUDE statement; FILE statement; FILENAME statement; FILENAME statement, EMAIL (SMTP) Access Method; INFILE statement; ODS statements; FILE command; INCLUDE command

Category: Data Access

Syntax

ENCODING= '*encoding-value*'

Optional Argument

ENCODING= '*encoding-value*'

specifies the encoding to use for reading, writing, copying, or saving an external file. The value for ENCODING= indicates that the external file has a different encoding from the current session encoding.

When you read, write, copy, or save data using an external file, SAS transcodes the data from the session encoding to the specified encoding.

For details, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

Default: SAS uses the current session encoding.

Details

The following table provides information about how the ENCODING option is used with the corresponding statement:

%INCLUDE statement:	reads SAS statements and data lines from the specified source file (not supported under z/OS).
FILE statement:	writes to an external file.
FILENAME statement:	reads from or writes to an external file.
FILENAME statement, EMAIL (SMTP) Access Method:	sends electronic mail programmatically.
INFILE statement:	reads from an external file.
ODS statements:	controls features of the Output Delivery System that are used to generate, store, or reproduce SAS procedure and DATA step output.
FILE command:	saves the contents of a window to an external file.
INCLUDE command:	Copies an external file into the current window.

Some encodings use a Byte Order Mark (BOM). The BOM is generated when the encoding is specified. For the UTF-8 encoding, you must specify *encoding=utf-8* on the filename and file DATA step statements in order for the BOM to be generated.

Examples

Example 1: Using the FILE Statement to Specify an Encoding for Writing to an External File

This example creates an external file from a SAS data set. The current session encoding is Wlatin1, but the external file's encoding needs to be UTF-8. By default, SAS writes the external file using the current session encoding.

To specify what encoding to use for writing data to the external file, specify the ENCODING= option:

```
libname myfiles 'SAS data-library';
filename outfile 'external-file';
data _null_;
   set myfiles.cars;
   file outfile encoding="utf-8";
   put Make Model Year;
run;
```

When you tell SAS that the external file is to be in UTF-8 encoding, SAS then transcodes the data from Wlatin1 to the specified UTF-8 encoding.

Example 2: Using the FILENAME Statement to Specify an Encoding for Reading an External File

This example creates a SAS data set from an external file. The external file is in UTF-8 character-set encoding, and the current SAS session is in the Wlatin1 encoding. By default, SAS assumes that an external file is in the same encoding as the session encoding, which causes the character data to be written to the new SAS data set incorrectly.

To specify which encoding to use when reading the external file, specify the ENCODING= option:

```
libname myfiles  'SAS data-library';

filename extfile 'external-file' encoding="utf-8";
data myfiles.unicode;
   infile extfile;
   input Make $ Model $ Year;
run;
```

When you specify that the external file is in UTF-8, SAS then transcodes the external file from UTF-8 to the current session encoding when writing to the new SAS data set. Therefore, the data is written to the new data set correctly in Wlatin1.

Example 3: Using the FILENAME Statement to Specify an Encoding for Writing to an External File

This example creates an external file from a SAS data set. By default, SAS writes the external file using the current session encoding. The current session encoding is Wlatin1, but the external file's encoding needs to be UTF-8.

To specify which encoding to use when writing data to the external file, specify the ENCODING= option:

```
libname myfiles  'SAS data-library';
filename outfile 'external-file' encoding="utf-8";
data _null_;
   set myfiles.cars;
   file outfile;
   put Make Model Year;
run;
```

When you specify that the external file is to be in UTF-8 encoding, SAS then transcodes the data from Wlatin1 to the specified UTF-8 encoding when writing to the external file.

Example 4: Changing Encoding for Message Body and Attachment

This example illustrates how to change text encoding for the message body as well as for the attachment.

```
filename mymail email 'Joe.Developer@sas.com';
data _null_;
   file mymail
      subject='Text Encoding'
      encoding=greek
      attach=('C:\My Files\Test.out'
         content_type='text/plain'
         encoding='ebcdic1047'
         outencoding='latin1');
run;
```

In the program, the following occurs:

- The ENCODING= e-mail option specifies that the message body will be encoded to Greek (ISO) before being sent.
- For the ATTACH= e-mail option, the attachment option ENCODING= specifies the encoding of the attachment that is read into SAS, which is Western (EBCDIC).
- Because SMTP and other e-mail interfaces do not support EBCDIC, the attachment option OUTENCODING= converts the attachment to Western (ISO) before sending it.

Example 5: Using the INFILE= Statement to Specify an Encoding for Reading from an External File

This example creates a SAS data set from an external file. The external file's encoding is in UTF-8, and the current SAS session encoding is Wlatin1. By default, SAS assumes that the external file is in the same encoding as the session encoding, which causes the character data to be written to the new SAS data set incorrectly.

To specify which encoding to use when reading the external file, specify the ENCODING= option:

```
libname myfiles 'SAS data-library';
filename extfile 'external-file';
data myfiles.unicode;
   infile extfile encoding="utf-8";
   input Make $ Model $ Year;
run;
```

When you specify that the external file is in UTF-8, SAS then transcodes the external file from UTF-8 to the current session encoding when writing to the new SAS data set. Therefore, the data is written to the new data set correctly in Wlatin1.

See Also

Statements:

- “%INCLUDE Statement: UNIX” in *SAS Companion for UNIX Environments*
- “%INCLUDE Statement: Windows” in *SAS Companion for Windows*
- “FILE Statement” in *SAS Statements: Reference*
- “FILENAME Statement” in *SAS Statements: Reference*
- “INFILE Statement” in *SAS Statements: Reference*

Commands:

- "FILE Command" in *SAS Companion for z/OS*
- "FILE Command: UNIX" in *SAS Companion for UNIX Environments*
- "FILE Command: Windows" in *SAS Companion for Windows*
- "INCLUDE Command" in *SAS Companion for z/OS*
- "INCLUDE Command: Windows" in *SAS Companion for Windows*

INENCODING= and OUTENCODING= Options

Overrides and changes the encoding when reading or writing SAS data sets in the SAS library.

Valid in: LIBNAME statement

Category: Data Access

Syntax

INENCODING= ANY | ASCIIANY | EBCDICANY | *encoding-value*

OUTENCODING= ANY | ASCIIANY | EBCDICANY | *encoding-value*

Syntax Description

ANY
specifies no transcoding between ASCII and EBCDIC encodings.

NOTE: ANY is a synonym for binary. Because the data is binary, the actual encoding is irrelevant.

ASCIIANY
specifies that no transcoding occurs, assuming that the mixed encodings are ASCII encodings.

EBCDICANY
specifies that no transcoding occurs, assuming that the mixed encodings are EBCDIC encodings.

encoding-value
specifies an encoding value. For a list of encoding values, see "Encoding Values for a SAS Session" on page 587.

Details

The INENCODING= option is used to read SAS data sets in the SAS library. The OUTENCODING= option is used to write SAS data sets in the SAS library.

The INENCODING= or the OUTENCODING= value is written to the SAS log when you use the LIST argument.

INENCODING= and OUTENCODING= are most appropriate when using an existing library that contains mixed encodings. To read a library that contains mixed encodings, you can set INENCODING= to ASCIIANY or EBCDICANY. To write a separate data set, you can use OUTENCODING= to specify a specific encoding, which is applied to the data set when it is created.

Comparisons

- Session encoding is specified using the ENCODING= system option or the LOCALE= system option. Each operating environment has a default encoding.
- You can specify the encoding for reading data sets in a SAS library by using the LIBNAME statement INENCODING= option for input files. If both the LIBNAME statement option and the ENCODING= data set option are specified, SAS uses the data set option.
- You can specify the encoding for writing data sets to a SAS library by using the LIBNAME statement OUTENCODING= option for output files. If both the LIBNAME statement option and the ENCODING= data set option are specified, SAS uses the data set option.
- For the COPY procedure, the default CLONE option uses the encoding attribute of the input data set instead of the encoding value specified on the OUTENCODING= option. For more information about CLONE and NOCLONE, see COPY Statement.

  Note: This interaction does not apply when using SAS/CONNECT or SAS/SHARE.

See Also

- "Overview: Encoding for NLS" on page 9

Statements:

- "LIBNAME Statement" in *SAS Statements: Reference*

System Options:

- "ENCODING System Option: UNIX, Windows, and z/OS" on page 476
- "LOCALE System Option" on page 480

Data Set Options:

- "ENCODING= Data Set Option" on page 49

ODSCHARSET= Option

Specifies the character set to be generated in the META declaration for the output.

Valid in: LIBNAME statement for the XML engine

Category: Data Access

Syntax

ODSCHARSET=*character-set*;

Required Argument

character-set
For the LIBNAME statement for the XML engine, specifies the character set to use in the ENCODING= attribute.

An example of an encoding is ISO-8859-1. Official character sets for use on the Internet are registered by IANA (Internet Assigned Numbers Authority). IANA is the central registry for various Internet protocol parameters, such as port, protocol and enterprise numbers, options, codes and types. For a complete list of character-set values, see **www.unicode.org/reports/tr22/index.html** and **www.iana.org/assignments/character-sets**.

A *character set* is like an *encoding-value* in this context. However, *character set* is the term that is used to identify an encoding that is suitable for use on the Internet.

Details

An XML declaration is not required in all XML documents. Such a declaration is required only when the character encoding of the document is other than the default UTF-8 or UTF-16 and no encoding was determined by a higher-level protocol.

The ODSCHARSET option, in the LIBNAME statement for the XML engine, specifies the character set to use for generating an output XML document.

See Also

Conceptual Information:

- "Encoding for NLS" on page 9

Statements:

- *SAS XML LIBNAME Engine: User's Guide*

ODSTRANTAB= Option

Specifies the translation table to use when transcoding an XML document for an output file.

Valid in: the LIBNAME statement for the XML engine

Category: Data Access

Syntax

TRANTAB ='*translation-table*'

Optional Argument

translation-table
specifies the translation table to use for the output file. The translation table is an encoding method that maps characters (letters, logograms, digits, punctuation, symbols, control characters, and so on) in the character set to numeric values. An example of a translation table is one that converts characters from EBCDIC to ASCII-ISO. The *table-name* can be any translation table that SAS provides, or any user-defined translation table. The value must be the name of a SAS catalog entry in either the SASUSER.PROFILE catalog or the SASHELP.HOST catalog.

Details

For SAS 9.2, using the ODSTRANTAB= option in the LIBNAME statement for the XML Engine is supported for backward compatibility. The preferred method for specifying an encoding is to use the LOCALE= system option.

See Also

Conceptual Information:

- "Transcoding and Translation Tables" on page 28
- Conceptual discussion of "Locale for NLS" on page 5

System Options:

- "TRANTAB= System Option" on page 486
- "LOCALE System Option" on page 480

Procedures:

- Chapter 17, "TRANTAB Procedure," on page 533

Statements:

- *SAS XML LIBNAME Engine: User's Guide*

TRANSCODE= Column Modifier on PROC SQL

Specifies whether values can be transcoded for character columns.

Valid in: Column modifier component in the SQL Procedure

Syntax

TRANSCODE=YES|NO

Required Argument

TRANSCODE=YES|NO

for character columns, specifies whether values can be transcoded. Use TRANSCODE=NO to suppress transcoding. Note that when you create a table using the CREATE TABLE AS statement, the transcoding attribute for a particular character column in the created table is the same as it is in the source table unless you change it with the TRANSCODE= column modifier.

Default: YES

Restriction: Suppression of transcoding is not supported for the V6TAPE engine.

See Also

- "Transcoding for NLS" on page 27
- *Base SAS Procedures Guide*

RENCODING= Option

Specifies the ASCII-based or EBCDIC-based encoding to use for transcoding data for a SAS/SHARE server session that is using an EBCDICANY or ASCIIANY session encoding.

Valid in: LIBNAME statement for SAS/SHARE only

Category: Data Access

Note: The RENCODING= option in the LIBNAME statement is relevant only if using a SAS/SHARE server that has a session encoding set to EBCDICANY or ASCIIANY to preserve a mixed-encoding computing environment, which was more common before SAS 9.

See: LIBNAME statement in *SAS/SHARE User's Guide*

Syntax

RENCODING=*ASCII-encoding-value* | *EBCDIC-encoding-value*

Syntax Description

ASCII-encoding-value
For a list of valid values for ASCII encodings for UNIX and Windows, see "Encoding Values for a SAS Session" on page 587.

EBCDIC-encoding-value
For a list of valid values for EBCDIC encodings for z/OS, see "Encoding Values for a SAS Session" on page 587.

Details

If you use SAS/SHARE in a mixed-encoding environment (for example, SAS/SHARE client sessions using incompatible encodings such as Latin1 and Latin2), you can set the following options:

- in the SAS/SHARE server session, set the SAS system option ENCODING=EBCDICANY or ENCODING=ASCIIANY
- in the SAS/SHARE client session, set the RENCODING= option in the LIBNAME statement(s) under these conditions:
  - a client session that uses an ASCII-based encoding accesses an EBCDICANY server
  - a client session that uses an EBCDIC- based encoding accesses an ASCIIANY server.

  The RENCODING= option enables SAS/SHARE clients to specify which encoding to assume the server's data is in when transcoding to or from the client session encoding.

For SAS 9 and 9.2, if you are processing data in a SAS/SHARE client/server session from more than one SBCS or DBCS encoding, you are advised to use the UTF8 encoding. For more information about Unicode servers that run the UTF8 session encoding, go to **`http://rnd.sas.com/sites/i18n/i18ndocs/i18nsupport/Pages/SAS%20Technical%20Papers.aspx`** and search for *SAS 9.1.3 Service Pack*

4 in a Unicode Environment and *Processing Multilingual Data with the SAS® 9.2 Unicode Server*.

Comparisons

In SAS 9 and 9.2, you can maintain multilingual data that contains characters from more than one traditional SBCS or DBCS encoding in a SAS data set by using a UTF8 encoding. To share update access to that data using SAS/SHARE, you must also run the SAS/SHARE server using a session encoding of UTF8. SAS will transcode the data to the client encoding if necessary.

Before SAS 9, if a SAS/SHARE client and a SAS/SHARE server ran on common architectures (for example, the client and server ran on UNIX machines), there was no automatic transcoding of character data. It was possible to build applications that accessed data sets in different EBCDIC or ASCII encodings within a single SAS/SHARE server, or that accessed data sets in mixed different encodings within a single data set. This method was very uncommon and required careful programming to set up transcoding tables from clients that ran in different operating environments.

The following steps describe how you can maintain mixed encoding in SAS 9, if necessary.

- The SAS/SHARE server must run by using a session encoding of EBCDICANY for mixed-EBCDIC encodings or ASCIIANY for mixed-ASCII encodings.

  This will restore the behavior of Version 8 and earlier releases and prevent the automatic character transcoding between different client and server encodings in the same EBCDIC or ASCII family. That is, no transcoding will occur under these circumstances:

  - if the client session encoding is an EBCDIC encoding and the server session encoding is EBCDICANY
  - if the client session encoding is an ASCII encoding and the server session encoding is ASCIIANY.

- A SAS/SHARE client that does not share the same encoding family as an ASCIIANY or EBCDICANY server can control the necessary transcoding by using an RENCODING= option on the first LIBNAME statement that accesses the server.

  For example, an ASCII client that runs in a Polish locale could access a z/OS EBCDICANY server and specify RENCODING=EBCDIC870 to access data that the client knows contains Polish-encoded data. Another ASCII client that runs in a German locale could access the same z/OS EBCDICANY server and specify RENCODING=EBCDIC1141 to access data that the client knows contains German data. Similarly, EBCDIC clients that access an ASCIIANY server can specify the precise ASCII encoding of the data that they are accessing by using the RENCODING= option in the LIBNAME statement.

See Also

Conceptual Information:

- “Overview to Transcoding” on page 27

TRANSCODE= Option

Specifies an attribute in the ATTRIB statement (which associates a format, informat, label, and length with one or more variables) that indicates whether character variables are to be transcoded.

Valid in: the ATTRIB statement in a DATA step

Category: Information

Type: Declarative

See: ATTRIB Statement under Windows UNIX z/OS in the documentation for your operating environment.

Syntax

ATTRIB *variable-list(s) attribute-list(s)* ;

Required Arguments

variable-list

names the variables that you want to associate with the attributes.

Tip: List the variables in any form that SAS allows.

attribute-list

specifies one or more attributes to assign to *variable-list*. Multiple attributes can be specified in the ATTRIB statement. For a complete list of attributes, see the "ATTRIB Statement" in *SAS Statements: Reference* .

TRANSCODE= YES | NO

Specifies whether to transcode character variables. Use TRANSCODE=NO to suppress transcoding. For more information, see "Overview to Transcoding" on page 27 .

Default: YES

Restriction: The TRANSCODE=NO attribute is not supported by some SAS Workspace Server clients. Variables with TRANSCODE=NO are not returned in SAS 9.3. Before SAS 9.3, variables with TRANSCODE=NO are transcoded. Prior releases of SAS cannot access a SAS 9.3 data set that contains a variable with a TRANSCODE=NO attribute.

Interactions:

You can use the VTRANSCODE and VTRANSCODEX functions to return whether transcoding is on or off for a character variable.

If the TRANSCODE= attribute is set to NO for any character variable in a data set, PROC CONTENTS prints a transcode column that contains the TRANSCODE= value for each variable in the data set. If all variables in the data set are set to the default TRANSCODE= value (YES), no transcode column is printed.

Examples

Example 1: Using the TRANSCODE= Option with the SET Statement

When you use the SET statement to create a data set from several data sets, SAS makes the TRANSCODE= attribute of the variable in the output data set equal to the

TRANSCODE= value of the variable in the first data set. In this example, the variable Z's TRANSCODE= attribute in data set A is NO because B is the first data set and Z's TRANSCODE= attribute in data set B is NO.

```
data b;
   length z $4;
   z = 'ice';
   attrib z transcode = NO;
data c;
   length z $4;
   z = 'snow';
   attrib z transcode = YES;
data a;
   set b;
   set c;
   /* Check transcode setting for variable Z */
   rc1 = vtranscode(z);
   put rc1=;
run;
```

Example 2: Using the TRANSCODE= Option with the MERGE Statement

When you use the MERGE statement to create a data set from several data sets, SAS makes the TRANSCODE= attribute of the variable in the output data set equal to the TRANSCODE= value of the variable in the first data set. In this example, the variable Z's TRANSCODE= attribute in data set A is YES because C is the first data set and Z's TRANSCODE= attribute in data set C is YES.

```
data b;
   length z $4;
   z = 'ice';
   attrib z transcode = NO;
data c;
   length z $4;
   z = 'snow';
   attrib z transcode = YES;
data a;
   merge c b;
   /* Check transcode setting for variable Z */
   rc1 = vtranscode(z);
   put rc1=;
run;
```

Note: The TRANSCODE= attribute is set when the variable is first seen on an input data set or in an ATTRIB TRANSCODE= statement. If a SET or MERGE statement comes before an ATTRIB TRANSCODE= statement and the TRANSCODE= attribute contradicts the SET statement, an error message will occur.

See Also

Functions:

- “VTRANSCODE Function” on page 321
- “VTRANSCODEX Function” on page 322

TRANTAB= Option

Specifies the translation table to use when you are transcoding character data in a SAS file for the appropriate output file.

Valid in: ODS MARKUP statement and ODS RTF statement

Category: ODS: Third-Party Formatted

Syntax

TRANTAB = (*translation-table*)

Optional Argument

translation-table
specifies the translation table to use for the output file. The translation table is an encoding method that maps characters (letters, logograms, digits, punctuation, symbols, control characters, and so on) in the character set to numeric values. An example of a translation table is one that converts characters from EBCDIC to ASCII-ISO. The *table-name* can be any translation table that SAS provides, or any user-defined translation table. The value must be the name of a SAS catalog entry in either the SASUSER.PROFILE catalog or the SASHELP.HOST catalog.

Details

Translation tables were introduced in SAS 6 to support the requirements of national languages. SAS 8.2 introduced the LOCALE= system option as an improvement on direct use of translation tables. SAS 9.1 supports the TRANTAB= option for backward compatibility. However, using the LOCALE= system option is preferred in later SAS releases.

Note: For SAS 9.3, using the TRANTAB = option in the ODS MARKUP is supported for backward compatibility. For specifying encoding, the LOCALE= system option is preferred.

See Also

Conceptual Information:

- “Transcoding and Translation Tables” on page 28
- “Locale for NLS” on page 5

System Options:

- “TRANTAB= System Option” on page 486
- “LOCALE System Option” on page 480

Procedures:

- Chapter 17, “TRANTAB Procedure,” on page 533

Statements:

- "ODS MARKUP Statement" in *SAS Output Delivery System: User's Guide*
- "ODS RTF Statement" in *SAS Output Delivery System: User's Guide*

XMLENCODING= Option

Overrides the encoding of an XML document to import or export an external document.

Valid in: LIBNAME statement for the XML engine

Category: Data Access

Syntax

XMLENCODING= '*encoding-value*'

Details

The LIBNAME statement for the XML engine, associates a SAS libref with an XML document to import or export an external document.

Comparisons

Options

encoding-value
specifies the encoding to use when you read, write, copy, or save an external file. The value for XMLENCODING= indicates that the external file has a different encoding from the current session encoding.

For details, see "SBCS, DBCS, and Unicode Encoding Values for Transcoding Data" on page 577.

The default for *encoding-value* is the current session encoding.

See Also

Statements:

- *SAS XML LIBNAME Engine: User's Guide*

TRANTAB Statement

Specifies the translation table to use when you transcode character data in order to export or transfer a SAS file.

Valid in: CPORT Procedure, UPLOAD procedure, DOWNLOAD procedure

Restriction: You can specify only one translation table per TRANTAB statement. To specify additional translation tables, use additional TRANTAB statements.

Interaction: The TRANTAB statement specifies a customized translation table (for example, to map an EBCDIC character to an ASCII character) to apply to the character set in the SAS file that is being exported or transferred. The TRANTAB= system option specifies a translation table to use for the SAS session, including file transfers.

Syntax

TRANTAB NAME=*translation-table-name* <TYPE=(*etype-list)*<OPT=DISP | SRC | (DISP SRC)>> ;

Required Argument

NAME=*translation-table-name*
specifies the name of the translation table to apply to the SAS catalog that you want to export (PROC CPORT) or transfer (PROC UPLOAD or PROC DOWNLOAD). The *translation-table-name* that you specify as the name of a catalog entry in either your SASUSER.PROFILE catalog or the SASHELP.HOST catalog. The SASUSER.PROFILE catalog is searched first, and then the SASHELP.HOST catalog is searched.

In most cases, the default translation table is the correct one to use, but you might need to apply additional translation tables if, for example, your application requires different national language characters.

You can specify a translation table other than the default in two ways:

- To specify a translation table for an invocation of the procedure, use the TRANTAB statement in the procedure, as appropriate.
- To specify a translation table for your entire SAS session or job (including all file exports or transfers), use the TRANTAB= system option.

Optional Arguments

TYPE=(*etype-list*)
applies the translation table only to the entries with the type or types that you specify. The *etype-list* can be one or more entry types. Examples of catalog entry types include DATA and FORMAT. If *etype-list* is a simple entry type, omit the parentheses.

By default, the UPLOAD, DOWNLOAD, and CPORT procedures apply the translation table to all specified catalog entries.

OPT=DISP | SRC | (DISP SRC)

OPT=DISP	applies the translation table only to the specified catalog entries, which produce window displays.
OPT=SRC	applies the translation table only to the specified catalog entries that are of the type SOURCE.
OPT=(DISP SRC)	applies the translation table only to the specified catalog entries that either produce window displays or are of type SOURCE.

If you do not specify the OPT= option, the UPLOAD or DOWNLOAD procedure applies the translation table to all of the entries in the catalog that you specify.

Default: PROC CPORT, PROC UPLOAD, and PROC DOWNLOAD apply the translation table to all entries and data sets in the specified catalog.

Details

Translation tables were introduced in SAS 6 to support the requirements of national languages. SAS 8.2 introduced the LOCALE= system option as an improvement on direct use of translation tables. SAS 9.3 supports the TRANTAB statement for backward compatibility. However, using the LOCALE= system option is preferred in later SAS

releases. For more information, see TS-639, Data Conversion Issues in V6–V8. This technical support note provides information for customers using non-English languages **http://support.sas.com/techsup/technote/ts639.pdf**

PROC CPORT is used when you transfer a SAS file across a network. PROC UPLOAD and PROC DOWNLOAD are used when you transfer a SAS file across a network.

You must specify the INCAT= and OUTCAT= options in the PROC UPLOAD or PROC DOWNLOAD statement when using the TRANTAB statement.

Examples

Example 1

The information that follows applies to procedure features:

- PROC CPORT statement option: FILE=
- TRANTAB statement option: TYPE=

This example shows how to apply a customized translation table to the transport file before PROC CPORT exports it. For this example, assume that you have already created a customized translation table called TTABLE1.

Example 2: Program

Assign library references. </userSuppliedValue>The LIBNAME and FILENAME statements assign a libref for the source library and a fileref for the transport file, respectively.

```
libname source
'\\sashq\root\pub\pubdoc\doc\901\authoring\proc\miscsrc\sasfiles\cport';
filename tranfile 'trans3';
proc trantab table=ascii;
save table=ttable1;
```

```
libname source 'SAS data-library';
filename tranfile 'transport-file'
                  host-option(s)-for-file-characteristics;
```

Apply the translation specifics.</userSuppliedValue> The TRANTAB statement applies the translation that you specify with the customized translation table TTABLE1. TYPE= limits the translation to FORMAT entries.

```
proc cport catalog=source.formats file=tranfile;
   trantab name=ttable1 type=(format);
run;
```

Example 3: SAS Log

```
NOTE: Proc CPORT begins to transport catalog SOURCE.FORMATS
NOTE: The catalog has 2 entries and its maximum logical record length is 104.
NOTE: Entry REVENUE.FORMAT has been transported.
NOTE: Entry DEPT.FORMATC has been transported.
```

See Also

Conceptual Information:

- "Transcoding for NLS" on page 27

System Options:

- "TRANTAB= System Option" on page 486

Procedures:

- Chapter 17, "TRANTAB Procedure," on page 533
- Chapter 14, "CPORT Procedure" in *Base SAS Procedures Guide*
- Chapter 23, "UPLOAD Procedure" in *SAS/CONNECT User's Guide*
- Chapter 24, "DOWNLOAD Procedure" in *SAS/CONNECT User's Guide*

Part 10

Procedures for NLS

Chapter 16

DBCSTAB Procedure

Overview: DBCSTAB Procedure

Purpose of the DBCSTAB Procedure

The DBCSTAB procedure produces conversion tables for the double-byte character sets that SAS supports.

Use the DBCSTAB procedure to modify an existing DBCS table when

- the DBCS encoding system that you are using is not supported by SAS
- the DBCS encoding system that you are using has a nonstandard translation table.

A situation where you would be likely to use the DBCSTAB procedure is when a valid DBCSTYPE= value is not available. These values are operating environment dependent. In such cases, you can use the DBCSTAB procedure to modify a similar translation table, and then you can specify the use of the new table with the TRANTAB option.

Syntax: DBCSTAB Procedure

PROC DBCSTAB TABLE=*table-name*
<BASETYPE=*base-type*> <CATALOG=<*libref.*>*catalog-name*>
<DATA=<*libref.*>*table-name*> <DBCSLANG=*language*>
<DESC='*description*'> <FORCE> <VERIFY> <VERBOSE>;

PROC DBCSTAB Statement

produces conversion tables for the double-byte character sets.

Syntax

PROC DBCSTAB TABLE=*table-name*
<*option(s)*>;

Required Argument

TABLE=
specifies the name of the double-byte code table to produce. This table name becomes an entry of type DBCSTAB in the catalog that is specified with the CATALOG= option. By default, the catalog name is SASUSER.DBCS.

Alias: NAME=, N=

Optional Arguments

BASETYPE=base-type
specifies a base type for the double-byte code table conversion. If you use this option, you reduce the number of tables that are produced.

If you specify BASETYPE=, then all double-byte codes are first converted to the base code, and then converted to the required code. If you have n codes, then there are n(n-1) conversions that must be made.

Alias: BTYPE=

***CATALOG=<libref.>*catalog-name**
specifies the name of the catalog in which the table is to be stored. If the catalog does not exist, it is created.

Default: SASUSER.DBCS

DATA=<libref.>table-name
specifies the data for producing the double-byte code table. Several double-byte character variables are required to produce the table. Use variable names that are equivalent to the value of the DBCSTYPE system option and are recognized by the KCVT function.

DBCSLANG=language
specifies the language that the double-byte code table uses. The value of this option should match the value of the DBCSLANG system option.

Alias: DBLANG

DESC='description'
specifies a text string to put in the DESCRIPTION field for the entry.

FORCE
produces the conversion tables even if errors are present.

VERIFY
checks the data range of the input table per code. This option is used to check for invalid double-byte code.

VERBOSE
causes the statistics detail to be printed when building DBCS tables.

Examples: DBCSTAB Procedure

Example 1: Creating a Conversion Table with the DBCSTAB Procedure

Features: PROC DBCSTAB statement options:
CATALOG=
DBLANG=
BASETYPE=
VERIFY

The following example creates a Japanese translation table called CUSTAB and demonstrates how the TRANTAB option can be used to specify this new translation table. The DBCS, DBCSLANG, and DBCSTYPE options are specified at start up.

```
/*these parameters are required for the code to work*/
sdsenv m900 –box dntdd
sdssas –dbcs –dbcslang japanese –dbcstype pcms
```

The TRANTAB data set is created as follows:

Program

```
data trantab;
      pcms='8342'x; dec='b9b3'x;
run;

proc dbcstab
      /* name of the new translate table */
          name=custtab
      /* based on pcibm encoding */
          basetype=pcms
      /* data to create the new table */
          data=trantab
      /* japanese language */
          dbcslang=japanese
      /* catalog descriptor */
          desc='Modified Japanese Trantab'
      /* where the table is stored */
          catalog=sasuser.dbcs
      /* checks for invalid DBCS in the new data */
          verify;
run;
```

To specify the translate table, use the TRANTAB option:

```
options trantab=(,,,,,,,,custtab);
```

Translate tables are generally used for DBCS conversion with SAS/CONNECT software, PROC CPORT and PROC CIMPORT, and the DATA step function, KCVT. The TRANTAB= option might be used to specify DBCS translate tables. For SAS release 8.2 and earlier versions, the ninth argument was formerly used to specify the DBCS system table. However, for SAS 9 and later versions, instead of using the ninth

argument, the SAS system uses a system table that is contained in a loadable module. Japanese, Korean, Chinese, and Taiwanese are acceptable for the systab name. The tenth argument specifies the DBCS user table:

```
options trantab=(,,,,,,,,systab); /* ninth argument */
```

Example 2: Producing Japanese Conversion Tables with the DBCSTAB Procedure

Features: PROC DBCSTAB statement options:
- TABLE=
- DATA=
- DBLANG=
- BASETYPE=
- VERIFY

Program

```
data ja_jpn;
   length ibm jis euc pcibm $2.;
   ibm='4040'x;
   jis='2121'x;
   euc='a1a1'x;
   pcibm='8140'x;
run;

proc dbcstab
   table=japanese
   data=ja_jpn
   dblang=japanese
   basetype=jis
   verify;
run;
```

SAS Log

```
1   proc dbcstab
2   table=ja_jpn
3   data=work.ja_jpn
4   dblang=japanese
5   basetype=jis
6   verify;
7   run;

NOTE: Base table for JIS created.
NOTE: IBM table for JIS created.
NOTE: PCIBM table for JIS created.
NOTE: EUC table for JIS created.
NOTE: Base table for IBM created.
NOTE: JIS table for IBM created.
NOTE: Base table for PCIBM created.
NOTE: JIS table for PCIBM created.
NOTE: Base table for EUC created.
NOTE: JIS table for EUC created.
NOTE: 10 DBCS tables are generated. Each table has 1 DBCS characters.
NOTE: Each table is 2 bytes in size.
NOTE: Required table memory size is 612.
NOTE: There were 1 observations read from the data set WORK.JA_JPN.
```

Chapter 17

TRANTAB Procedure

Overview: TRANTAB Procedure

The TRANTAB procedure creates, edits, and displays customized translation tables. In addition, you can use PROC TRANTAB to view and modify translation tables that are supplied by SAS. These SAS supplied tables are stored in the SASHELP.HOST catalog. Any translation table that you create or customize is stored in your SASUSER.PROFILE catalog. Translation tables have an entry type of TRANTAB.

Translation tables are operating environment-specific SAS catalog entries that are used to translate the values of one (coded) character set to another. A translation table has two halves: table one provides a translation, such as ASCII to EBCDIC; table two provides the inverse (or reverse) translation, such as EBCDIC to ASCII. Each half of a translation table is an array of 256 two-digit *positions*, each of which contains a one-byte unsigned number that corresponds to a coded character.

The SAS System uses translation tables for the following purposes:

- determining the collating sequence in the SORT procedure
- performing transport-format translations when you transfer files with the CPORT and CIMPORT procedures
- performing translations between operating environments when you access remote data in SAS/CONNECT or SAS/SHARE software
- facilitating data communications between the operating environment and a graphics device when you run SAS/GRAPH software in an IBM environment
- accommodating national language character sets other than U.S. English.

PROC TRANTAB produces no output. It can display translation tables and notes in the SAS log.

Note: Translation tables were introduced in SAS 6 to support the requirements of national languages. SAS 8.2 introduced the LOCALE= system option as an improvement on direct use of translation tables. SAS 9.2 supports the TRANTAB procedure for backward compatibility. However, using the LOCALE= system option is preferred in later SAS releases.PROC TRANTAB is an interactive procedure. Once you submit a PROC TRANTAB statement, you can continue to enter and execute statements without repeating the PROC TRANTAB statement. To terminate the procedure, submit a QUIT statement or submit another DATA or PROC statement.

Concepts: TRANTAB Procedure

Understanding Translation Tables and Character Sets for PROC TRANTAB

The kth element in a translation table corresponds to the kth element of an ordered character set. For example, position 00 (which is byte 1) in a translation table contains a coded value that corresponds to the first element of the ordered character set. To determine the position of a character in your operating environment's character set, use the SAS function RANK. The following example shows how to use RANK:

```
data _null_;
x=rank('a');
put "The position of a is " x ".";
run;
```

The SAS log prints the following message: **`The position of a is 97 .`**

Each position in a translation table contains a hexadecimal number that is within the range of 0 ('00'x) to 255 ('FF'x). Hexadecimal values always end with an x. You can represent one or more consecutive hexadecimal values within quotation marks followed by a single x. For example, a string of three consecutive hexadecimal values can be written as '08090A'x. The SAS log displays each row of a translation table as 16 hexadecimal values enclosed in quotes followed by an x. The SAS log also lists reference numbers in the vertical and horizontal margins that correspond to the positions in the table. "Example 1: Viewing a Translation Table" on page 543 shows how the SAS log displays a translation table.

Storing Translation Tables with PROC TRANTAB

When you use PROC TRANTAB to create a customized translation table, the procedure automatically stores the table in your SASUSER.PROFILE catalog. This enables you to use customized translation tables without affecting other users. When you specify the translation table in the SORT procedure or in a GOPTIONS statement, the software first looks in your SASUSER.PROFILE catalog to find the table. If the specified translation table is not in your SASUSER.PROFILE catalog, the software looks in the SASHELP.HOST catalog.

If you want the translation table that you create to be globally accessed, have your SAS Installation Representative copy the table from your SASUSER.PROFILE catalog (using the CATALOG procedure) to the SASHELP.HOST catalog. If the table is not found there, the software will continue to search in SASHELP.LOCALE for the table.

Modifying SAS Translation Tables with PROC TRANTAB

If a translation table that is provided by SAS does not meet your needs, you can use PROC TRANTAB to edit it and create a new table. That is, you can issue the PROC TRANTAB statement that specifies the SAS table, edit the table, and then save the table using the SAVE statement. The modified translation table is saved in your SASUSER.PROFILE catalog. If you are a SAS Installation Representative, you can modify a translation table with PROC TRANTAB and then use the CATALOG procedure to copy the modified table from your SASUSER.PROFILE catalog to the SASHELP.HOST catalog, as shown in the following example:

```
proc catalog c=sasuser.profile;
   copy out=sashelp.host entrytype=trantab;
run;
```

You can use PROC TRANTAB to modify translation tables stored in the SASHELP.HOST catalog only if you have update (or write) access to that data library and catalog.

Using Translation Tables Outside PROC TRANTAB

Using Translation Tables in the SORT Procedure

PROC SORT uses translation tables to determine the collating sequence to be used by the sort. You can specify an alternative translation table with the SORTSEQ= option of PROC SORT. For example, if your operating environment sorts with the EBCDIC sequence by default, and you want to sort with the ASCII sequence, you can issue the following statement to specify the ASCII translation table:

```
proc sort sortseq=ascii;
run;
```

You can also create a customized translation table with PROC TRANTAB and specify the new table with PROC SORT. This table is useful when you want to specify sorting sequences for languages other than U.S. English.

See “Example 6: Using Different Translation Tables for Sorting” on page 552 for an example that uses translation tables to sort data in different ways. For information about the tables available for sorting and the SORTSEQ= option, see “SORTSEQ= System Option: UNIX, Windows, and z/OS” on page 485 .

Using Translation Tables with the CPORT and CIMPORT Procedures

The CPORT and CIMPORT procedures use translation tables to translate characters in catalog entries that you export from one operating environment and import on another operating environment. You might specify the name of a supplied translation table or a customized translation table in the TRANTAB statement of PROC CPORT. See "TRANTAB Statement" on page 520 in the CPORT Procedure for more information.

Using Translation Tables with Remote Library Services

Remote Library Services (RLS) uses translation tables to translate characters when you access SAS 8 remote data. SAS/CONNECT and SAS/SHARE software use translation tables to translate characters when you transfer or share files between two operating environments that use different encoding standards.

Note: For more information, see TS-706: How to use the %lswbatch macro **`http://support.sas.com/techsup/technote/ts706.pdf`**.

Using Translation Tables in SAS/GRAPH Software

In SAS/GRAPH software, translation tables are most commonly used on an IBM operating environment where tables are necessary because graphics commands must leave IBM operating environments in EBCDIC representation but must reach asynchronous graphics devices in ASCII representation. Specifically, SAS/GRAPH software builds the command stream for these devices internally in ASCII representation but must convert the commands to EBCDIC representation before they can be given to the communications software for transmission to the device. SAS/GRAPH software uses a translation table internally to make the initial conversion from ASCII to EBCDIC. The communications software then translates the command stream back to ASCII representation before it reaches the graphics device.

Translation tables are operating environment-specific. In most cases, you can simply use the default translation table, SASGTAB0, or one of the SAS supplied graphics translation tables. However, if these tables are not able to do all of the translation correctly, you can create your own translation table with PROC TRANTAB. The SASGTAB0 table might fail to do the translation correctly when it encounters characters from languages other than U.S. English.

To specify an alternative translation table for SAS/GRAPH software, you can either use the TRANTAB= option in a GOPTIONS statement or modify the TRANTAB device parameter in the device entry. For example, the following GOPTIONS statement specifies the GTABTCAM graphics translation table:

```
goptions trantab=gtabtcam;
```

Translation tables used in SAS/GRAPH software perform both device-to-operating environment translation and operating environment-to-device translation. Therefore, a translation table consists of 512 bytes, with the first 256 bytes used to perform device-to-operating environment translation (ASCII to EBCDIC on IBM mainframes) and the second 256 bytes used to perform operating environment-to-device translation (EBCDIC to ASCII on IBM mainframes). For PROC TRANTAB, the area of a translation table for device-to-operating environment translation is considered to be table one, and the area for operating environment-to-device translation is considered to be table two. See "Example 1: Viewing a Translation Table" on page 543 for a listing of the ASCII translation table (a SAS provided translation table), which shows both areas of the table.

On operating environments other than IBM mainframes, translation tables can be used to translate specific characters in the data stream that are created by the driver. For example, if the driver normally generates a vertical bar in the data stream, but you want another character to be generated in place of the vertical bar, you can create a translation table that translates the vertical bar to an alternate character.

For details about how to specify translation tables with the TRANTAB= option in SAS/GRAPH software, see SAS/GRAPH Software: Reference, Version 6, First Edition, Volume 1 and Volume 2.

SAS/GRAPH software also uses key maps and device maps to map codes generated by the keyboard to specified characters and to map character codes to codes required by the graphics output device. These maps are specific to SAS/GRAPH software. For more information, contact SAS Institute's Technical Support Division.

Syntax: TRANTAB Procedure

Tip: Supports RUN-group processing

PROC TRANTAB TABLE=*table-name* <NLS>;
CLEAR <ONE|TWO|BOTH>;
INVERSE;
LIST <ONE|TWO|BOTH>;
LOAD TABLE=*table-name* <NLS>;
REPLACE *position value-1*<*…value-n*>;
SAVE <TABLE=*table-name*> <ONE|TWO|BOTH>;
SWAP;

Translation tables were introduced in SAS 6 to support the requirements of national languages. SAS 8.2 introduced the LOCALE= system option as an improvement on direct use of translation tables. SAS 9.3 supports the TRANTAB procedure for backward compatibility. However, using the LOCALE= system option is preferred in later SAS releases. PROC TRANTAB is an interactive procedure. Once you submit a PROC TRANTAB statement, you can continue to enter and execute statements without repeating the PROC TRANTAB statement. To terminate the procedure, submit a QUIT statement or submit another DATA or PROC statement.

Statement	Task
CLEAR Statement	Set all positions in the translation table to zero
INVERSE Statement	Create an inverse of table 1
LIST Statement	Display a translation table in hexadecimal representation
LOAD Statement	Load a translation table into memory for editing
REPLACE Statement	Replace the characters in a translation table with specified values
SAVE Statement	Save the translation table in your SASUSER.PROFILE catalog
SWAP Statement	Exchange table 1 with table 2

PROC TRANTAB Statement

Creates, edits or displays a translations table.

Tip: If there is an incorrect table name in the PROC TRANTAB statement, use the LOAD statement to load the correct table. You do not need to reinvoke PROC TRANTAB. New tables are not stored in the catalog until you issue the SAVE statement, so you will not have unwanted tables in your catalog.

Syntax

PROC TRANTAB TABLE=*table-name* <NLS>;

Required Argument

TABLE=table-name
specifies the translation table to create, edit, or display. The specified table name must be a valid one-level SAS name with no more than eight characters.

Optional Argument

NLS
specifies that the table that you listed in the TABLE= argument is one of five special internal translation tables provided with every copy of the SAS System. You must use the NLS option when you specify one of the five special tables in the TABLE= argument. NLS stands for National Language Support. This option and the associated translation tables provide a method to translate characters that exist in languages other than English. To make SAS use the modified NLS table, specify its name in the SAS system option TRANTAB= . When you load one of these special translation tables, the SAS log displays a note that states that table 2 is uninitialized. That is, table 2 is an empty table that contains all zeros. PROC TRANTAB does not use table 2 at all for translation in these special cases, so you do not need to be concerned about this note.

SASXPT
the local-to-transport format translation table (used by the CPORT procedure)

SASLCL
the transport-to-local format translation table (used by the CIMPORT procedure)

SASUCS
the lowercase-to-uppercase translation table (used by the UPCASE function)

SASLCS
the uppercase-to-lowercase translation table (used by the LOWCASE macro)

SASCCL
the character classification table (used internally), which contains flag bytes that correspond to each character position that indicate the class or classes to which each character belongs.

CLEAR Statement

Sets all positions in the translation table to zero; used when you create a new table.

Syntax

CLEAR <ONE|TWO|BOTH>;

Optional Argument

ONE | TWO | BOTH

ONE
clears table 1.

TWO
clears table 2.

BOTH
clears both table 1 and table 2.

Default: ONE

INVERSE Statement

Creates an inverse of table 1 in a translation table. INVERSE creates table 2.

Syntax

INVERSE;

Details

INVERSE does not preserve multiple translations. Suppose table 1 has two (or more) different characters translated to the same value; for example, "A" and "B" are both translated to "1". For table 2, INVERSE uses the last translated character for the value. "1" is always translated to "B" and not "A", assuming that "A" appears before "B" in the first table. Sort programs in SAS require an inverse table for proper operation.

LIST Statement

Displays in the SAS log a translation table in hexadecimal representation.

Syntax

LIST <ONE|TWO|BOTH>;

Optional Argument

ONE | TWO | BOTH

ONE
displays table 1.

TWO
displays table 2.

BOTH
displays both table 1 and table 2.

Default: ONE

LOAD Statement

Loads a translation table into memory for editing.

Tips: Use LOAD when you specify an incorrect table name in the PROC TRANTAB statement. You can specify the correct name without reinvoking the procedure.

Use LOAD to edit multiple translation tables in a single PROC TRANTAB step. (Be sure to save the first table before you load another one.)

Syntax

LOAD TABLE=*table-name* <NLS>;

Required Argument

TABLE=table-name
specifies the name of an existing translation table to be edited. The specified table name must be a valid one-level SAS name.

Optional Argument

NLS
specifies that the table that you listed in the TABLE= argument is one of five special internal translation tables that are provided with SAS. You must use the NLS option when you specify one of the five special tables in the TABLE= argument:

SASXPT
is the local-to-transport format translation table

SASLCL
is the transport-to-local format translation table

SASUCS
is the lowercase-to-uppercase translation table

SASLCS
is the uppercase-to-lowercase translation table

SASCCL
is the character classification table, which contains flag bytes that correspond to each character position, these positions indicate the class or classes to which each character belongs.

NLS stands for National Language Support. This option and the associated translation tables provide a method to map characters from languages other than English to programs, displays, and files. When you load one of these special translation tables, the SAS log displays a note that states that table 2 is uninitialized. That is, table 2 is an empty table that contains all zeros. PROC TRANTAB does not use table 2 for translation in these special cases.

REPLACE Statement

Replaces characters in a translation table with the specified values, starting at the specified position.

Alias: REP

Tip: To save edits, you must issue the SAVE statement.

Syntax

REPLACE *position value-1*<*…value-n*>;

Required Arguments

position
specifies the position in a translation table where the replacement is to begin. The editable positions in a translation table begin at position decimal 0 and end at decimal 255. To specify the position, you can do either of the following:

- Use a decimal or hexadecimal value to specify an actual location. If you specify a decimal value, for example, 20, PROC TRANTAB locates position 20 in the table, which is byte 21. If you specify a hexadecimal value, for example, '14'x, PROC TRANTAB locates the decimal position that is equivalent to the specified hexadecimal value, which in this case is position 20 (or byte 21) in the table.
- Use a quoted character. PROC TRANTAB locates the quoted character in the table (that is, the quoted character's hexadecimal value) and uses that character's position as the starting position. For example, if you specify the following REPLACE statement, the statement replaces the first occurrence of the hexadecimal value for "a" and the next two hexadecimal values with the hexadecimal equivalent of "ABC": `replace 'a' 'ABC';`

  This action is useful when you want to locate alphabetic and numerical characters but you do not know their actual location. If the quoted character is not found, PROC TRANTAB displays an error message and ignores the statement.

  To edit positions 256 through 511 (table two), follow this procedure:

1. Issue the SWAP statement.
2. Issue the appropriate REPLACE statement.
3. Issue the SWAP statement again to reposition the table.

value-1 <…value-n>
is one or more decimal, hexadecimal, or character constants that give the actual value to be put into the table, starting at position. You can also use a mixture of the types of values. That is, you can specify a decimal, a hexadecimal, and a character value in

one REPLACE statement. "Example 3: Editing by Specifying a Decimal Value for Starting Position" on page 547 shows a mixture of all three types of values in the REPLACE statement.

SAVE Statement

Saves the translation table in your SASUSER.PROFILE catalog.

Syntax

SAVE <TABLE=*table-name*> <ONE|TWO|BOTH>;

Optional Arguments

TABLE=table-name
specifies the name under which the current table is to be saved. The name must be a valid one-level SAS name.

Default: If you omit the TABLE= option, the current table is saved under the name you specify in the PROC TRANTAB statement or the LOAD statement.

ONE | TWO | BOTH

ONE
saves table one.

TWO
saves table two.

BOTH
saves both table one and table two.

Default: BOTH

SWAP Statement

Exchanges table 1 with table 2 to enable you to edit positions 256 through 511.

Tip: After you edit the table, you must the issue SWAP statement again to reposition the table.

Syntax

SWAP;

Examples: TRANTAB Procedure

Example 1: Viewing a Translation Table

Features: LIST statement

This example uses PROC TRANTAB to display the ASCII translation table supplied by SAS. All examples were produced in the UNIX environment.

Set the options and specify a translation table.

```
options nodate pageno=1 linesize=80 pagesize=60;
proc trantab table=ascii;
```

Display both halves of the translation table. The LIST BOTH statement displays both the table that provides the translation and the table that provides the inverse translation.

```
list both;
```

SAS Log

```
NOTE: Table specified is ASCII.
ASCII table 1:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '606162636465666768696A6B6C6D6E6F'x
     70 '707172737475767778797A7B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x


ASCII table 2:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '606162636465666768696A6B6C6D6E6F'x
     70 '707172737475767778797A7B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

Example 2: Creating a Translation Table

Features: Procedures features:
- LIST statement
- REPLACE statement
- SAVE statement

This example uses PROC TRANTAB to create a customized translation table. All examples were produced in the UNIX environment.

Set the system options and specify the translation table to edit.

```
options nodate pageno=1 linesize=80
pagesize=60;
proc trantab table=newtable;
```

Replace characters in the translation table starting at a specified position. The REPLACE statement places the values in the table starting at position 0. You can use hexadecimal strings of any length in the REPLACE statement. This example uses strings of length 16 to match the way that translation tables appear in the SAS log.

```
replace 0
'00010203a309e57ff9ecc40b0c0d0e0f'x
'10111213a5e008e71819c6c51c1d1e1f'x
'c7fce9e2e40a171beaebe8efee050607'x
'c9e616f4f6f2fb04ffd6dca2b6a7501a'x
'20e1edf3faf1d1aababfa22e3c282b7c'x
'265facbdbca1abbb5f5f21242a293bac'x
'2d2f5fa6a6a6a62b2ba6a62c255f3e3f'x
'a62b2b2b2b2b2b2d2d603a2340273d22'x
'2b6162636465666768692d2ba6a62b2b'x
'2d6a6b6c6d6e6f7071722da62d2b2d2d'x
'2d7e737475767778787a2d2b2b2b2b2b'x
'2b2b2b5f5fa65f5f5fdf5fb65f5fb55f'x
'7b41424344454647484 95f5f5f5f5f5f'x
'7d4a4b4c4d4e4f5051525f5f5fb15f5f'x
'5c83535455565758595a5f5ff75f5fb0'x
'3031323334353637383 9b75f6eb25f5f'x
;
```

Save the table. The SAVE statement saves the table under the name that is specified in the PROC TRANTAB statement. By default, the table is saved in your SASUSER.PROFILE catalog.

```
save;
```

Display both halves of the translation table in the SAS log. The LIST BOTH statement displays both the table that provides the translation and the table that provides the inverse translation.

```
list both;
```

SAS Log

```
 -->Create
and edit table 2. Table 2 is
empty; that is, it
consists entirely of 0s. To create table 2, you can use the INVERSE statement.
(See


.) To edit table 2, you can use the SWAP statement with the REPLACE statement.
(See

.)" commented-out by old2new conversion -->

 NOTE: Table specified is NEWTABLE.
WARNING: Table NEWTABLE not found! New table is assumed.
NOTE: NEWTABLE table 1 is uninitialized.
NOTE: NEWTABLE table 2 is uninitialized.

NOTE: Saving table NEWTABLE.
NOTE: NEWTABLE table 2 will not be saved because it is uninitialized.
NEWTABLE table 1:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '00010203A309E57FF9ECC40B0C0D0E0F'x
     10 '10111213A5E008E71819C6C51C1D1E1F'x
     20 'C7FCE9E2E40A171BEAEBE8EFEE050607'x
     30 'C9E616F4F6F2FB04FFD6DCA2B6A7501A'x
     40 '20E1EDF3FAF1D1AABABFA22E3C282B7C'x
     50 '265FACBDBCA1ABBB5F5F21242A293BAC'x
     60 '2D2F5FA6A6A6A62B2BA6A62C255F3E3F'x
     70 'A62B2B2B2B2B2B2D2D603A2340273D22'x
     80 '2B6162636465666768692D2BA6A62B2B'x
     90 '2D6A6B6C6D6E6F7071722DA62D2B2D2D'x
     A0 '2D7E737475767778787A2D2B2B2B2B2B'x
     B0 '2B2B2B5F5FA65F5F5FDF5FB65F5FB55F'x
     C0 '7B41424344454647484955F5F5F5F5F5F'x
     D0 '7D4A4B4C4D4E4F5051525F5F5FB15F5F'x
     E0 '5C83535455565758595A5F5FF75F5FB0'x
     F0 '30313233343536373839B75F6EB25F5F'x



NOTE: NEWTABLE table 2 is uninitialized.
NEWTABLE table 2:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '00000000000000000000000000000000'x
     10 '00000000000000000000000000000000'x
     20 '00000000000000000000000000000000'x
     30 '00000000000000000000000000000000'x
     40 '00000000000000000000000000000000'x
     50 '00000000000000000000000000000000'x
     60 '00000000000000000000000000000000'x
     70 '00000000000000000000000000000000'x
     80 '00000000000000000000000000000000'x
     90 '00000000000000000000000000000000'x
     A0 '00000000000000000000000000000000'x
     B0 '00000000000000000000000000000000'x
     C0 '00000000000000000000000000000000'x
     D0 '00000000000000000000000000000000'x
     E0 '00000000000000000000000000000000'x
     F0 '00000000000000000000000000000000'x
```

Example 3: Editing by Specifying a Decimal Value for Starting Position

Features: LIST statement
REPLACE statement
SAVE statement

This example edits the translation table that was created in "Example 2: Creating a Translation Table" on page 544 . The decimal value specified in the REPLACE statement marks the starting position for the changes to the table.

The vertical arrow in both SAS logs marks the point at which the changes begin.

All examples were produced in the UNIX environment.

Program 1: Display the Original Table

```
options nodate pageno=1 linesize=80 pagesize=60; proc trantab table=newtable;
list one;
```

Program Description

Set the system options and specify the translation table to edit.

```
options nodate pageno=1 linesize=80 pagesize=60; proc trantab table=newtable;
```

Display the original table. This LIST statement displays the original NEWTABLE translation table.

```
list one;
```

SAS Log

The Original NEWTABLE Translation Table

```
Table specified is NEWTABLE.
NOTE: NEWTABLE table 2 is uninitialized.
NEWTABLE table 1:
                              ↓
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '00010203A309E57FF9ECC40B0C0D0E0F'x
     10 '10111213A5E008E71819C6C51C1D1E1F'x
     20 'C7FCE9E2E40A171BEAEBE8EFEE050607'x
     30 'C9E616F4F6F2FB04FFD6DCA2B6A7501A'x
     40 '20E1EDF3FAF1D1AABABFA22E3C282B7C'x
     50 '265FACBDBCA1ABBB5F5F21242A293BAC'x
     60 '2D2F5FA6A6A6A62B2BA6A62C255F3E3F'x
     70 'A62B2B2B2B2B2B2D2D603A2340273D22'x
     80 '2B6162636465666768692D2BA6A62B2B'x
     90 '2D6A6B6C6D6E6F7071722DA62D2B2D2D'x
     A0 '2D7E737475767778787A2D2B2B2B2B2B'x
     B0 '2B2B2B5F5FA65F5F5FDF5FB65F5FB55F'x
     C0 '7B41424344454647484955F5F5F5F5F5F'x
     D0 '7D4A4B4C4D4E4F5051525F5F5FB15F5F'x
     E0 '5C83535455565758595A5F5FF75F5FB0'x
     F0 '30313233343536373839B75F6EB25F5F'x
```

Program 2: Edit the Table

```
replace 10
   20 10 200 'x' 'ux' '092040'x;
save;

 list one;
```

Program Description

Replace characters in the translation table, starting at a specified position. The REPLACE statement starts at position decimal 10, which is byte 11 in the original table, and performs a byte-to-byte replacement with the given values.

```
replace 10
   20 10 200 'x' 'ux' '092040'x;
```

Save the changes. The SAVE statement saves the changes that you made to the NEWTABLE translation table.

```
save;
```

Display the new table. The second LIST statement displays the edited NEWTABLE translation table.

```
 list one;
```

SAS Log

```
Saving table NEWTABLE.
NOTE: NEWTABLE table 2 will not be saved because it is uninitialized.
NEWTABLE table 1:
                              ↓
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '00010203A309E57FF9EC140AC8787578'x
     10 '09204013A5E008E71819C6C51C1D1E1F'x
     20 'C7FCE9E2E40A171BEAEBE8EFEE050607'x
     30 'C9E616F4F6F2FB04FFD6DCA2B6A7501A'x
     40 '20E1EDF3FAF1D1AABABFA22E3C282B7C'x
     50 '265FACBDBCA1ABBB5F5F21242A293BAC'x
     60 '2D2F5FA6A6A6A62B2BA6A62C255F3E3F'x
     70 'A62B2B2B2B2B2B2D2D603A2340273D22'x
     80 '2B6162636465666768692D2BA6A62B2B'x
     90 '2D6A6B6C6D6E6F7071722DA62D2B2D2D'x
     A0 '2D7E737475767778787A2D2B2B2B2B2B'x
     B0 '2B2B2B5F5FA65F5F5FDF5FB65F5FB55F'x
     C0 '7B41424344454647484 95F5F5F5F5F5F'x
     D0 '7D4A4B4C4D4E4F5051525F5F5FB15F5F'x
     E0 '5C83535455565758595A5F5FF75F5FB0'x
     F0 '303132333435363738 39B75F6EB25F5F'x
```

Output Details

At position 10 (which is byte 11), a vertical arrow denotes the starting point for the changes to the translation table.

At byte 11, decimal 20 (which is hexadecimal 14) replaces hexadecimal C4.

At byte 12, decimal 10 (which is hexadecimal 0A) replaces hexadecimal 0B.

At byte 13, decimal 200 (which is hexadecimal C8) replaces hexadecimal 0C.

At byte 14, character 'x' (which is hexadecimal 78) replaces hexadecimal 0D.

At bytes 15 and 16, characters 'ux' (which are hexadecimal 75 and 78, respectively) replace hexadecimal 0E and 0F.

At bytes 17, 18, and 19, hexadecimal 092040 replaces hexadecimal 101112.

Example 4: Editing by Using a Quoted Character for Starting Position

Features: LIST statement
LOAD statement
REPLACE statement
SAVE statement

This example creates a new translation table by editing the already fixed ASCII translation table. The first occurrence of the hexadecimal equivalent of the quoted character that was specified in the REPLACE statement is the starting position for the changes to the table. This method differs from "Example 3: Editing by Specifying a Decimal Value for Starting Position" on page 547 in that you do not need to know the exact position at which to start the changes to the table. PROC TRANTAB finds the correct position for you.

The edited table is saved under a new name. Horizontal arrows in both SAS logs denote the edited rows in the translation table.

All examples were produced in the UNIX environment.

Program 1: Display the Original Table

```
options nodate pageno=1 linesize=80 pagesize=60;
proc trantab table=ascii;

list one;
```

Program Description

Set the system options and specify which translation table to edit.

```
options nodate pageno=1 linesize=80 pagesize=60;
proc trantab table=ascii;
```

Display the translation table. The LIST statement displays the original translation table in the SAS log.

```
list one;
```

SAS Log

```
NOTE: Table specified is ASCII.
ASCII table 1:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '606162636465666768696A6B6C6D6E6F'x   ←
     70 '707172737475767778797A7B7C7D7E7F'x   ←
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

Program 2: Edit the Table

```
replace 'a' 'ABCDEFGHIJKLMNOPQRSTUVWXYZ';
save table=upper;
load table=upper;
   list one;
```

Program Description

Replace characters in the translation table, starting at a specified position. The REPLACE statement finds the first occurrence of the hexadecimal "a" (which is 61) and replaces it, and the next 25 hexadecimal values, with the hexadecimal values for uppercase "A" through "Z."

```
replace 'a' 'ABCDEFGHIJKLMNOPQRSTUVWXYZ';
```

Save your changes. The SAVE statement saves the changes made to the ASCII translation table under the new table name UPPER. The stored contents of the ASCII translation table remain unchanged.

```
save table=upper;
```

Load and display the translation table. The LOAD statement loads the edited translation table UPPER. The LIST statement displays the translation table UPPER in the SAS log.

```
load table=upper;
   list one;
```

SAS Log

```
NOTE: Table UPPER
being loaded.
UPPER table 1:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '604142434445464748494A4B4C4D4E4F'x   ←
     70 '505152535455565758595A7B7C7D7E7F'x   ←
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

Example 5: Creating the Inverse of a Table

Features: INVERSE statement
LIST statement
SAVE statement

This example creates the inverse of the translation table that was created in "Example 4: Editing by Using a Quoted Character for Starting Position" on page 549 . The new translation table that is created in this example is the operating environment-to-device translation for use in data communications.

```
options nodate pageno=1 linesize=80 pagesize=60;
proc trantab table=upper;
```

Create the inverse translation table, save the tables, and display the tables. The INVERSE statement creates table 2 by inverting the original table 1 (called UPPER). The SAVE statement saves the translation tables. The LIST BOTH statement displays both the original translation table and its inverse.

```
inverse;
   save;
   list both;
```

SAS Log

The INVERSE statement lists in the SAS log all of the multiple translations that it encounters as it inverts the translation table. In "Example 4: Editing by Using a Quoted Character for Starting Position" on page 549 , all the lowercase letters were converted to uppercase in the translation table UPPER, which means that there are two sets of uppercase letters in UPPER. When INVERSE cannot make a translation, PROC TRANTAB fills the value with 00. Note that the inverse of the translation table UPPER has numerous 00 values.

The SAS log lists all the duplicate values that it encounters as it creates the inverse of table one. To conserve space, most of these messages are deleted in this example.

```
NOTE: This table cannot be mapped one to one.
 duplicate of '41'x found at '61'x in table one.
 duplicate of '42'x found at '62'x in table one.
 duplicate of '43'x found at '63'x in table one.
   .
   .
   .
 duplicate of '58'x found at '78'x in table one.
 duplicate of '59'x found at '79'x in table one.
 duplicate of '5A'x found at '7A'x in table one.
NOTE: Saving table UPPER.
UPPER table 1:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '604142434445464748494A4B4C4D4E4F'x
     70 '505152535455565758595A7B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x


UPPER table 2:
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '600000000000000000000000000000000'x
     70 '000000000000000000000007B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

Example 6: Using Different Translation Tables for Sorting

Features: PROC SORT statement option: SORTSEQ=
PRINT procedure

This example shows how to specify a different translation table to sort data in an order that is different from the default sort order. Characters that are written in a language other than U.S. English might require a sort order that is different from the default order.

You can use the TRABASE program in the SAS Sample Library to create translation tables for several languages. All examples were produced in the UNIX environment.

Set the SAS system options.

```
options nodate pageno=1 linesize=80 pagesize=60;
```

Create the TESTSORT data set. The DATA step creates a SAS data set with four pairs of words, each pair different only in the case of the first letter.

```
data testsort;
   input Values $10.;
   datalines;
Always
always
Forever
forever
Later
later
Yesterday
yesterday
;
```

Sort the data in an order that is different from the default sort order. PROC SORT sorts the data by using the default translation table, which sorts all lowercase words first, then all uppercase words.

```
proc sort;
   by values;
run;
```

Print the data set. PROC PRINT prints the sorted data set.

```
proc print noobs;
   title 'Default Sort Sequence';
run;
```

SAS Output

The following output is the output from sorting values with default translation table. The default sort sequence sorts all the capitalized words in alphabetical order before it sorts any lowercase words.

```
Default Sort Sequence
1

                                  Values

                                  Always
                                  Forever
                                  Later
                                  Yesterday
                                  always
                                  forever
                                  later
                                  yesterday
```

Sort the data according to the translation table UPPER and print the new data set. The SORTSEQ= option specifies that PROC SORT sort the data according to the customized translation table UPPER, which treats lowercase and uppercase letters alike. This method is useful for sorting without regard for case. PROC PRINT prints the sorted data set.

```
proc sort sortseq=upper;
   by values;
run;
proc print noobs;
   title 'Customized Sort Sequence';
run;
```

SAS Output

The following output is the result from sorting values with a customized translation table. The customized sort sequence sorts all the words in alphabetical order, without regard for the case of the first letters.

```
                          Customized Sort Sequence                          2

                                 Values

                                 Always
                                 always
                                 Forever
                                 forever
                                 Later
                                 later
                                 Yesterday
                                 yesterday
```

Example 7: Editing Table 1 and Table 2

Features: LIST statement

REPLACE statement
SAVE statement
SWAP statement

This example shows how to edit both areas of a translation table. To edit positions 256 through 511 (table 2), you must

- Issue the SWAP statement to have table 2 change places with table 1.
- Issue an appropriate REPLACE statement to make changes to table two.
- Issue the SWAP statement again to reposition the table.

Arrows in the SAS logs mark the rows and columns that are changed.

Set the SAS system options and specify the translation table.

```
options nodate pageno=1 linesize=80 pagesize=60;
proc trantab table=upper;
```

Display the original translation table. The LIST statement displays the original UPPER translation table.

```
list both;
```

SAS Log

The following output is the original UPPER translation table.

```
NOTE: Table specified is UPPER.
UPPER table 1:
           ↓
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x   ←
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '604142434445464748494A4B4C4D4E4F'x
     70 '505152535455565758595A7B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x

UPPER table 2:
           ↓
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000102030405060708090A0B0C0D0E0F'x   ←
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '600000000000000000000000000000000'x
     70 '000000000000000000000007B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

Replace characters in the translation table starting at a specified position. The REPLACE statement starts at position 1 and replaces the current value of 01 with '0A'.

```
replace 1 '0A'x;
```

Prepare table 2 to be edited. The first SWAP statement positions table 2 so that it can be edited. The second REPLACE statement makes the same change in table 2 that was made in table 1.

```
swap;
   replace 1 '0A'x;
```

Save and display the tables in their original positions. The second SWAP statement restores tables 1 and table 2 to their original positions. The SAVE

statement saves both areas of the translation table by default. The LIST statement displays both areas of the table.

```
swap;
   save;
   list both;
```

SAS Log

The Edited UPPER Translation Table In byte 2, in both areas of the translation table, hexadecimal value '0A' replaces hexadecimal value 01. Arrows mark the rows and columns of the table in which this change is made.

```
NOTE: Table specified is UPPER.
UPPER table 1:
           [darr]
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000A02030405060708090A0B0C0D0E0F'x   <--
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '604142434445464748494A4B4C4D4E4F'x
     70 '505152535455565758595A7B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x

UPPER table 2:
           [darr]
          0 1 2 3 4 5 6 7 8 9 A B C D E F
     00 '000A02030405060708090A0B0C0D0E0F'x   <--
     10 '101112131415161718191A1B1C1D1E1F'x
     20 '202122232425262728292A2B2C2D2E2F'x
     30 '303132333435363738393A3B3C3D3E3F'x
     40 '404142434445464748494A4B4C4D4E4F'x
     50 '505152535455565758595A5B5C5D5E5F'x
     60 '600000000000000000000000000000000'x
     70 '000000000000000000000007B7C7D7E7F'x
     80 '808182838485868788898A8B8C8D8E8F'x
     90 '909192939495969798999A9B9C9D9E9F'x
     A0 'A0A1A2A3A4A5A6A7A8A9AAABACADAEAF'x
     B0 'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'x
     C0 'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'x
     D0 'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'x
     E0 'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'x
     F0 'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'x
```

Part 11

Values for Locale, Encoding, and Transcoding

Chapter 18

Values for the LOCALE= System Option

LOCALE= Values and Default Settings for ENCODING, PAPERSIZE, DFLANG, and DATESTYLE Options

The following table lists the valid LOCALE= values, specified by using the SAS name or the Posix name. The alias name is also listed. Some locales do not have an alias.

Table 18.1 *Values for the LOCALE= System Option*

SAS Name	Posix Locale	Aliases
Afrikaans_SouthAfrica	af_ZA	Afrikaans af
Albanian_Albania	sq_AL	Albanian sq
Arabic_Algeria	ar_DZ	
Arabic_Bahrain	ar_BH	
Arabic_Egypt	ar_EG	
Arabic_India	ar_IN	
Arabic_Iraq	ar_IQ	
Arabic_Jordan	ar_JO	
Arabic_Kuwait	ar_KW	
Arabic_Lebanon	ar_LB	

SAS Name	Posix Locale	Aliases
Arabic_Libya	ar_LY	
Arabic_Morocco	ar_MA	
Arabic_Oman	ar_OM	
Arabic_Qatar	ar_QA	
Arabic_SaudiArabia	ar_SA	
Arabic_Sudan	ar_SD	
Arabic_Syria	ar_SY	
Arabic_Tunisia	ar_TN	
Arabic_UnitedArabEmirates	ar_AE	Arabic ar
Arabic_Yemen	ar_YE	
Bengali_India	bn_IN	Bengali bn
Bosnian_BosniaHerzegovina	bs_BA	Bosnian bs
Bulgarian_Bulgaria	bg_BG	Bulgarian bg
Byelorussian_Belarus	be_BY	Byelorussian Belarusian Byelorussian_Belarus be
Catalan_Spain	ca_ES	Catalan ca
Chinese_China	zh_CN	Chinese zh
Chinese_HongKong	zh_HK	
Chinese_Macau	zh_MO	
Chinese_Singapore	zh_SG	
Chinese_Taiwan	zh_TW	

SAS Name	Posix Locale	Aliases
Cornish_UnitedKingdom	kw_GB	Cornish kw
Croatian_BosniaHerzegovina	hr_BA	
Croatian_Croatia	hr_HR	Croatian hr
Czech_CzechRepublic	cs_CZ	Czech cs
Danish_Denmark	da_DK	Danish da
Dutch_Belgium	nl_BE	
Dutch_Netherlands	nl_NL	Dutch nl
English_Australia	en_AU	
English_Belgium	en_BE	
English_Botswana	en_BW	
English_Canada	en_CA	
English_Caribbean	en_CB	
English_HongKong	en_HK	
English_India	en_IN	
English_Ireland	en_IE	
English_Jamaica	en_JM	
English_NewZealand	en_NZ	
English_Philippines	en_PH	
English_Singapore	en_SG	
English_SouthAfrica	en_ZA	
English_UnitedKingdom	en_GB	
English_UnitedStates	en_US	English en

SAS Name	Posix Locale	Aliases
English_Zimbabwe	en_ZW	
Estonian_Estonia	et_EE	Estonian et
Faroese_FaroeIslands	fo_FO	Faroese fo
Finnish_Finland	fi_FI	Finnish fi
French_Belgium	fr_BE	
French_Canada	fr_CA	
French_France	fr_FR	French fr
French_Luxembourg	fr_LU	
French_Switzerland	fr_CH	
German_Austria	de_AT	
German_Germany	de_DE	German de
German_Liechtenstein	de_LI	
German_Luxembourg	de_LU	
German_Switzerland	de_CH	
Greek_Greece	el_GR	Greek el
Greenlandic_Greenland	kl_GL	Greenlandic kl
Hebrew_Israel	he_IL	Hebrew he
Hindi_India	hi_IN	Hindi hi
Hungarian_Hungary	hu_HU	Hungarian hu

SAS Name	Posix Locale	Aliases
Icelandic_Iceland	is_IS	Icelandic is
Indonesian_Indonesia	id_ID	Indonesian id
Italian_Italy	it_IT	Italian it
Italian_Switzerland	it_CH	
Japanese_Japan	ja_JP	Japanese ja
Korean_Korea	ko_KR	Korean ko
Latvian_Latvia	lv_LV	Latvian lv
Lithuanian_Lithuania	lt_LT	Lithuanian lt
Macedonian_Macedonia	mk_MK	Macedonian mk
Malay_Malaysia	ms_MY	Malay ms
Maltese_Malta	mt_MT	Maltese mt
ManxGaelic_UnitedKingdom	gv_GB	ManxGaelic gv
Marathi_India	mr_IN	Marathi mr
NorwegianBokmal_Norway	nb_NO	NorwegianBokmal nb
NorwegianNynorsk_Norway	nn_NO	NorwegianNynorsk nn
Norwegian_Norway	no_NO	Norwegian no

SAS Name	Posix Locale	Aliases
Persian_India	fa_IN	
Persian_Iran	fa_IR	Persian fa
Polish_Poland	pl_PL	Polish pl
Portuguese_Brazil	pt_BR	
Portuguese_Portugal	pt_PT	Portuguese pt
Romanian_Romania	ro_RO	Romanian ro
Russian_Russia	ru_RU	Russian ru
Russian_Ukraine	ru_UA	
Serbian_BosniaHerzegovina	sr_BA	
Serbian_Montenegro	sr_ME	
Serbian_Serbia	sr_RS	Serbian sr
Serbian_Yugoslavia	sr_YU	
SerbianLatin_BosniaHerzegovina	sh_BA	
SerbianLatin_Montenegro	sh_ME	
SerbianLatin_Serbia	sh_RS	SerbianLatin sh
Slovak_Slovakia	sk_SK	Slovak Slovakian Slovakian_Slovakia sk
Slovenian_Slovenia	sl_SI	Slovenian sl
Spanish_Argentina	es_AR	
Spanish_Bolivia	es_BO	

SAS Name	Posix Locale	Aliases
Spanish_Chile	es_CL	
Spanish_Colombia	es_CO	
Spanish_CostaRica	es_CR	
Spanish_DominicanRepublic	es_DO	
Spanish_Ecuador	es_EC	
Spanish_ElSalvador	es_SV	
Spanish_Guatemala	es_GT	
Spanish_Honduras	es_HN	
Spanish_Mexico	es_MX	
Spanish_Nicaragua	es_NI	
Spanish_Panama	es_PA	
Spanish_Paraguay	es_PY	
Spanish_Peru	es_PE	
Spanish_PuertoRico	es_PR	
Spanish_Spain	es_ES	Spanish es
Spanish_UnitedStates	es_US	
Spanish_Uruguay	es_UY	
Spanish_Venezuela	es_VE	
Swedish_Sweden	sv_SE	Swedish sv
Tamil_India	ta_IN	Tamil ta
Telugu_India	te_IN	Telugu te
Thai_Thailand	th_TH	Thai th

SAS Name	Posix Locale	Aliases
Turkish_Turkey	tr_TR	Turkish tr
Ukrainian_Ukraine	uk_UA	Ukrainian uk
Vietnamese_Vietnam	vi_VN	Vietnamese vi

The following table lists the valid Posix values and the default settings for the ENCODING= option, by operating environment. The settings for DFLANG, DATESTYLE, and PAPERSIZE system options are set automatically.

Here is an example:

```
sas9 -locale arabic_algeria
```

When the Arabic_Algeria LOCALE= value is specified, corresponding default settings for the system options are as follows:

```
DFLANG=English
DATESTYLE=DMY
PAPERSIZE=A4
```

Table 18.2 *Default Values for the ENCODING, DFLANG, DATESTYLE, and PAPERSIZE System Options Based on the LOCALE= System Option*

Posix Locale	Windows Encoding	UNIX Encoding	z/OS Encoding	DFLANG=	DATESTYLE=	PAPERSIZE=
af_ZA	wlatin1	latin1	open_ed-1047	English	YMD	A4
ar_AE	warabic	arabic	open_ed-425	English	DMY	A4
ar_BH	warabic	arabic	open_ed-425	English	DMY	A4
ar_DZ	warabic	arabic	open_ed-425	English	DMY	A4
ar_EG	warabic	arabic	open_ed-425	English	DMY	A4
ar_IN	warabic	arabic	open_ed-425	English	DMY	A4
ar_IQ	warabic	arabic	open_ed-425	English	DMY	A4
ar_JO	warabic	arabic	open_ed-425	English	DMY	A4
ar_KW	warabic	arabic	open_ed-425	English	DMY	A4
ar_LB	warabic	arabic	open_ed-425	English	DMY	A4
ar_LY	warabic	arabic	open_ed-425	English	DMY	A4

Posix Locale	Windows Encoding	UNIX Encoding	z/OS Encoding	DFLANG=	DATESTYLE=	PAPERSIZE=
ar_MA	warabic	arabic	open_ed-425	English	DMY	A4
ar_OM	warabic	arabic	open_ed-425	English	DMY	A4
ar_QA	warabic	arabic	open_ed-425	English	DMY	A4
ar_SA	warabic	arabic	open_ed-425	English	DMY	A4
ar_SD	warabic	arabic	open_ed-425	English	DMY	A4
ar_SY	warabic	arabic	open_ed-425	English	DMY	A4
ar_TN	warabic	arabic	open_ed-425	English	DMY	A4
ar_YE	warabic	arabic	open_ed-425	English	DMY	A4
be_BY	wcyrillic	cyrillic	open_ed-1025	English	DMY	A4
bg_BG	wcyrillic	cyrillic	open_ed-1025	English	YMD	A4
bn_IN	wlatin1	latin1	open_ed-1047	English	DMY	A4
ca_ES	wlatin1	latin1	open_ed-1148	English	DMY	A4
cs_CZ	wlatin2	latin2	open_ed-870	Czech	DMY	A4
da_DK	wlatin1	latin9	open_ed-1142	Danish	DMY	A4
de_AT	wlatin1	latin9	open_ed-1141	German	DMY	A4
de_CH	wlatin1	latin9	open_ed-1148	Swiss_ German	DMY	A4
de_DE	wlatin1	latin9	open_ed-1141	German	DMY	A4
de_LI	wlatin1	latin9	open_ed-1141	German	DMY	A4
de_LU	wlatin1	latin9	open_ed-1141	German	DMY	A4
el_GR	wgreek	greek	open_ed-875	English	DMY	A4
en_AU	wlatin1	latin1	open_ed-1047	English	DMY	A4
en_BE	wlatin1	latin9	open_ed-1148	English	DMY	A4
en_BW	wlatin1	latin1	open_ed-1047	English	DMY	A4
en_CA	wlatin1	latin1	open_ed-1047	English	DMY	letter
en_CB	wlatin	latin1	open_ed-1047	English	MDY	letter

Posix Locale	Windows Encoding	UNIX Encoding	z/OS Encoding	DFLANG=	DATESTYLE=	PAPERSIZE=
en_GB	wlatin1	latin9	open_ed-1146	English	DMY	A4
en_HK	wlatin1	latin9	open_ed-1146	English	DMY	A4
en_IE	wlatin1	latin9	open_ed-1146	English	DMY	A4
en_IN	wlatin1	latin9	open_ed-1146	English	DMY	A4
en_JM	wlatin1	latin1	open_ed-1047	English	DMY	letter
en_NZ	wlatin1	latin1	open_ed-1047	English	DMY	A4
en_PH	wlatin1	latin1	open_ed-1047	English	MDY	A4
en_SG	wlatin1	latin9	open_ed-1146	English	DMY	A4
en_US	wlatin1	latin1	open_ed-1047	English	MDY	A4
en_ZA	wlatin1	latin1	open_ed-1047	English	DMY	A4
en_ZW	wlatin1	latin1	open_ed-1047	English	DMY	A4
es_AR	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_BO	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_CL	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_CO	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_CR	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_DO	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_EC	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_ES	wlatin1	latin9	open_ed-1145	Spanish	DMY	A4
es_GT	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_HN	wlatin1	latin1	open_ed-1047	Spanish	MDY	letter
es_MX	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_NI	wlatin1	latin1	open_ed-1047	Spanish	MDY	letter
es_PA	wlatin1	latin1	open_ed-1047	Spanish	MDY	letter
es_PE	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_PR	wlatin1	latin1	open_ed-1047	Spanish	MDY	letter

Posix Locale	Windows Encoding	UNIX Encoding	z/OS Encoding	DFLANG=	DATESTYLE=	PAPERSIZE=
es_PY	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_SV	wlatin1	latin1	open_ed-1047	Spanish	MDY	letter
es_US	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
es_UY	wlatin1	latin1	open_ed-1047	Spanish	DMY	A4
es_VE	wlatin1	latin1	open_ed-1047	Spanish	DMY	letter
et_EE	wbaltic	latin6	open_ed-1122	English	DMY	A4
fa_IN	warabic	arabic	open_ed-1097	English	YMD	A4
fa_IR	warabic	arabic	open_ed-1097	English	YMD	A4
fi_FI	wlatin1	latin9	open_ed-1143	Finnish	DMY	A4
fo_FO	wlatin1	latin1	open_ed-1047	English	DMY	A4
fr_BE	wlatin1	latin9	open_ed-1148	French	DMY	A4
fr_CA	wlatin1	latin1	open_ed-1047	French	DMY	letter
fr_CH	wlatin1	latin9	open_ed-1148	Swiss_French	DMY	A4
fr_FR	wlatin1	latin9	open_ed-1147	French	DMY	A4
fr-LU	wlatin1	latin9	open_ed-1147	French	DMY	A4
gv_GB	wlatin1	latin8	open_ed-1148	English	DMY	A4
he_IL	whebrew	hebrew	open_ed-424	English	DMY	A4
hi_IN	pciscii806	latin1	open_ed-1137	English	DMY	A4
hr_HR	wlatin2	latin2	open_ed-870	Croatian	YMD	A4
hu_HU	wlatin2	latin2	open_ed-870	Hungarian	YMD	A4
is_IS	wlatin1	latin1	open_ed-1047	English	DMY	A4
id_ID	wlatin1	latin1	open_ed-1047	English	DMY	A4
it_CH	wlatin1	latin9	open_ed-1148	Italian	DMY	A4
it_IT	wlatin1	latin9	open_ed-1144	Italian	DMY	A4
ja_JP	shift-jis	euc-jp, shift-jis(*)	ibm-939	Japanese	YMD	A4

Posix Locale	Windows Encoding	UNIX Encoding	z/OS Encoding	DFLANG=	DATESTYLE=	PAPERSIZE=
kl_GL	wlatin1	latin1	open_ed-1047	English	DMY	A4
ko_KR	euc-kr	euc-kr	ibm-933	Locale	YMD	A4
kw_GB	wlatin1	latin1	open_ed-1148	English	DMY	A4
lt_LT	wbaltic	latin6	open_ed-1112	English	YMD	A4
lv_LV	wbaltic	latin6	open_ed-1112	English	YMD	A4
mk_MK	wcyrillic	cyrillic	open_ed-1154	English	DMY	A4
mr_IN	pciscii806	latin1	open_ed-1137	English	DMY	A4
ms_MY	wlatin1	latin1	open_ed-1047	English	DMY	A4
mt_MT	wlatin1	latin3	open_ed-905	English	DMY	A4
nb_NO	wlatin1	latin9	open_ed-1142	Norwegian	DMY	A4
nl_BE	wlatin1	latin1	open_ed-1148	Dutch	DMY	A4
nl_NL	wlatin1	latin1	open_ed-1140	Dutch	DMY	A4
nn_NO	wlatin1	latin9	open_ed-1142	Norwegian	DMY	A4
no_NO	wlatin1	latin9	open_ed-1142	Norwegian	DMY	A4
pl_PL	wlatin2	latin2	open_ed-870	Polish	YMD	A4
pt_BR	wlatin1	latin1	open_ed-275	Portuguese	DMY	letter
pt_PT	wlatin1	latin1	open_ed-1140	Portuguese	DMY	A4
ro_RO	wlatin2	latin2	open_ed-870	English	DMY	A4
ru_RU	wcyrillic	cyrillic	open_ed-1025	Russian	DMY	A4
ru_UA	wcyrillic	cyrillic	open_ed-1154	Russian	DMY	A4
sh_YU	wlatin2	latin2	open_ed-870	English	DMY	A4
sk_SK	wlatin2	latin2	open_ed-870	English	DMY	A4
sl_SL	wlatin2	latin2	open_ed-870	Slovenian	YMD	A4
sr_YU	wcyrillic	cyrillic	open_ed-1025	English	DMY	A4
sq_AL	wlatin2	latin2	open_ed-1153	English	YMD	A4
sv_SE	wlatin1	latin9	open_ed-1143	Swedish	YMD	A4

Posix Locale	Windows Encoding	UNIX Encoding	z/OS Encoding	DFLANG=	DATESTYLE=	PAPERSIZE=
ta_IN	wlatin1	latin1	open_ed-1047	English	DMY	A4
te_IN	wlatin1	latin1	open_ed-1047	English	DMY	A4
th_TH	pcoem874	thai	open_ed-1160	English	DMY	A4
tr_TR	wturkish	latin5	open_ed-1026	English	DMY	A4
uk_UA	wcyrillic	cyrillic	open_ed-1025	English	DMY	A4
vi_VN	wvietnamese	latin1	open_ed-1164	English	DMY	A4
zh_CN	euc-cn	euc-cn	ibm-935	Locale	YMD	A4
zh_HK	ms-950	euc-tw, ms-950 (*)	ibm-937	Locale	YMD	A4
zh_MO	ms-950	euc-tw, mis-950 (*)	ibm-937	Locale	YMD	A4
zh_SG	euc-cn	euc-cn	ibm-935	Locale	DMY	A4
zh_TW	ms-950	euc-tw, ms-950 (*)	ibm-937	Locale	YMD	A4

[1]

[1] (*) depend on the platform

Chapter 19

SAS System Options for Processing DBCS Data

Overview to System Options Used in a SAS Session for DBCS

You use the DBCSLANG= and DBCSTYPE= system options to specify the DBCS encoding values for a SAS session. You do not directly use the ENCODING= system option when you are using DBCS.

DBCS Values for a SAS Session

The following table shows the supported values for the DBCSLANG= and DBCSTYPE= system options under the z/OS, UNIX, and Windows operating environments.

Note: If an encoding value contains a hyphen (-), enclose the encoding value in quotation marks.

Table 19.1 *DBCS Supported Values for the DBCSLANG= and DBCSTYPE= System Options*

DBCSLANG=	z/OS DBCSTYPE=	UNIX DBCSTYPE=	Windows DBCSTYPE=
Chinese	ibm	dec	pcms
Chinese	not applicable	hp15	not applicable
Chinese	not applicable	euc	not applicable
Chinese	not applicable	pcms	not applicable
Japanese	ibm	dec	pcms
Japanese	pcibm	euc	sjis

DBCSLANG=	z/OS DBCSTYPE=	UNIX DBCSTYPE=	Windows DBCSTYPE=
Japanese	not applicable	hp15	not applicable
Japanese	not applicable	sjis	not applicable
Korean	ibm	pcibm	pcms
Korean	not applicable	pcms	not applicable
Korean	not applicable	dec	not applicable
Korean	not applicable	euc	not applicable
Korean	not applicable	hp15	not applicable
Taiwanese	ibm	dec	pcms
Taiwanese	pcibm	euc	not applicable
Taiwanese	not applicable	hp15	not applicable
Taiwanese	not applicable	pcms	not applicable

Chapter 20

Encoding Values in SAS Language Elements

Overview to SAS Language Elements That Use Encoding Values

When the encoding of the SAS session is different from the encoding of the SAS file or from the data that resides in the SAS file, transcoding must occur. Consider a SAS file that was created in the Western Latin1 encoding, then moved to an IBM mainframe that uses the German EBCDIC encoding. In order for the IBM mainframe to successfully access the file, the SAS data file must be transcoded from the Western Latin1 encoding to the German EBCDIC encoding. For information about transcoding concepts, including SAS language elements that contain options for transcoding, see "Transcoding for NLS" on page 27 .

SBCS, DBCS, and Unicode Encoding Values for Transcoding Data

The following table presents a list of SBCS, DBCS, and Unicode encoding values for transcoding data for all operating environments. The encoding values are valid for SAS language elements that contain options for transcoding.

Note: If an encoding value contains a hyphen (-), enclose the encoding value in quotation marks.

Table 20.1 *SBCS, DBCS, and Unicode Encoding Values Used to Transcode Data*

Encoding Name	Short Name	Description	Maximum Characters Per Byte
aarabic	aara	Arabic Macintosh	1
agreek	agrk	Greek Macintosh	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
ahebrew	aheb	Hebrew Macintosh	1
aiceland	aice	Icelandic Macintosh	1
any	anye	no transcoding is specified	1
arabic	arab	Arabic ISO	1
aroman	arom	Roman Macintosh	1
athai	atha	MacOS 21-Thai	1
aturkish	atur	Turkish Macintosh	1
aukrainian	aukr	Ukrainian Macintosh	1
big5	big5	Traditional Chinese Big5	2
cyrillic	cyrl	Cyrillic ISO	1
dec-cn	zvms	Simplified Chinese DEC	4
dec-jp	jvms	Japanese DEC	2
dec-tw	yvms	Traditional Chinese DEC	4
ebcdic037	e037	North American EBCDIC	1
ebcdic275	e275	Brazil EBCDIC	1
ebcdic424	e424	Hebrew EBCDIC	1
ebcdic425	e425	Arabic EBCDIC	1
ebcdic500	e500	International EBCDIC	1
ebcdic838	e838	Thai EBCDIC	1
ebcdic870	e870	Central European EBCDIC	1
ebcdic875	e875	Greek EBCDIC	1
ebcdic905	e905	Latin 3 EBCDIC	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
ebcdic924	e924	European EBCDIC	1
ebcdic1025	ecyr	Cyrillic EBCDIC	1
ebcdic1026	etur	Turkish EBCDIC	1
ebcdic1047	elat	Western EBCDIC	1
ebcdic1097	e097	Farsi Bilingual EBCDIC	1
ebcdic1112	ebal	Baltic EBCDIC	1
ebcdic1122	eest	Estonian EBCDIC	1
ebcdic1130	evie	Vietnamese EBCDIC	1
ebcdic1137	e137	Devanagari EBCDIC	1
ebcdic1140	e140	North American EBCDIC	1
ebcdic1141	e141	Austria/Germany EBCDIC	1
ebcdic1142	e142	Denmark/Norway EBCDIC	1
ebcdic1143	e143	Finland/Sweden EBCDIC	1
ebcdic1144	e144	Italy EBCDIC	1
ebcdic1145	e145	Spain EBCDIC	1
ebcdic1146	e146	United Kingdom EBCDIC	1
ebcdic1147	e147	France EBCDIC	1
ebcdic1148	e148	International EBCDIC	1
ebcdic1149	e149	Iceland EBCDIC	1
ebcdic1153	e153	Latin 2 Euro EBCDIC	1
ebcdic1154	e154	Cyrillic Euro EBCDIC	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
ebcdic1155	e155	Turkey Euro EBCDIC	1
ebcdic1156	e156	Baltic Euro EBCDIC	1
ebcdic1157	e157	Estonia Euro EBCDIC	1
ebcdic1158	e158	Cryillic Ukraine Euro EBCDIC	1
ebcdic1160	e160	cp1160 EBCDIC	1
ebcdic1164	e164	cp1164 EBCDIC	1
ebcdicany	eany	enables you to create a data set that is compatible with all EBCDIC encodings	1
euc-cn	zeuc	Simplified Chinese EUC	2
euc-jp	jeuc	Japanese EUC	4
euc-kr	keuc	Korean EUC	4
euc-tw	yeuc	Traditional Chinese EUC	4
fujitsu-cn	zfuj	Simplified Chinese FACOM	4
fujitsu-jp	jfug	Japanese FACOM	4
fujitsu-ko	kfuj	Korean FACOM	4
fujitsu-tw	yfuj	Traditional Chinese FACOM	4
gb18030	gbke	Simplified Chinese GB18030	4
greek	grek	Greek ISO	1
hebrew	hebr	Hebrew ISO	1
hitachi-cn	zhit	Simplified Chinese HITAC	6
hitachi-jp	jhit	Japanese HITAC	6

Encoding Name	Short Name	Description	Maximum Characters Per Byte
hitachi-ko	khit	Korean HITAC	6
hitachi-tw	yhit	Traditional Chinese HITAC	4
hitsas-jp	jhts	Japanese XHITAC	4
hitsas-ko	khts	Korean XHITAC	4
hitsas-tw	yhts	Traditional Chinese XHITAC	4
hp15-tw	yhpx	Traditional Chinese HP15	2
ibm-1381	zpce	Simplified Chinese PCIBM	2
ibm-930	j930	Japanese Katakana	4
ibm-933	kibm	Korean IBM	4
ibm-935	zibm	Simplified Chinese IBM	4
ibm-937	yibm	Traditional Chinese IBM	4
ibm-939	jibm	Japanese IBM	4
ibm-942	j942	Japanese PCIBM	2
ibm-949	kpce	Korean PCIBM	2
iso2022cncns	zist	Traditional Chinese ISO-2022	4
iso2022cngb	ziso	Simplified Chinese ISO-2022	4
iso2022jp	jiso	Japanese ISO-2022	8
iso2022kr	kiso	Korean ISO-2022	4
latin1	lat1	Western ISO	1
latin2	lat2	Central European ISO	1
latin3	lat3	Latin 3 ISO 8859/3	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
latin4	lat4	Latin 4 ISO 8859/4	1
latin5	lat5	Turkish ISO	1
latin6	lat6	Baltic ISO	1
latin8	lat8	Latin 8 ISO 8859/14	1
latin9	lat9	European ISO	1
macos-1	jmac	Japanese PCMAC	2
macos-2	ymac	Traditional Chinese PCMAC	2
macos-3	kmac	Korean PCMAC	2
macos-25	zmac	Simplified Chinese PCMAC	2
ms-932	j932	Japanese PCMS	2
ms-936	zwin	Simplified Chinese PCMS	2
ms-949	kwin	Korean PCMS	2
ms-950	ywin	Traditional Chinese PCMS	2
msdos720	p720	Arabic MS-DOS	1
msdos737	p737	Greek MS-DOS	1
msdos775	p775	Baltic MS-DOS	1
open_ed-037	eous	USA Open Edition	1
open_ed-275	eobr	Brazil OpenEdition	1
open_ed-424	eoiw	Hebrew OpenEdition	1
open_ed-425	eoa2	Arabic OpenEdition	1
open_ed-838	eoth	Thai OpenEdition	1
open_ed-870	eol2	Central European OpenEdition	1
open_ed-875	eoel	Greek OpenEdition	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
open_ed-905	eol3	Latin 3 Open Edition EBCDIC	1
open_ed-924	eolt	European OpenEdition	1
open_ed-930	oe30	Katakana OpenEdition	4
open_ed-933	oe33	Korean OpenEdition	4
open_ed-935	oe35	Simplified Chinese OpenEdition	4
open_ed-937	oe37	Traditional Chinese OpenEdition	4
open_ed-939	oe39	Japanese IBM	4
open_ed-1025	eocy	Cyrillic OpenEdition	1
open_ed-1026	eotr	Turkish OpenEdition	1
open_ed-1047	eol1	Western OpenEdition	1
open_ed-1097	eofa	Farsi Bilingual OpenEdition EBCDIC	1
open_ed-1112	eobl	Baltic OpenEdition	1
open_ed-1122	eoet	Estonian OpenEdition	1
open_ed-1130	eovi	Vietnamese OpenEdition	1
open_ed-1140	eo40	North American OpenEdition	1
open_ed-1141	e041	Austria/Germany OpenEdition	1
open_ed-1142	e042	Denmark/Norway OpenEdition	1
open_ed-1143	e043	Finland/Sweden OpenEdition	1
open_ed-1144	e044	Italy OpenEdition	1
open_ed-1145	e045	Spain OpenEdition	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
open_ed-1146	e046	United Kingdom OpenEdition	1
open_ed-1147	e047	France OpenEdition	1
open_ed-1148	e048	International OpenEdition	1
open_ed-1149	e0IS	Iceland OpenEdition EBCDIC	1
open_ed-1153	e053	Latin 2 Euro OpenEdition EBCDIC	1
open_ed-1154	e054	Cyrillic Euro OpenEdition EBCDIC	1
open_ed-1155	e055	Turkey Euro OpenEdition EBCDIC	1
open_ed-1156	e056	Baltic Euro OpenEdition EBCDIC	1
open_ed-1157	e057	Estonia Euro OpenEdition EBCDIC	1
open_ed-1158	e058	Cryrillic Ukraine Euro 1158 OpenEdition EBCDIC	1
open_ed-1160	e060	1160 OpenEdition EBCDIC	1
open_ed-1164	e064	1164 OpenEdition EBCDIC	1
pciscii806	p806	Indian PC	1
pcoem437	p437	USA IBM-PC	1
pcoem850	p850	Western IBM-PC	1
pcoem852	p852	Central European IBM-PC	1
pcoem857	p857	Turkish IBM-PC	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
pcoem858	p858	European IBM-PC	1
pcoem860	p860	Portuguese MS-DOS	1
pcoem862	p862	Hebrew IBM-PC	1
pcoem863	p863	French Canadian IBM-PC	1
pcoem864	p864	Arabic IBM-PC	1
pcoem865	p865	Nordic IBM-PC	1
pcoem866	p866	Cyrillic IBM-PC	1
pcoem869	p869	Greek IBM-PC	1
pcoem874	p874	Thai IBM-PC	1
pcoem921	p921	Baltic IBM-PC	1
pcoem922	p922	Estonia IBM-PC	1
pcoem1129	pvie	Vietnamese IBM-PC	1
pc1098	po98	Farsi PC	1
roman8	rom8	HP Roman 8	1
shift-jis	sjis	Japanese SJIS	2
thai	thai	Thai ISO	1
us-ascii	ansi	enables you to create a data set that is compatible with all ASCII encodings	1
utf-8	utf8	Unicode (UTF-8)	4
utf-16be	u16b	Unicode (UTF-16BE)	2 *
utf-16le	u16l	Unicode (UTF-16LE)	2 *
utf-32be	u32b	Unicode (UTF-32BE)	4 **
utf-32le	u32l	Unicode (UTF-32LE)	4 **
warabic	wara	Arabic Windows	1
wbaltic	wbal	Baltic Windows	1

Encoding Name	Short Name	Description	Maximum Characters Per Byte
wcyrillic	wcyr	Cyrillic Windows	1
wgreek	wgrk	Greek Windows	1
whebrew	wheb	Hebrew Windows	1
wlatin1	wlt1	Western Windows	1
wlatin2	wlt2	Central European Windows	1
wturkish	wtur	Turkish Windows	1
wvietnamese	wvie	Vietnamese Windows	1

* UTF-16BE and UTF-16LE have a fixed length of two bytes per character.

** UTF-32BE and UTF-32LE have a fixed length of four bytes per character.

Chapter 21

Encoding Values for a SAS Session

UNIX Encoding Values

The encodings in the following tables are valid in UNIX environments.

Note: If an encoding value contains a hyphen (-), enclose the encoding value in quotation marks.

Table 21.1 *Single-Byte Encodings for UNIX*

ENCODING= Value	Description
arabic	Arabic (ISO 8859-6)
cyrillic	Cyrillic (ISO 8859-5)
greek	Greek (ISO 8859-7)
hebrew	Hebrew (ISO 8859-8)
latin1	Western (ISO 8859-1)
latin2	Central Europe (ISO 8859-2)
latin5	Turkish (ISO 8859-9)
latin6	Baltic (ISO 8859-4)
latin8	Celtic (ISO 8859-14)
latin9	European (ISO 8859-15)
thai	Thai (ISO 8859-11)

Table 21.2 *Double-Byte Encodings for UNIX*

ENCODING= Value	Description
big5	Traditional Chinese (Big5)
euc-cn	Simplified Chinese (EUC)
euc-jp	Japanese (EUC)
euc-kr	Korean (EUC)
euc-tw	Traditional Chinese (EUC)
shift-jis	Japanese (SJIS)

UNIX also supports the utf-8 Unicode encoding.

Windows Encoding Values

The encodings in the following tables are valid in the Windows operating environment.

Note: If an encoding-value contains a hyphen (-), enclose the encoding value in quotation marks.

Table 21.3 *Single-Byte Encodings for Windows*

Description	Windows ENCODING= Value	MS-DOS ENCODING= Value	IBM-PC ENCODING= Value
Arabic	warabic	msdos720	pcoem864
Baltic	wbaltic	msdos775	pcoem921
Central Europe	wlatin2	not applicable	pcoem852
Cyrillic	wcyrillic	not applicable	pcoem866 pcoem855
Estonia	wbaltic	not applicable	pcoem922
European	not applicable	not applicable	pcoem858
Farsi	not applicable	not applicable	pc1098
French Canadian	wlatin1	not applicable	pcoem863
Greek	wgreek	msdos737	not applicable

Description	Windows ENCODING= Value	MS-DOS ENCODING= Value	IBM-PC ENCODING= Value
Hebrew	whebrew	not applicable	pcoem862
Indian Script Code	not applicable	not applicable	pciscii806
Nordic	not applicable	not applicable	pcoem865
Portuguese	wlatin1	pcoem860	not applicable
Thai	not applicable	not applicable	pcoem874
Turkish	wturkish	not applicable	pcoem857
USA	wlatin1	not applicable	pcoem437
Vietnamese	wvietnamese	not applicable	not applicable
Western	wlatin1	not applicable	pcoem858

Table 21.4 *Windows Double-Byte Encodings*

Description	PCMS ENCODING= Value	No Vendor ENCODING= Value
Traditional Chinese	ms-950	big5
Simplified Chinese	ms-936	not applicable
Japanese	ms-932	shift-jis
Korean	ms-949	not applicable

Note: Windows also supports the utf-8 Unicode encoding.

z/OS Encoding Values

The encodings in the following tables are valid in the z/OS operating environment.

Note: If an encoding-value contains a hyphen (-), enclose the encoding value in quotation marks.

Table 21.5 *Single-Byte Encodings for z/OS*

Encoding ENCODING= Value	Description
EBCDIC037	EBCDIC cp037- Old North America
EBCDIC275	EBCDIC cp275-Brazil
EBCDIC425	EBCDIC cp425-Arabic
EBCDIC838	EBCDIC cp838-Thai
EBCDIC870	EBCDIC cp870-Central Europe
EBCDIC875	EBCDIC cp875-Greek
EBCDIC905	EBCDIC cp905-Latin 3
EBCDIC924	EBCDIC cp924-Western Europe
EBCDIC1025	EBCDIC cp1025-Cyrillic
EBCDIC1026	EBCDIC cp1026-Turkish
EBCDIC1047	EBCDIC cp1047-Latin1
EBCDIC1097	EBCDIC cp1097-Farsi Bilingual
EBCDIC1112	EBCDIC cp1112-Baltic
EBCDIC1122	EBCDIC cp1122-Estonian
EBCDIC1130	EBCDIC cp1130-Vietnamese
EBCDIC1137	EBCDIC cp1137-Devanagari
EBCDIC1140	EBCDIC cp1140-North America
EBCDIC1141	EBCDIC cp1141-German/Austrian
EBCDIC1142	EBCDIC cp1142-Danish/Norwegian
EBCDIC1143	EBCDIC cp1143-Finnish/Swedish
EBCDIC1144	EBCDIC cp1144-Italian
EBCDIC1145	EBCDIC cp1145-Spanish
EBCDIC1146	EBCDIC cp1146-English (UK)
EBCDIC1147	EBCDIC cp1147-French
EBCDIC1148	EBCDIC cp1148-International

Encoding ENCODING= Value	Description
EBCDIC1149	EBCDIC cp1149-Iceland
EBCDIC1153	EBCDIC cp1153-Latin 2 Multilingual with euro
EBCDIC1154	EBCDIC cp1154-Cyrillic Multilingual with euro
EBCDIC1155	EBCDIC cp1155-Turkey with euro
EBCDIC1156	EBCDIC cp1156-Baltic Multilingual with euro
EBCDIC1157	EBCDIC cp1157-Estonia with euro
EBCDIC1158	EBCDIC cp1158-Cyrillic Ukraine with euro
OPEN_ED-037	OpenEdition EBCDIC cp037-Old North America
OPEN_ED-275	OpenEdition EBCDIC cp275-Brazil
OPEN_ED-425	OpenEdition EBCDIC cp425-Arabic
OPEN_ED-838	OpenEdition EBCDIC cp838-Thai
OPEN_ED-870	OpenEdition EBCDIC cp870-Central Europe
OPEN_ED-875	OpenEdition EBCDIC cp875-Greek
OPEN_ED-905	OpenEdition EBCDIC cp905-Latin 3
OPEN_ED-924	OpenEdition EBCDIC cp924-Western Europe
OPEN_ED-1025	OpenEdition EBCDIC cp1025-Cyrillic
OPEN_ED-1026	OpenEdition EBCDIC cp1026-Turkish
OPEN_ED-1047	OpenEdition EBCDIC cp1047-Latin1
OPEN_ED_1097	OpenEdition EBCDIC cp1097-Farsi Bilingual
OPEN_ED-1112	OpenEdition EBCDIC cp1112-Baltic
OPEN_ED-1122	OpenEdition EBCDIC cp1122-Estonian
OPEN_ED-1130	OpenEdition EBCDIC cp1130-Vietnamese
OPEN_ED-1137	OpenEdition EBCDIC cp1137-Devanagari
OPEN_ED-1140	OpenEdition EBCDIC cp1140-North America
OPEN_ED-1141	OpenEdition EBCDIC cp1141-German/Austrian
OPEN_ED-1142	OpenEdition EBCDIC cp1142-Danish/Norwegian

Encoding ENCODING= Value	Description
OPEN_ED-1143	OpenEdition EBCDIC cp1143-Finnish/Swedish
OPEN_ED-1144	OpenEdition EBCDIC cp1144-Italian
OPEN_ED-1145	OpenEdition EBCDIC cp1145-Spanish
OPEN_ED-1146	OpenEdition EBCDIC cp1146-English (UK)
OPEN_ED-1147	OpenEdition EBCDIC cp1147-French
OPEN_ED-1148	OpenEdition EBCDIC cp1148-International
OPEN_ED-1149	OpenEdition EBCDIC cp1149-Iceland
OPEN_ED-1153	OpenEdition EBCDIC cp1153-Latin 2 Multilingual with euro
OPEN_ED-1154	OpenEdition EBCDIC cp1154-Cyrillic Multilingual with euro
OPEN_ED-1155	OpenEdition EBCDIC cp1155-Turkey with euro
OPEN_ED-1156	OpenEdition EBCDIC cp1156-Baltic Multilingual with euro
OPEN_ED-1157	OpenEdition EBCDIC cp1157-Estonia with euro
OPEN_ED-1158	OpenEdition EBCDIC cp1158-Cyrillic Ukraine with euro

Table 21.6 *Double-Byte Encodings for z/OS*

Description	ENCODING= Value
Japanese	OPEN_ED-939
Korean	OPEN_ED-933
Simplified Chinese	OPEN_ED-935
Traditional Chinese	OPEN_ED-937

Part 12

Appendixes

Appendix 1

Additional NLS Language Elements

Additional NLS Language Elements

The following EUR language elements have been replaced with NL language elements. The EUR elements are supported in SAS 9.3, but SAS recommends that you use the NL elements.

Dictionary

EURDFDD*w*. Format

Writes international date values in the form *dd.mm.yy* or *dd.mm.yyyy*.

Category: Date and Time

Alignment: right

Syntax

EURDFDD*w*.

Syntax Description

w

specifies the width of the output field.

Default: 8 (except Finnish, which is 10)

Range: 2–10

Tip: When *w* is from 2 to 5, SAS prints as much of the month and day as possible. When *w* is 7, the date appears as a two-digit year without slashes, and the value is right-aligned in the output field.

Details

The EURDFDD*w*. format writes SAS date values in the form *dd.mm.yy* or *dd.mm.yyyy*, where

dd
is the two-digit integer that represents the day of the month.

mm
is the two-digit integer that represents the month.

yy or *yyyy*
is a two-digit or four-digit integer that represents the year.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= system option.

Example

The example table uses the input value 15342, which is the SAS date value that corresponds to January 2, 2002. The first PUT statement assumes that the DFLANG= system option is set to Spanish.

```
options dflang=spanish;
```

The second PUT statement uses the Spanish language prefix in the format to write the international date value. The third PUT statement uses the French language prefix in the format to write the international date value. Therefore, the value of the DFLANG= option is ignored.

```
options dflang=spanish;
data _null_;
  input day;
  put day eurdfdd8.;
  datalines;
  15342
  ;
```

Statement	Result
	`----+----1`
`put date eurdfdd8.;`	`02.01.02`
`put date espdfdd8.;`	`02.01.02`
`put date fradfdd8.;`	`02/01/02`

EURDFDE*w*. Format

Writes international date values in the form *ddmmmyy* or *ddmmmyyyy*.

Category: Date and Time

Alignment: right

Syntax

EURDFDE*w*.

Syntax Description

w

specifies the width of the output field.

Default: 7 (except Finnish)

Range: 5–9 (except Finnish)

Note: If you use the Finnish (FIN) language prefix, the *w* range is 9–10 and the default is 9.

Details

The EURDFDE*w*. format writes SAS date values in the form *ddmmmyy* or *ddmmmyyyy*:

dd

is an integer that represents the day of the month.

mmm

is the first three letters of the month name.

yy or *yyyy*

is a two-digit or four-digit integer that represents the year.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats do not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width are larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set, such as UTF-8.

Example

The example table uses the input value 15342, which is the SAS date value that corresponds to January 2, 2002. The first PUT statement assumes that the DFLANG= system option is set to Spanish.

```
options dflang=spanish;
```

The second PUT statement uses the Spanish language prefix in the format to write the international date value in Spanish. The third PUT statement uses the French language prefix in the format to write the international date value in French. Therefore, the value of the DFLANG= option is ignored.

```
options dflang=spanish;
data _null_;
   input day;
   put day eurdfde9.;
   put day espdfde9.;
   put day fradfde9.;
   datalines;
   15342
 ;
```

Statements	Results
	----+----1
put date eurdfde9.;	02ene2002
put date espdfde9.;	02ene2002
put date fradfde9.;	02jan2002

EURDFDN*w*. Format

Writes international date values as the day of the week.

Category: Date and Time

Alignment: right

Syntax

EURDFDN*w*.

Syntax Description

w
specifies the width of the output field.

Default: 1

Range: 1–32

Details

The EURDFDN*w*. format writes SAS date values in the form *day-of-the-week*:

day-of-the-week
is represented as 1=Monday, 2=Tuesday, and so on.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site,

you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width are larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Example

The example table uses the input value 15342, which is the SAS date value that corresponds to January 2, 2002. The first PUT statement assumes that the DFLANG= system option is set to Spanish.

```
options dflang=spanish;
```

The second PUT statement uses the Spanish language prefix in the format to write the day of the week in Spanish. The third PUT statement uses the Italian language prefix in the format to write the day of the week in Italian. Therefore, the value of the DFLANG= option is ignored.

```
options dflang=spanish;
data _null_;
  input day;
  put day eurdfdn.;
  put day espdfdn.;
  put day itadfdn.;
  datalines;
  15342
  ;
```

Statements	Results
	`----+----1`
`put day eurdfdn.;`	`3`
`put day espdfdn.;`	`3`
`put day itadfdn.;`	`3`

EURDFDT*w.d* Format

Writes international datetime values in the form *ddmmmyy:hh:mm:ss.ss* or *ddmmmyyyy hh:mm:ss.ss*.

Category: Date and Time

Alignment: right

Syntax

EURDFDT*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 16

Range: 7–40

Tip: If you want to write a SAS datetime value with the date, hour, and seconds, the width (*w*) must be at least 16. Add an additional two places to the width if you want to return values with optional decimal fractions of seconds.

d

specifies the number of digits to the right of the decimal point in the numeric value.

Range: 1–39

Restrictions:

must be less than *w*

If $w - d < 17$, SAS truncates the decimal values.

Details

The EURDFDT*w.d* format writes SAS datetime values in the form *ddmmmyy:hh:mm:ss.ss*:

dd

is an integer that represents the day of the month.

mmm

is the first three letters of the month name.

yy or *yyyy*

is a two-digit or four-digit integer that represents the year.

hh

is the number of hours that range from 00 through 23.

mm

is the number of minutes that range from 00 through 59.

ss.ss

is the number of seconds that range from 00 through 59 with the fraction of a second following the decimal point.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats will not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width will be larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Example

The example table uses the input value of 1347453583, which is the SAS datetime value that corresponds to September 12, 2002, at 12:39:43 p.m. The first PUT statement assumes that the DFLANG= system option is set to German.

```
options dflang=german;
```

The second PUT statement uses the German language prefix in the format to write the international datetime value in German. The third PUT statement uses the Italian language prefix in the format to write the international datetime value in Italian. The value of the DFLANG= option, therefore, is ignored.

```
options dflang=german;
data _null_;
    input date;
    put date= ;
    put date eurdfdt20.;
    put date deudfdt20.;
    put date itadfdt20.;
    datalines;
    1347453583;
;
run;
```

Statements	Results
	----+----1----+----2
put date eurdfdt20.;	12Sep2002:12:39:43
put date deudfdt20.;	12Sep2002:12:39:43
put date itadfdt20.;	12Set2002:12:39:43

EURDFDWN*w*. Format

Writes international date values as the name of the day.

Category: Date and Time

Alignment: right

Syntax

EURDFDWN*w*.

Syntax Description

w

specifies the width of the output field.

The default depends on the language prefix that you use. The following table shows the default value for each language:

Language	Default
Afrikaans (AFR)	9
Catalan (CAT)	9
Croatian (CRO)	10
Czech (CSY)	7
Danish (DAN)	7
Dutch (NLD)	9
Finnish (FIN)	11
French (FRA)	8
German (DEU)	10
Hungarian (HUN)	9
Italian (ITA)	9
Macedonian (MAC)	10
Norwegian (NOR)	7
Polish (POL)	12
Portuguese (PTG)	13
Russian (RUS)	11
Slovenian (SLO)	10
Spanish (ESP)	9
Swedish (SVE)	7
Swiss-French (FRS)	8
Swiss-German (DES)	10

Default: depends on the language prefix you use.

Range: 1–32

Tip: If you omit *w*, SAS prints the entire name of the day.

Details

If necessary, SAS truncates the name of the day to fit the format width. The EURDFDWN*w*. format writes SAS date values in the form *day-name*:

day-name
is the name of the day.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes . When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats do not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width are larger than in the single- byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Example

The following example table uses the input value 15344, which is the SAS date value that corresponds to January 4, 2002. The first PUT statement assumes that the DFLANG= system option is set to French.

```
options dflang=french;
put day eurdfdwn8.;
```

The second PUT statement uses the French language prefix in the format to write the day of the week in French. The third PUT statement uses the Spanish language prefix in the format to write the day of the week in Spanish. Therefore, the value of the DFLANG= option is ignored.

```
options dflang=french;
data _null_;
input day;
put day eurdfdwn8.;
put day fradfdwn8.;
put day espdfdwn8.;
datalines;
15344
;
run;
```

Statements	Results
	----+----1
put day eurdfdwn8.;	Vendredi
put day fradfdwn8.;	Vendredi
put day espdfdwn8.;	viernes

EURDFMN*w*. Format

Writes international date values as the name of the month.

Category: Date and Time

Alignment: right

Syntax

EURDFMN*w*.

Syntax Description

w
specifies the width of the output field.

Default: 9 (except for Finnish and Spanish)

Range: 1–32

Note: If you use the Finnish (FIN) language prefix, the default value for *w* is 11. If you use the Spanish (ESP) language prefix, the default value for *w* is 10.

Details

If necessary, SAS truncates the name of the month to fit the format width. The EURDFMN*w*. format writes SAS date values in the form *month-name*:

month-name
is the name of the month.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats do not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width will be larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Example

The example table uses the input value 15344, which is the SAS date value that corresponds to January 4, 2002. The first PUT statement assumes that the DFLANG= system option is set to Italian.

```
options dflang=ita;
```

The second PUT statement uses the Italian language prefix in the format to write the name of the month in Italian. The third PUT statement uses German language prefix in the format to write the name of the month in German. Therefore, the value of the DFLANG= option is ignored.

```
    options dflang=ita;
    data _null_;
    input day;
    put day eurdfmn10.;
    put day itadfmn10.;
    put day deudfmn10.;
    datalines;
    15344
    ;
run;
```

Statements	Results
	----+----1
put date eurdfmn10.;	janvier
put date itadfmn10.;	Gennaio
put date deudfmn10.;	Januar

EURDFMY*w*. Format

Writes international date values in the form *mmmyy* or *mmmyyyy*.

Category: Date and Time

Alignment: right

Syntax

EURDFMY*w*.

Syntax Description

w

specifies the width of the output field.

Default: 5 (except for Finnish)

Range: 5–7

Note: If you use the Finnish (FIN) language prefix, the value for *w* must be 8, which is the default value.

Details

The EURDFMY*w*. format writes SAS date values in the form *mmmyy*, where

mmm

is the first three letters of the month name.

yy or *yyyy*

is a two-digit or four-digit integer that represents the year.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes . When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats do not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width are larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Example

The example table uses the input value 15342, which is the SAS date value that corresponds to January 2, 2002. The first PUT statement assumes that the DFLANG= system option is set to Spanish.

```
options dflang=spanish;
```

The second PUT statement uses the Spanish language prefix in the format to write the name of the month in Spanish. The third PUT statement uses the French language prefix in the format to write the name of the month in French. Therefore, the value of the DFLANG= option is ignored.

```
options dflang=spanish;
data _null_;
input date;
  put date eurdfmy7.;
  put date espdfmy7.;
  put date fradfmy7.;
datalines;
15342
;
```

Statements	Results
	----+----1
put date eurdfmy7.;	ene2002
put date espdfmy7.;	ene2002
put date fradfmy7.;	jan2002

EURDFWDX*w*. Format

Writes international date values as the name of the month, the day, and the year in the form *dd monthname yy* (or *yyyy*).

Category: Date and Time

Alignment: right

Syntax

EURDFWDX*w*.

Syntax Description

w

specifies the width of the output field.

The default depends on the language prefix that you use. The following table shows the default value for each language:

Language	Maximum	Default
Afrikaans (AFR)	37	29
Catalan (CAT)	40	16
Croatian (CRO)	40	16
Czech (CSY)	40	16
Danish (DAN)	18	18
Dutch (NLD)	37	29
Finnish (FIN)	20	20
French (FRA)	18	18
German (DEU)	18	18
Hungarian (HUN)	40	18
Italian (ITA)	17	17
Macedonian (MAC)	40	17
Norwegian (NOR)	17	17
Polish (POL)	40	20
Portuguese (PTG)	37	23
Russian (RUS)	40	16
Slovenian (SLO)	40	17
Spanish (ESP)	24	24
Swedish (SVE)	17	17
Swiss-French (FRS)	17	17

Language	Maximum	Default
Swiss-German (DES)	18	18

Default: depends on the language prefix you use.

Range: 3–(maximum width)

Tip: If the value for *w* is too small to include the complete day of the week and the month, SAS abbreviates as necessary.

Details

The EURDFWDX*w*. format writes SAS date values in the form *dd month-name yy* or *dd month-name yyyy*:

dd
is an integer that represents the day of the month.

month-name
is the name of the month.

yy or *yyyy*
is a two-digit or four-digit integer that represents the year.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats will not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width will be larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Comparisons

The EURDFWKX*w*. format is the same as the EURDFWDX*w*. format except that EURDFWKX *w*. format adds the day-of-week in front of *dd*.

Example

The example table uses the input value 15342, which is the SAS date value that corresponds to January 2, 2002. The first PUT statement assumes that the DFLANG= system option is set to Dutch.

```
options dflang=dutch;
```

The second PUT statement uses the Dutch language prefix in the format to write the name of the month in Dutch. The third PUT statement uses the Italian language prefix in the format to write the name of the month in Italian. Therefore, the value of the DFLANG= option is ignored.

```
options dflang=dutch;
data _null_;
```

```
input date;
put date eurdfwdx29.;
put date nlddfwdx29.
put date itadfwdx17.;
datalines;
15342
;
```

Statements	Results
	----+----1----+----2----+----3
put day eurdfwdx29.;	2 januari 2002
put day nlddfwdx29.;	2 januari 2002
put day itadfwdx17.;	02 Gennaio 1998

EURDFWKX*w*. Format

Writes international date values as the name of the day and date in the form *day-of-week*, *dd month-name yy* (or *yyyy*).

Category: Date and Time

Alignment: right

Syntax

EURDFWKX*w*.

Syntax Description

w

specifies the width of the output field.

The default depends on the language prefix that you use. The following table shows the default value for each language:

Language	Minimum	Maximum	Default
Afrikaans (AFR)	2	38	28
Catalan (CAT)	2	40	27
Croatian (CRO)	3	40	27
Czech (CSY)	2	40	25
Danish (DAN)	2	31	31

Language	Minimum	Maximum	Default
Dutch (NLD)	2	38	28
Finnish (FIN)	2	37	37
French (FRA)	3	27	27
German (DEU)	3	30	30
Hungarian (HUN)	3	40	28
Italian (ITA)	3	28	28
Macedonian (MAC)	3	40	29
Norwegian (NOR)	3	26	26
Polish (POL)	2	40	34
Portuguese (PTG)	3	38	38
Russian (RUS)	2	40	29
Slovenian (SLO)	3	40	29
Spanish (ESP)	1	35	35
Swedish (SVE)	3	26	26
Swiss-French (FRS)	3	26	26
Swiss-German (DES)	3	30	30

Default: depends on the language prefix you use.

Tip: If the value for *w* is too small to include the complete day of the week and the month, SAS abbreviates as necessary.

Details

The EURDFWKX*w*. format writes SAS date values in the form *day-of-week*, *dd month-name yy* (or *yyyy*):

day-of-week
is the name of day.

dd
is an integer that represents the day of the month.

month-name
is the name of the month.

yy or *yyyy*
is a two-digit or four-digit integer that represents the year.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the format, SAS ignores the DFLANG= option.

Note: The EUR-date formats require European character sets and encodings. Some formats do not work correctly using non-European encodings. When running in a DBCS environment, the default format width and max width are larger than in the single-byte system to allow formats to use a double-byte representation of certain characters. However, you must use a session encoding that supports the European characters set like UTF-8.

Comparisons

The EURDFWKX*w*. format is the same as the EURDFWDX*w*. format except that EURDFWKX*w*. format adds day-of-week in front of *dd*.

Example

The example table uses the input value 15344, which is the SAS date value that corresponds to January 4, 2002. The first PUT statement assumes that the DFLANG= system option is set to German.

```
options dflang=German;
```

The second PUT statement uses the German language prefix in the format to write the name of the month in German. The third PUT statement uses the Italian language prefix in the format to write the name of the month in Italian. Therefore, the value of the DFLANG= option is ignored.

```
    options dflang=german;
    data _null_;
    input date;
    put date eurdfwkx30.;
    put date deudfwkx30.;
    put date itadfwkx17.;
    datalines;
    15344
    ;
run;
```

Statements	Results
	----+----1----+----2----+----3
put date eurdfwkx30.;	Freitag, 4. Januar 2002
put date deudfwkx30.;	Freitag, 4. Januar 2002
put date itadfwkx17.;	Ven, 04 Gen 2002

EURFRATS*w.d* Format

Converts an amount from Austrian schillings to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRATS*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRATS *w.d* format converts an amount from Austrian schillings to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRATS*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Austrian schillings, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrats5.;
   put amount eurfrats9.2;
   datalines;
50
5234.56
52345
;
run;
```

```
   E4
    E3,63
 E380
  E380,41
3.804
E3.804,06
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrats5.;	E4
	put amount eurfrats9.2;	E3,63
5234.56	put amount eurfrats5.;	E380
	put amount eurfrats9.2;	E380,41
52345	put amount eurfrats5.;	3.804
	put amount eurfrats9.2;	E3.804,06

EURFRBEF*w.d* Format

Converts an amount from Belgian francs to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRBEF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRBEF*w.d* format converts an amount from Belgian francs to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRBEF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Belgian francs, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrbef5.;
   put amount eurfrbef9.2;
   datalines;
```

```
50
5234.56
52345
;
run;
```

```
8       put amount eurfrbef5.;
9       put amount eurfrbef9.2;
10      datalines;
   E1
    E1,24
 E130
  E129,76
1.298
E1.297,60
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrbef5.;	E1
	put amount eurfrbef9.2;	E1,24
5234.56	put amount eurfrbef5.;	E130
	put amount eurfrbef9.2;	E129,76
52345	put amount eurfrbef5.;	1.298
	put amount eurfrbef9.2;	E1.297,60

EURFRCHF*w.d* Format

Converts an amount from Swiss francs to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRCHF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRCHF*w.d* format converts an amount from Swiss francs to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRCHF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Swiss francs, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrchf5.;
   put amount eurfrchf9.2;
   datalines;
50
1234.56
12345
;
run;
SAS Log:
3       put amount eurfrchf5.;
4       put amount eurfrchf9.2;
5      datalines;
   E31
    E31,17
 E770
  E769,53
7.695
E7.694,94
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrchf5.; put amount eurfrchf9.2;	E31 E31,17
1234.56	put amount eurfrchf5.; put amount eurfrchf9.2;	E770 E769,53
12345	put amount eurfrchf5.; put amount eurfrchf9.2;	7.695 E7.694,94

EURFRDEM*w.d* Format

Converts an amount from Deutsche marks to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRDEM*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRDEM*w.d* format converts an amount from Deutsche marks to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRDEM*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Deutsche marks, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrdem5.;
   put amount eurfrdem9.2;
   datalines;
50
1234.56
12345
;
run;
```

```
8       put amount eurfrdem5.;
9       put amount eurfrdem9.2;
10      datalines;
   E26
    E25,56
 E631
  E631,22
6.312
E6.311,90
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrdem5.;	E26
	put amount eurfrdem9.2;	E25,56

Amounts	Statements	Results
1234.56	put amount eurfrdem5.;	E631
	put amount eurfrdem9.2;	E631,22
12345	put amount eurfrdem5.;	6.312
	put amount eurfrdem9.2;	E6.311,90

EURFRDKK*w.d* Format

Converts an amount from Danish kroner to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRDKK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRDKK*w.d* format converts an amount from Danish kroner to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRDKK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Danish kroner, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrdkk5.;
   put amount eurfrdkk9.2;
   datalines;
50
1234.56
12345
;
run;
```

```
SAS log:
3       put amount eurfrdkk5.;
4       put amount eurfrdkk9.2;
5       datalines;
   E7
    E6,68
 E165
  E164,83
1.648
E1.648,18
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrdkk5.;	E7
	put amount eurfrdkk9.2;	E6,68
1234.56	put amount eurfrdkk5.;	E165
	put amount eurfrdkk9.2;	E164,83
12345	put amount eurfrdkk5.;	1.648
	put amount eurfrdkk9.2;	E1.648,18

EURFRESP*w.d* Format

Converts an amount from Spanish peseta to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRESP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRESP*w.d* format converts an amount from Spanish peseta to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRESP*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Spanish peseta, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfresp5.;
   put amount eurfresp9.2;
   datalines;
200
20234.56
202345
;
run;
```

```
8       put amount eurfresp5.;
9       put amount eurfresp9.2;
10      datalines;
   E1
    E1,20
 E122
  E121,61
1.216
E1.216,12
```

Amounts	Statements	Results
		----+----1----2
200	put amount eurfresp5.;	E1
	put amount eurfresp9.2;	E1,20
20234.56	put amount eurfresp5.;	E122
	put amount eurfresp9.2;	E121,61
202345	put amount eurfresp5.;	1.216
	put amount eurfresp9.2;	E1.216,12

EURFRFIM*w.d* Format

Converts an amount from Finnish markkas to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRFIM*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRFIM*w.d* format converts an amount from Finnish markkas to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRFIM*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Finnish markkas, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrfim5.;
   put amount eurfrfim9.2;
   datalines;
50
1234.56
12345
;
run;
```

```
8       put amount eurfrfim5.;
9       put amount eurfrfim9.2;
10      datalines;
   E8
    E8,41
 E208
  E207,64
2.076
E2.076,28
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrfim5.; put amount eurfrfim9.2;	E8 E8,41
1234.56	put amount eurfrfim5.; put amount eurfrfim9.2;	E208 E207,64
12345	put amount eurfrfim5.; put amount eurfrfim9.2;	2.076 E2.076,28

EURFRFRF*w.d* Format

Converts an amount from French francs to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRFRF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRFRF*w.d* format converts an amount from French francs to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRFRF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in French francs, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrfrf5.;
   put amount eurfrfrf9.2;
   datalines;
50
1234.56
12345
;
run;
SAS log:
   E8
    E7,62
 E188
  E188,21
1.882
E1.881,98
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrfrf5.;	E8
	put amount eurfrfrf9.2;	E7,62
1234.56	put amount eurfrfrf5.;	E188
	put amount eurfrfrf9.2;	E188,21
12345	put amount eurfrfrf5.;	1.882
	put amount eurfrfrf9.2;	E1.881,98

EURFRGBP*w.d* Format

Converts an amount from British pounds to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRGBP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRGBP*w.d* format converts an amount from British pounds to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRGBP*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in British pounds, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrgbp5.;
   put amount eurfrgbp9.2;
   datalines;
```

```
50
1234.56
12345
;
run;
SAS log:
3       put amount eurfrgbp5.;
4       put amount eurfrgbp9.2;
5      datalines;
   E71
    E71.42
1,763
E1,763.32
17632
17,632.39
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrgbp5.;	E71
	put amount eurfrgbp9.2;	E71.42
1234.56	put amount eurfrgbp5.;	1,763
	put amount eurfrgbp9.2;	E1,763.32
12345	put amount eurfrgbp5.;	17632
	put amount eurfrgbp9.2;	17,632.39

EURFRGRD*w.d* Format

Converts an amount from Greek drachmas to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRGRD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRGRD*w.d* format converts an amount from Greek drachmas to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRGRD*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Greek drachmas, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrgrd5.;
   put amount eurfrgrd9.2;
   datalines;
400
40234.56
402345
;
run;
SAS log:
3       put amount eurfrgrd5.;
4       put amount eurfrgrd9.2;
5      datalines;
   E1
    E1,17
 E118
  E118,03
1.180
E1.180,30
```

Amounts	Statements	Results
		----+----1----2
400	put amount eurfrgrd5.; put amount eurfrgrd9.2;	E1 E1,17
40234.56	put amount eurfrgrd5.; put amount eurfrgrd9.2;	E118 E118,03
402345	put amount eurfrgrd5.; put amount eurfrgrd9.2;	1.180 E1.180,30

EURFRHUF*w.d* Format

Converts an amount from Hungarian forints to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRHUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRHUF*w.d* format converts an amount from Hungarian forints to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRHUF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Hungarian forints, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrhuf5.;
   put amount eurfrhuf9.2;
   datalines;
300
30234.56
302345
;
run;
SAS log:
3      put amount eurfrhuf5.;
4      put amount eurfrhuf9.2;
5      datalines;
   E1
    E1,15
 E116
  E116,14
1.161
E1.161,41
```

Amounts	Statements	Results
		----+----1----2

Amounts	Statements	Results
300	put amount eurfrhuf5.;	E1
	put amount eurfrhuf9.2;	E1,15
30234.56	put amount eurfrhuf5.;	E116
	put amount eurfrhuf9.2;	E116,14
302345	put amount eurfrhuf5.;	1.161
	put amount eurfrhuf9.2;	E1.161,41

EURFRIEP*w.d* Format

Converts an amount from Irish pounds to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRIEP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRIEP*w.d* format converts an amount from Irish pounds to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRIEP*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Irish pounds, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfriep5.;
   put amount eurfriep9.2;
   datalines;
1
1234.56
```

```
12345
;
run;
```

```
8       put amount eurfriep5.;
9       put amount eurfriep9.2;
10      datalines;
   E1
    E1.27
1,568
E1,567.57
15675
15,674.92
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurfriep5.;	E1
	put amount eurfriep9.2;	E1.27
1234.56	put amount eurfriep5.;	1,568
	put amount eurfriep9.2;	E1,567.57
12345	put amount eurfriep5.;	15675
	put amount eurfriep9.2;	15,674.92

EURFRITL*w.d* Format

Converts an amount from Italian lire to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRITL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRITL*w.d* format converts an amount from Italian lire to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is

incorporated into the EURFRITL*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Italian lire, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfritl5.;
   put amount eurfritl9.2;
   datalines;
2000
7234.56
72345
;
run;
```

```
8       put amount eurfritl5.;
9       put amount eurfritl9.2;
10      datalines;
   E1
    E1,03
   E4
    E3,74
  E37
   E37,36
```

Amounts	Statements	Results
		----+----1----2
2000	put amount eurfritl5.;	E1
	put amount eurfritl9.2;	E1,03
7234.56	put amount eurfritl5.;	E4
	put amount eurfritl9.2;	E3,74
72345	put amount eurfritl5.;	E37
	put amount eurfritl9.2;	E37,36

EURFRLUF*w.d* Format

Converts an amount from Luxembourg francs to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRLUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRLUF*w.d* format converts an amount from Luxembourg francs to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRLUF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Luxembourg francs, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrluf5.;
   put amount eurfrluf9.2;
   datalines;
50
1234.56
12345
;
run;
```

```
8       put amount eurfrluf5.;
9       put amount eurfrluf9.2;
10      datalines;
   E1
    E1,24
  E31
   E30,60
 E306
  E306,02
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrluf5.;	E1
	put amount eurfrluf9.2;	E1,24

Amounts	Statements	Results
1234.56	put amount eurfrluf5.;	E31
	put amount eurfrluf9.2;	E30,60
12345	put amount eurfrluf5.;	E306
	put amount eurfrluf9.2;	E306,02

EURFRNLG*w.d* Format

Converts an amount from Dutch guilders to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRNLG*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRNLG*w.d* format converts an amount from Dutch guilders to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRNLG*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Dutch guilders, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrnlg5.;
   put amount eurfrnlg9.2;
   datalines;
50
1234.56
12345
;
run;
```

```
8       put amount eurfrnlg5.;
9       put amount eurfrnlg9.2;
10      datalines;
   E23
    E22,69
 E560
  E560,22
5.602
E5.601,92
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrnlg5.; put amount eurfrnlg9.2;	E23 E22,69
1234.56	put amount eurfrnlg5.; put amount eurfrnlg9.2;	E560 E560,22
12345	put amount eurfrnlg5.; put amount eurfrnlg9.2;	5.602 E5.601,92

EURFRNOK*w.d* Format

Converts an amount from Norwegian krone to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRNOK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRNOK*w.d* format converts an amount from Norwegian krone to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRNOK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Norwegian krone, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrnok5.;
   put amount eurfrnok9.2;
   datalines;
50
1234.56
12345
;
run;
SAS log:
3      put amount eurfrnok5.;
4      put amount eurfrnok9.2;
5      datalines;
   E5
    E5,44
 E134
  E134,22
1.342
E1.342,18
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrnok5.; put amount eurfrnok9.2;	E5 E5,44
1234.56	put amount eurfrnok5.; put amount eurfrnok9.2;	E134 E134,22
12345	put amount eurfrnok5.; put amount eurfrnok9.2;	1.342 E1.342,18

EURFRPLZ*w.d* Format

Converts an amount from Polish zloty to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRPLZ*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRPLZ*w.d* format converts an amount from Polish zloty to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRPLZ*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Polish zloty, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrplz5.;
   put amount eurfrplz9.2;
   datalines;
50
1234.56
12345
;
run;
SAS log:
3      put amount eurfrplz5.;
4      put amount eurfrplz9.2;
5      datalines;
  E12
   E11,90
 E294
  E293,94
2.939
E2.939,29
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrplz5.; put amount eurfrplz9.2;	E12 E11,90
1234.56	put amount eurfrplz5.; put amount eurfrplz9.2;	E294 E293,94
12345	put amount eurfrplz5.; put amount eurfrplz9.2;	2.939 E2.939,29

EURFRPTE*w.d* Format

Converts an amount from Portuguese escudos to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRPTE*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRPTE*w.d* format converts an amount from Portuguese escudos to an amount in euros and produces a formatted euro value. The conversion rate is a fixed rate that is incorporated into the EURFRPTE*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Portuguese escudos, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrpte5.;
   put amount eurfrpte9.2;
   datalines;
300
30234.56
302345
;
run;
```

```
8       put amount eurfrpte5.;
9       put amount eurfrpte9.2;
10      datalines;
   E1
    E1,50
 E151
  E150,81
1.508
E1.508,09
```

Amounts	Statements	Results
		----+----1----2
300	put amount eurfrpte5.;	E1
	put amount eurfrpte9.2;	E1,50
30234.56	put amount eurfrpte5.;	E151
	put amount eurfrpte9.2;	E150,81
302345	put amount eurfrpte5.;	1.508
	put amount eurfrpte9.2;	E1.508,09

EURFRROL*w.d* Format

Converts an amount from Romanian lei to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRROL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRROL*w.d* format converts an amount from Romanian lei to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRROL*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in Romanian lei, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrrol5.;
   put amount eurfrrol9.2;
   datalines;
```

```
50
5234.56
52345
;
run;
```

```
   E4
    E3,65
 E382
  E381,81
3.818
E3.818,02
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrrol5.;	E4
	put amount eurfrrol9.2;	E3,65
5234.56	put amount eurfrrol5.;	E382
	put amount eurfrrol9.2;	E381,81
52345	put amount eurfrrol5.;	3.818
	put amount eurfrrol9.2;	E3.818,02

EURFRRUR*w.d* Format

Converts an amount from Russian rubles to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRRUR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRRUR*w.d* format converts an amount from Russian rubles to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRRUR*w.d* format and the EUROCURR function. For

more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Russian rubles, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrrur5.;
   put amount eurfrrur9.2;
   datalines;
50
5234.56
52345
;
run;
```

```
   E3
    E2,53
 E265
  E264,80
2.648
E2.647,97
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrrur5.;	E3
	put amount eurfrrur9.2;	E2,53
5234.56	put amount eurfrrur5.;	E265
	put amount eurfrrur9.2;	E264,80
52345	put amount eurfrrur5.;	2.648
	put amount eurfrrur9.2;	E2.647,97

EURFRSEK*w.d* Format

Converts an amount from Swedish kronor to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRSEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRSEK*w.d* format converts an amount from Swedish kronor to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRSEK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Swedish kronor, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrsek5.;
   put amount eurfrsek9.2;
   datalines;
50
1234.56
12345
;
run;
```

```
   E5
    E5,34
 E132
  E131,81
1.318
E1.318,08
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfrsek5.;	E5
	put amount eurfrsek9.2;	E5,34
1234.56	put amount eurfrsek5.;	E132
	put amount eurfrsek9.2;	E131,81
12345	put amount eurfrsek5.;	1.318
	put amount eurfrsek9.2;	E1.318,08

EURFRSIT*w.d* Format

Converts an amount from Slovenian tolars to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRSIT*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRSIT*w.d* format converts an amount from Slovenian tolars to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRSIT*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Note: Slovenia's currency is the Euro. The information for EURFRSIT is provided for user's historical data.

Example

The following table shows input values in Slovenian tolars, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrsit5.;
   put amount eurfrsit9.2;
   datalines;
200
20234.56
202345
;
run;
```

```
   E1
    E1,05
 E106
  E105,94
1.059
E1.059,40
```

Amounts	Statements	Results
		----+----1----2
200	put amount eurfrsit5.;	E1
	put amount eurfrsit9.2;	E1,05
20234.56	put amount eurfrsit5.;	E106
	put amount eurfrsit9.2;	E105,94
202345	put amount eurfrsit5.;	1.059
	put amount eurfrsit9.2;	E1.059,40

EURFRTRL*w.d* Format

Converts an amount from Turkish liras to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRTRL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRTRL*w.d* format converts an amount from Turkish liras to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRTRL*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62. .

Example

The following table shows input values in Turkish liras, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfrtrl5.;
   put amount eurfrtrl9.2;
   datalines;
```

```
400
40234.56
402345
;
run;
```

```
   E1
    E1,19
 E119
  E119,42
1.194
E1.194,21
```

Amounts	Statements	Results
		----+----1----2
400	put amount eurfrtrl5.;	E1
	put amount eurfrtrl9.2;	E1,19
40234.56	put amount eurfrtrl5.;	E119
	put amount eurfrtrl9.2;	E119,42
402345	put amount eurfrtrl5.;	1.194
	put amount eurfrtrl9.2;	E1.194,21

EURFRYUD*w.d* Format

Converts an amount from Yugoslavian dinars to euros.

Category: Currency Conversion

Alignment: right

Syntax

EURFRYUD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURFRYUD*w.d* format converts an amount from Yugoslavian dinars to an amount in euros and produces a formatted euro value. The conversion rate is a changeable rate that is incorporated into the EURFRYUD*w.d* format and the EUROCURR function. For

more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in Yugoslavian dinars, SAS statements, and the conversion results in euros.

```
data _null_;
   input amount;
   put amount eurfryud5.;
   put amount eurfryud9.2;
   datalines;
50
5234.56
52345
;
run;
```

```
   E4
    E3,83
 E401
  E400,67
4.007
E4.006,69
```

Amounts	Statements	Results
		----+----1----2
50	put amount eurfryud5.;	E4
	put amount eurfryud9.2;	E3,83
5234.56	put amount eurfryud5.;	E401
	put amount eurfryud9.2;	E400,67
52345	put amount eurfryud5.;	4.007
	put amount eurfryud9.2;	E4.006,69

EURTOATS*w.d* Format

Converts an amount from euros to Austrian schillings.

Category: Currency Conversion

Alignment: right

Syntax

EURTOATS*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOATS*w.d* format converts an amount in euros to an amount in Austrian schillings. The conversion rate is a fixed rate that is incorporated into the EURTOATS*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Austrian schillings.

```
data _null_;
   input amount;
   put amount eurtoats6.;
   put amount eurtoats12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
80      put amount eurtoats6.;
81      put amount eurtoats12.2;
82      datalines;
    14
       13.76
 16988
    16987.92
169871
   169870.90
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoats6.;	14
	put amount eurtoats12.2;	13.76
1234.56	put amount eurtoats6.;	16988
	put amount eurtoats12.2;	16987.92
12345	put amount eurtoats6.;	169871
	put amount eurtoats12.2;	169870.90

EURTOBEF*w.d* Format

Converts an amount from euros to Belgian francs.

Category: Currency Conversion

Alignment: right

Syntax

EURTOBEF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOBEF*w.d* format converts an amount in euros to an amount in Belgian francs. The conversion rate is a fixed rate that is incorporated into the EURTOBEF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Belgian francs.

```
data _null_;
   input amount;
   put amount eurtobef6.;
   put amount eurtobef12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
8       put amount eurtobef6.;
9       put amount eurtobef12.2;
10      datalines;
    40
       40.34
 49802
    49802.03
497996
   497996.07
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtobef6.;	40
	put amount eurtobef12.2;	40.34
1234.56	put amount eurtobef6.;	49802
	put amount eurtobef12.2;	49802.03
12345	put amount eurtobef6.;	497996
	put amount eurtobef12.2;	497996.07

EURTOCHF*w.d* Format

Converts an amount from euros to Swiss francs.

Category: Currency Conversion

Alignment: right

Syntax

EURTOCHF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOCHF*w.d* format converts an amount in euros to an amount in Swiss francs. The conversion rate is a changeable rate that is incorporated into the EURTOCHF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Swiss francs.

```
data _null_;
   input amount;
   put amount eurtochf6.;
   put amount eurtochf12.2;
   datalines;
```

```
1
1234.56
12345
;
run;
SAS log:
8       put amount eurtochf6.;
9       put amount eurtochf12.2;
10      datalines;
     2
        1.60
  1981
     1980.60
 19805
    19805.08
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtochf6.; put amount eurtochf12.2;	2 1.60
1234.56	put amount eurtochf6.; put amount eurtochf12.2;	1981 1980.60
12345	put amount eurtochf6.; put amount eurtochf12.2;	19805 19805.08

EURTOCZK*w.d* Format

Converts an amount from euros to Czech koruny.

Category: Currency Conversion

Alignment: right

Syntax

EURTOCZK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOCZK*w.d* format converts an amount in euros to an amount in Czech koruny. The conversion rate is a changeable rate that is incorporated into the EURTOCZK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Czech koruny.

```
data _null_;
   input amount;
   put amount eurtoczk6.;
   put amount eurtoczk12.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
104     put amount eurtoczk6.;
105     put amount eurtoczk12.2;
106     datalines;
    35
       34.86
 43032
    43032.19
430301
   430301.02
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoczk6.;	35
	put amount eurtoczk12.2;	34.86
1234.56	put amount eurtoczk6.;	43032
	put amount eurtoczk12.2;	43032.19
12345	put amount eurtoczk6.;	430301
	put amount eurtoczk12.2;	430301.02

EURTODEM*w.d* Format

Converts an amount from euros to Deutsche marks.

Category: Currency Conversion

Alignment: right

Syntax

EURTODEM*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTODEM*w.d* format converts an amount in euros to an amount in Deutsche marks. The conversion rate is a fixed rate that is incorporated into the EURTODEM*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Deutsche marks.

```
data _null_;
   input amount;
   put amount eurtodem6.;
   put amount eurtodem12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
8       put amount eurtodem6.;
9       put amount eurtodem12.2;
10      datalines;
     2
        1.96
  2415
     2414.59
 24145
    24144.72
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtodem6.; put amount eurtodem12.2;	2 1.96

Amounts	Statements	Results
1234.56	put amount eurtodem6.;	2415
	put amount eurtodem12.2;	2414.59
12345	put amount eurtodem6.;	24145
	put amount eurtodem12.2;	24144.72

EURTODKK*w.d* Format

Converts an amount from euros to Danish kroner.

Category: Currency Conversion

Alignment: right

Syntax

EURTODKK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTODKK*w.d* format converts an amount in euros to an amount in Danish kroner. The conversion rate is a changeable rate that is incorporated into the EURTODKK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Danish kroner.

```
data _null_;
   input amount;
   put amount eurtodkk6.;
   put amount eurtodkk12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
SAS log:
62      put amount eurtodkk6.;
63      put amount eurtodkk12.2;
64      datalines;
     7
        7.49
  9247
     9246.97
 92465
    92465.16
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtodkk6.;	7
	put amount eurtodkk12.2;	7.49
1234.56	put amount eurtodkk6.;	9247
	put amount eurtodkk12.2;	9246.97
12345	put amount eurtodkk6.;	92465
	put amount eurtodkk12.2;	92465.16

EURTOESP*w.d* Format

Converts an amount from euros to Spanish peseta.

Category: Currency Conversion

Alignment: right

Syntax

EURTOESP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOESP*w.d* format converts an amount in euros to an amount in Spanish peseta. The conversion rate is a fixed rate that is incorporated into the EURTOESP*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Spanish peseta.

```
data _null_;
   input amount;
   put amount eurtoesp8.;
   put amount eurtoesp12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
26      put amount eurtoesp8.;
27      put amount eurtoesp12.2;
28      datalines;
     166
      166.39
  205414
   205413.50
 2054035
  2054035.17
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoesp8.; `put amount eurtoesp12.2;`	166 `166.39`
1234.56	put amount eurtoesp8.; put amount eurtoesp12.2;	205414 205413.50
12345	put amount eurtoesp8.; put amount eurtoesp12.2;	2054035 2054035.17

EURTOFIM*w.d* Format

Converts an amount from euros to Finnish markkas.

Category: Currency Conversion

Alignment: right

Syntax

EURTOFIM*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOFIM*w.d* format converts an amount in euros to an amount in Finnish markkas. The conversion rate is a fixed rate that is incorporated into the EURTOFIM*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Finnish markkas.

```
data _null_;
   input amount;
   put amount eurtofim6.;
   put amount eurtofim12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
8       put amount eurtofim6.;
9       put amount eurtofim12.2;
10      datalines;
     6
        5.95
  7340
     7340.36
 73400
    73400.04
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtofim6.;	6
	put amount eurtofim12.2;	5.95
1234.56	put amount eurtofim6.;	7340
	put amount eurtofim12.2;	7340.36
12345	put amount eurtofim6.;	73400
	put amount eurtofim12.2;	73400.04

EURTOFRF*w.d* Format

Converts an amount from euros to French francs.

Category: Currency Conversion

Alignment: right

Syntax

EURTOFRF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOFRF*w.d* format converts an amount in euros to an amount in French francs. The conversion rate is a fixed rate that is incorporated into the EURTOFRF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in French francs.

```
data _null_;
   input amount;
   put amount eurtofrf6.;
   put amount eurtofrf12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
8       put amount eurtofrf6.;
9       put amount eurtofrf12.2;
10      datalines;
     7
        6.56
  8098
     8098.18
 80978
    80977.89
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtofrf6.;	7
	put amount eurtofrf12.2;	6.56
1234.56	put amount eurtofrf6.;	8098
	put amount eurtofrf12.2;	8098.18
12345	put amount eurtofrf6.;	80978
	put amount eurtofrf12.2;	80977.89

EURTOGBP*w.d* Format

Converts an amount from euros to British pounds.

Category: Currency Conversion

Alignment: right

Syntax

EURTOGBP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOGBP*w.d* format converts an amount in euros to an amount in British pounds. The conversion rate is a changeable rate that is incorporated into the EURTOGBP*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in British pounds.

```
data _null_;
   input amount;
   put amount eurtogbp6.;
   put amount eurtogbp12.2;
   datalines;
```

```
1
1234.56
12345
;
run;
SAS log:
8       put amount eurtogbp6.;
9       put amount eurtogbp12.2;
10      datalines;
     1
        0.70
   864
      864.35
  8643
     8643.13
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtogbp6.;	1
	put amount eurtogbp12.2;	0.70
1234.56	put amount eurtogbp6.;	864
	put amount eurtogbp12.2;	864.35
12345	put amount eurtogbp6.;	8643
	put amount eurtogbp12.2;	8643.13

EURTOGRD*w.d* Format

Converts an amount from euros to Greek drachmas.

Category: Currency Conversion

Alignment: right

Syntax

EURTOGRD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOGRD*w.d* format converts an amount in euros to an amount in Greek drachmas. The conversion rate is a fixed rate that is incorporated into the EURTOGRD*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Greek drachmas.

```
data _null_;
   input amount;
   put amount eurtogrd8.;
   put amount eurtogrd16.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
65      put amount eurtogrd8.;
66      put amount eurtogrd16.2;
67      datalines;
     341
          340.89
  420843
       420842.99
 4208225
      4208225.33
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtogrd8.;	341
	put amount eurtogrd16.2;	340.89
1234.56	put amount eurtogrd8.;	420843
	put amount eurtogrd16.2;	420842.99
12345	put amount eurtogrd8.;	4208225
	put amount eurtogrd16.2;	4208225.33

EURTOHUF*w.d* Format

Converts an amount from euros to Hungarian forints.

Category: Currency Conversion

Alignment: right

Syntax

EURTOHUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOHUF*w.d* format converts an amount in euros to an amount in Hungarian forints. The conversion rate is a changeable rate that is incorporated into the EURTOHUF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Hungarian forints.

```
data _null_;
   input amount;
   put amount eurtohuf8.;
   put amount eurtohuf14.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
140     put amount eurtohuf8.;
141     put amount eurtohuf14.2;
142     datalines;
     260
        260.33
  321387
     321386.83
 3213712
    3213712.13
```

Amounts	Statements	Results
		`----+----1----2`

Amounts	Statements	Results
1	put amount eurtohuf8.;	260
	put amount eurtohuf14.2;	260.33
1234.56	put amount eurtohuf8.;	321387
	put amount eurtohuf14.2;	321386.83
12345	put amount eurtohuf8.;	3213712
	put amount eurtohuf14.2;	3213712.13

EURTOIEP*w.d* Format

Converts an amount from euros to Irish pounds.

Category: Currency Conversion

Alignment: right

Syntax

EURTOIEP*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOIEP*w.d* format converts an amount in euros to an amount in Irish pounds. The conversion rate is a fixed rate that is incorporated into the EURTOIEP*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Irish pounds.

```
data _null_;
   input amount;
   put amount eurtoiep6.;
   put amount eurtoiep12.2;
   datalines;
1
1234.56
```

```
12345
;
run;
```

```
8       put amount eurtoiep6.;
9       put amount eurtoiep12.2;
10      datalines;
     1
        0.79
   972
      972.30
  9722
     9722.48
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoiep6.;	1
	put amount eurtoiep12.2;	0.79
1234.56	put amount eurtoiep6.;	972
	put amount eurtoiep12.2;	972.30
12345	put amount eurtoiep6.;	9722
	put amount eurtoiep12.2;	9722.48

EURTOITL*w.d* Format

Converts an amount from euros to Italian lire.

Category: Currency Conversion

Alignment: right

Syntax

EURTOITL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOITL*w.d* format converts an amount in euros to an amount in Italian lire. The conversion rate is a fixed rate that is incorporated into the EURTOITL*w.d* format and the

EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62. .

Example

The following table shows input values in euros, SAS statements, and the conversion results in Italian lire.

```
data _null_;
   input amount;
   put amount eurtoitl8.;
   put amount eurtoitl12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
44      put amount eurtoitl8.;
45      put amount eurtoitl12.2;
46      datalines;
    1936
     1936.27
 2390441
  2390441.49
23903253
 23903253.15
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoitl8.; put amount eurtoitl12.2;	1936 1936.27
1234.56	put amount eurtoitl8.; put amount eurtoitl12.2;	2390441 2390441.49
12345	put amount eurtoitl8.; put amount eurtoitl12.2;	23903253 23903253.15

EURTOLUF*w.d* Format

Converts an amount from euros to Luxembourg francs.

Category: Currency Conversion

Alignment: right

Syntax

EURTOLUF*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOLUF*w.d* format converts an amount in euros to an amount in Luxembourg francs. The conversion rate is a fixed rate that is incorporated into the EURTOLUF*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Luxembourg francs.

```
data _null_;
   input amount;
   put amount eurtoluf6.;
   put amount eurtoluf12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
8       put amount eurtoluf6.;
9       put amount eurtoluf12.2;
10      datalines;
    40
       40.34
 49802
    49802.03
497996
   497996.07
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoluf6.;	40
	put amount eurtoluf12.2;	40.34

Amounts	Statements	Results
1234.56	put amount eurtoluf6.;	49802
	put amount eurtoluf12.2;	49802.03
12345	put amount eurtoluf6.;	497996
	put amount eurtoluf12.2;	497996.07

EURTONLG*w.d* Format

Converts an amount from euros to Dutch guilders.

Category: Currency Conversion

Alignment: right

Syntax

EURTONLG*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTONLG*w.d* format converts an amount in euros to an amount in Dutch guilders. The conversion rate is a fixed rate that is incorporated into the EURTONLG*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Dutch guilders.

```
data _null_;
   input amount;
   put amount eurtonlg6.;
   put amount eurtonlg12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
8       put amount eurtonlg6.;
9       put amount eurtonlg12.2;
10      datalines;
     2
        2.20
  2721
     2720.61
 27205
    27204.80
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtonlg6.; put amount eurtonlg12.2;	2 2.20
1234.56	put amount eurtonlg6.; put amount eurtonlg12.2;	2721 2720.61
12345	put amount eurtonlg6.; put amount eurtonlg12.2;	27205 27204.80

EURTONOK*w.d* Format

Converts an amount from euros to Norwegian krone.

Category: Currency Conversion

Alignment: right

Syntax

EURTONOK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTONOK*w.d* format converts an amount in euros to an amount in Norwegian krone. The conversion rate is a changeable rate that is incorporated into the EURTONOK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see “Currency Representation” on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Norwegian krone.

```
data _null_;
   input amount;
   put amount eurtonok6.;
   put amount eurtonok12.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
158     put amount eurtonok6.;
159     put amount eurtonok12.2;
160     datalines;
     9
        9.20
 11355
    11355.11
113546
   113545.61
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtonok6.;	9
	put amount eurtonok12.2;	9.20
1234.56	put amount eurtonok6.;	11355
	put amount eurtonok12.2;	11355.11
12345	put amount eurtonok6.;	113546
	put amount eurtonok12.2;	113545.61

EURTOPLZ*w.d* Format

Converts an amount from euros to Polish zloty.

Category: Currency Conversion

Alignment: right

Syntax

EURTOPLZ*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOPLZ*w.d* format converts an amount in euros to an amount in Polish zloty. The conversion rate is a changeable rate that is incorporated into the EURTOPLZ*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Polish zloty.

```
data _null_;
   input amount;
   put amount eurtoplz6.;
   put amount eurtoplz12.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
80      put amount eurtoplz6.;
81      put amount eurtoplz12.2;
82      datalines;
     4
        4.20
  5185
     5185.15
 51849
    51849.00
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtoplz6.;	4
	put amount eurtoplz12.2;	4.20
1234.56	put amount eurtoplz6.;	5185
	put amount eurtoplz12.2;	5185.15
12345	put amount eurtoplz6.;	51849
	put amount eurtoplz12.2;	51849.00

EURTOPTE*w.d* Format

Converts an amount from euros to Portuguese escudos.

Category: Currency Conversion

Alignment: right

Syntax

EURTOPTE*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOPTE*w.d* format converts an amount in euros to an amount in Portuguese escudos. The conversion rate is a fixed rate that is incorporated into the EURTOPTE*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Portuguese escudos.

```
data _null_;
   input amount;
   put amount eurtopte8.;
   put amount eurtopte12.2;
   datalines;
1
1234.56
12345
;
run;
```

```
26      put amount eurtopte8.;
27      put amount eurtopte12.2;
28      datalines;
     200
      200.48
  247507
   247507.06
 2474950
  2474950.29
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtopte8.;	200
	put amount eurtopte12.2;	200.48
1234.56	put amount eurtopte8.;	247507
	put amount eurtopte12.2;	247507.06
12345	put amount eurtopte8.;	2474950
	put amount eurtopte12.2;	2474950.29

EURTOROL*w.d* Format

Converts an amount from euros to Romanian lei.

Category: Currency Conversion

Alignment: right

Syntax

EURTOROL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOROL*w.d* format converts an amount in euros to an amount in Romanian lei. The conversion rate is a changeable rate that is incorporated into the EURTOROL*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Romanian lei.

```
data _null_;
   input amount;
   put amount eurtorol6.;
   put amount eurtorol12.2;
   datalines;
```

```
1
1234.56
12345
;
run;
SAS log:
98      put amount eurtorol6.;
99      put amount eurtorol12.2;
100     datalines;
      14
       13.71
   16926
    16925.82
  169250
   169249.95
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtorol6.;	14
	put amount eurtorol12.2;	13.71
1234.56	put amount eurtorol6.;	16926
	put amount eurtorol12.2;	16925.82
12345	put amount eurtorol6.;	169250
	put amount eurtorol12.2;	169249.95

EURTORUR*w.d* Format

Converts an amount from euros to Russian rubles.

Category: Currency Conversion

Alignment: right

Syntax

EURTORUR*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTORUR*w.d* format converts an amount in euros to an amount in Russian rubles. The conversion rate is a changeable rate that is incorporated into the EURTORUR*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Russian rubles.

```
data _null_;
   input amount;
   put amount eurtorur6.;
   put amount eurtorur12.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
8       put amount eurtorur6.;
9       put amount eurtorur12.2;
10      datalines;
    20
       19.77
 24405
    24404.78
244036
   244035.96
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtorur6.; put amount eurtorur12.2;	20 19.77
1234.56	put amount eurtorur6.; put amount eurtorur12.2;	24405 24404.78
12345	put amount eurtorur6.; put amount eurtorur12.2;	244036 244035.96

EURTOSEK*w.d* Format

Converts an amount from euros to Swedish kronor.

Category: Currency Conversion

Alignment: right

Syntax

EURTOSEK*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOSEK*w.d* format converts an amount in euros to an amount in Swedish kronor. The conversion rate is a changeable rate that is incorporated into the EURTOSEK*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Swedish kronor.

```
data _null_;
   input amount;
   put amount eurtosek6.;
   put amount eurtosek12.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
86      put amount eurtosek6.;
87      put amount eurtosek12.2;
88      datalines;
     9
        9.37
 11563
    11562.78
115622
   115622.16
```

Amounts	Statements	Results
		----+----1----2

Amounts	Statements	Results
1	put amount eurtosek6.;	9
	put amount eurtosek12.2;	9.37
1234.56	put amount eurtosek6.;	11563
	put amount eurtosek12.2;	11562.78
12345	put amount eurtosek6.;	115622
	put amount eurtosek12.2;	115622.16

EURTOSIT*w.d* Format

Converts an amount from euros to Slovenian tolars.

Category: Currency Conversion

Alignment: right

Syntax

EURTOSIT*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOSIT*w.d* format converts an amount in euros to an amount in Slovenian tolars. The conversion rate is a changeable rate that is incorporated into the EURTOSIT*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Note: Slovenia's currency is the Euro. The information for EURTOSIT is provided for user's historical data.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Slovenian tolars.

```
data _null_;
   input amount;
   put amount eurtosit8.;
   put amount eurtosit14.2;
```

```
   datalines;
1
1234.56
12345
;
run;
SAS log:
152     put amount eurtosit8.;
153     put amount eurtosit14.2;
154     datalines;
     191
        191.00
  235801
     235800.96
 2357895
    2357895.00
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtosit8.;	191
	put amount eurtosit14.2;	191.00
1234.56	put amount eurtosit8.;	235801
	put amount eurtosit14.2;	235800.96
12345	put amount eurtosit8.;	2357895
	put amount eurtosit14.2;	2357895.00

EURTOTRL*w.d* Format

Converts an amount from euros to Turkish liras.

Category: Currency Conversion

Alignment: right

Syntax

EURTOTRL*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOTRL*w.d* format converts an amount in euros to an amount in Turkish liras. The conversion rate is a changeable rate that is incorporated into the EURTOTRL*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Turkish liras.

```
data _null_;
   input amount;
   put amount eurtotrl8.;
   put amount eurtotrl14.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
62      put amount eurtotrl8.;
63      put amount eurtotrl14.2;
64      datalines;
     337
         336.91
  415938
     415938.08
 4159179
    4159178.64
```

Amounts	Statements	Results
		----+----1----2
1	put amount eurtotrl8.;	337
	put amount eurtotrl14.2;	336.91
1234.56	put amount eurtotrl8.;	415938
	put amount eurtotrl14.2;	415938.08
12345	put amount eurtotrl8.;	4159179
	put amount eurtotrl14.2;	4159178.64

EURTOYUD*w.d* Format

Converts an amount from euros to Yugoslavian dinars.

Category: Currency Conversion

Alignment: right

Syntax

EURTOYUD*w.d*

Syntax Description

w

specifies the width of the output field.

Default: 6

d

specifies the number of digits to the right of the decimal point in the numeric value.

Details

The EURTOYUD*w.d* format converts an amount in euros to an amount in Yugoslavian dinars. The conversion rate is a changeable rate that is incorporated into the EURTOYUD*w.d* format and the EUROCURR function. For more information about European currency conversion and currency conversion rate tables, see "Currency Representation" on page 62.

Example

The following table shows input values in euros, SAS statements, and the conversion results in Yugoslavian dinars.

```
data _null_;
   input amount;
   put amount eurtoyud6.;
   put amount eurtoyud12.2;
   datalines;
1
1234.56
12345
;
run;
SAS log:
116     put amount eurtoyud6.;
117     put amount eurtoyud12.2;
118     datalines;
    13
       13.06
 16129
    16128.79
161280
   161280.02
```

Amounts	Statements	Results
		----+----1----2

Amounts	Statements	Results
1	put amount eurtoyud6.;	13
	put amount eurtoyud12.2;	13.06
1234.56	put amount eurtoyud6.;	16129
	put amount eurtoyud12.2;	16128.79
12345	put amount eurtoyud6.;	161280
	put amount eurtoyud12.2;	161280.02

EURDFDE*w*. Informat

Reads international date values.

Category: Date and Time

Syntax

EURDFDE*w*.

Required Argument

w

specifies the width of the input field.

Default: 7 (except Finnish)

Range: 7–32 (except Finnish)

Note: If you use the Finnish (FIN) language prefix, the *w* range is 10–32 and the default *w* is 10.

Details

The date values must be in the form *ddmmmyy* or *ddmmmyyyy*:

dd
is an integer from 01–31 that represents the day of the month.

mmm
is the first three letters of the month name.

yy or *yyyy*
is a two-digit or four-digit integer that represents the year.

You can place blanks and other special characters between day, month, and year values.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes . When you specify the language prefix in the informat, SAS ignores the DFLANG= system option.

Example

This INPUT statement uses the value of the DFLANG= system option to read the international date values in Spanish.

```
options dflang=spanish;
input day eurdfde10.;
```

This INPUT statement uses the Spanish language prefix in the informat to read the international date values in Spanish. The value of the DFLANG= option, therefore, is ignored.

```
input day espdfde10.;
```

```
options dflang=spanish;
data _null_;
input day eurdfde10.;
 put day;
datalines;
01abr1999
01-abr-99
;
```

Values	Results
	----+----1
01abr1999	14335
01-abr-99	14335

EURDFDT*w*. Informat

Reads international datetime values in the form *ddmmmyy hh:mm:ss.ss* or *ddmmmyyyy hh:mm:ss.ss*.

Category: Date and Time

Syntax

EURDFDT*w*.

Syntax Description

w
specifies the width of the input field.

Default: 18

Range: 13–40

Details

The date values must be in the form *ddmmmyy* or *ddmmmyyyy*, followed by a blank or special character, and then the time values as *hh:mm:ss.ss*. The syntax for the date is represented as follows:

dd
is an integer from 01–31 that represents the day of the month.

mmm
is the first three letters of the month name.

yy or *yyyy*
is a two-digit or four-digit integer that represents the year.

The syntax for time is represented as follows:

hh
is the number of hours ranging from 00–23,

mm
is the number of minutes ranging from 00–59,

ss.ss
is the number of seconds ranging from 00–59 with the fraction of a second following the decimal point.

The EURDFDT*w*. informat requires values for both the date and the time. However, the *ss.ss* portion is optional.

Note: SAS interprets a two-digit year as belonging to the 100-year span that is defined by the YEARCUTOFF= system option.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes. When you specify the language prefix in the informat, SAS ignores the DFLANG= system option.

Example

This INPUT statement uses the value of the DFLANG= system option to read the international datetime values in German.

```
options dflang=german;
input date eurdfdt20.;
```

This INPUT statement uses the German language prefix to read the international datetime values in German. The value of the DFLANG= option, therefore, is ignored.

```
input date deudfdt20.;
```

```
options dflang=german;
data _null_;
input date eurdfdt20.;
 put date;
datalines;
23dez99:10:03:17.2
23dez1999:10:03:17.2
;
```

Values	Results
	`----+----1----+----2`
`23dez99:10:03:17.2`	`1261562597.2`

Values	Results
23dez1999:10:03:17.2	1261562597.2

EURDFMY*w*. Informat

Reads month and year date values in the form *mmmyy* or *mmmyyyy*.

Category: Date and Time

Syntax

EURDFMY*w*.

Syntax Description

w
specifies the width of the input field.

Default: 5 (except Finnish)

Range: 5–32 (except Finnish)

Note: If you use the Finnish (FIN) language prefix, the *w* range is 7–32 and the default value for *w* is 7.

Details

The date values must be in the form *mmmyy* or *mmmyyyy*:

mmm
is the first three letters of the month name.

yy or *yyyy*
is a two-digit or four-digit integer that represents the year.

You can place blanks and other special characters between day, month, and year values. A value that is read with EURDFMY*w*. results in a SAS date value that corresponds to the first day of the specified month.

Note: SAS interprets a two-digit year as belonging to the 100-year span that is defined by the YEARCUTOFF= system option.

You can set the language for the SAS session with the DFLANG= system option. (Because the SAS Installation Representative usually sets a default language for the site, you might be able to skip this step.) If you work with dates in multiple languages, you can replace the EUR prefix with a language prefix. See "DFLANG= System Option: UNIX, Windows, and z/OS" on page 474 for the list of language prefixes . When you specify the language prefix in the informat, SAS ignores the DFLANG= option.

Example

This INPUT statement uses the value of DFLANG= system option to read the international date values in French.

```
options dflang=french;
input month eurdfmy7.;
```

The second INPUT statement uses the French language prefix, and DFLANG is not specified.

```
input month fradfmy7.;
```

```
options dflang=french;
data _null_;
 input month eurdfmy7.;
  put month;
 datalines;
avr1999
avr 99
 ;
 options dflang=english;
data _null_;
 input month fradfmy7.;
  put month;
 datalines;
avr1999
avr 99
 ;
```

Values	Results
	----+----1
avr1999	14335
avr 99	14335

EUROCURR Function

Converts one European currency to another.

Category: Currency Conversion

Syntax

EUROCURR(*from-currency-amount*, *from-currency-code*, *to-currency-code*)

Required Arguments

from-currency-amount
is a numeric value that specifies the amount to convert.

from-currency-code
specifies a three-character currency code that identifies the currency that you are converting from. (See European Currency and Currency Codes on page 681 .)

Tip: If *from-currency-code* has a blank value, EUROCURR converts currency values from euros to the currency of the European country that you specify.

See: "Example 4: Converting Currency When One Variable Is Blank" on page 683

to-currency-code

specifies a three-character currency code that identifies the currency that you are converting to. (See European Currency and Currency Codes on page 681 .)

Tip: If *to-currency-code* has a blank value, EUROCURR converts values from the currency of the European country that you specify to euros.

Details

The following table lists European currencies and the associated currency codes. Use the currency codes to identify the type of currency that you are converting to or converting from. Several countries use the Euro as their currency instead of the currency listed in the following table. This information is provided in order to satisfy user's historical data.buildnlsOTKEY

Table A1.1 *European Currency and Currency Codes*

Currency	Currency code
Austrian schilling	ATS
Belgian franc	BEF
British pound sterling	GBP
Czech koruna	CZK
Danish krone	DKK
Deutsche mark	DEM
Dutch guilder	NLG
Euro	EUR
Finnish markka	FIM
French franc	FRF
Greek drachma	GRD
Hungarian forint	HUF
Irish pound	IEP
Italian lira	ITL
Luxembourg franc	LUF
Norwegian krone	NOK
Polish zloty	PLZ
Portuguese escudo	PTE

Currency	Currency code
Romanian leu	ROL
Russian ruble	RUR
Slovenian tolar	SIT
Spanish peseta	ESP
Swedish krona	SEK
Swiss franc	CHF
Turkish lira	TRL
Yugoslavian dinar	YUD

The EUROCURR function converts a specific country's currency to an equivalent amount in another country's currency. It can also convert a specific country's currency to euros. EUROCURR uses the values in either the fixed currency conversion rate table or the changeable currency conversion rate table to convert currency.

If you are converting from one country's currency to euros, SAS divides by that*from-currency-amount* country's rate from one of the conversion rate tables. See “Example 1: Converting from Deutsche Marks to Euros” on page 682 . If you are converting from euros to a country's currency, SAS multiplies by that*from-currency-amount* country's rate from one of the conversion rate tables. See “Example 2: Converting from Euros to Deutsche Marks” on page 682 . If you are converting one country's currency to another country's currency, SAS first converts the *from-currency-amount* to euros. SAS stores the intermediate value in as much precision as your operating environment allows, and does not round the value. SAS then converts the amount in euros to an amount in the currency that you are converting to. See “Example 3: Converting from French Francs to Deutsche Marks” on page 683 .

Examples

Example 1: Converting from Deutsche Marks to Euros

The following example converts one Deutsche mark to an equivalent amount of euros.

```
data _null_;
   amount=eurocurr(50,'dem','eur');
   put amount= ;
run;
```

The value in the SAS log is: **amount=25.56459406**.

Example 2: Converting from Euros to Deutsche Marks

The following example converts one euro to an equivalent amount of Deutsche marks.

```
data _null_;
   amount=eurocurr(25,'eur','dem');
   put amount= ;
run;
```

The value in the SAS log is: **amount=48.89575**.

Example 3: Converting from French Francs to Deutsche Marks

The following example converts 50 French francs to an equivalent amount of Deutsche marks.

```
data _null_;
   x=50;
   amount=eurocurr(x,'frf','dem');
   put amount=;
run;
```

The value in the SAS log is: **amount=14.908218069**.

Example 4: Converting Currency When One Variable Is Blank

The following example converts 50 euros to Deutsche marks.

```
data _null_;
   x=50;
   amount=eurocurr(x,' ','dem');
   put amount=;
run;
```

The value in the SAS log is: **amount=97.7915**.

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