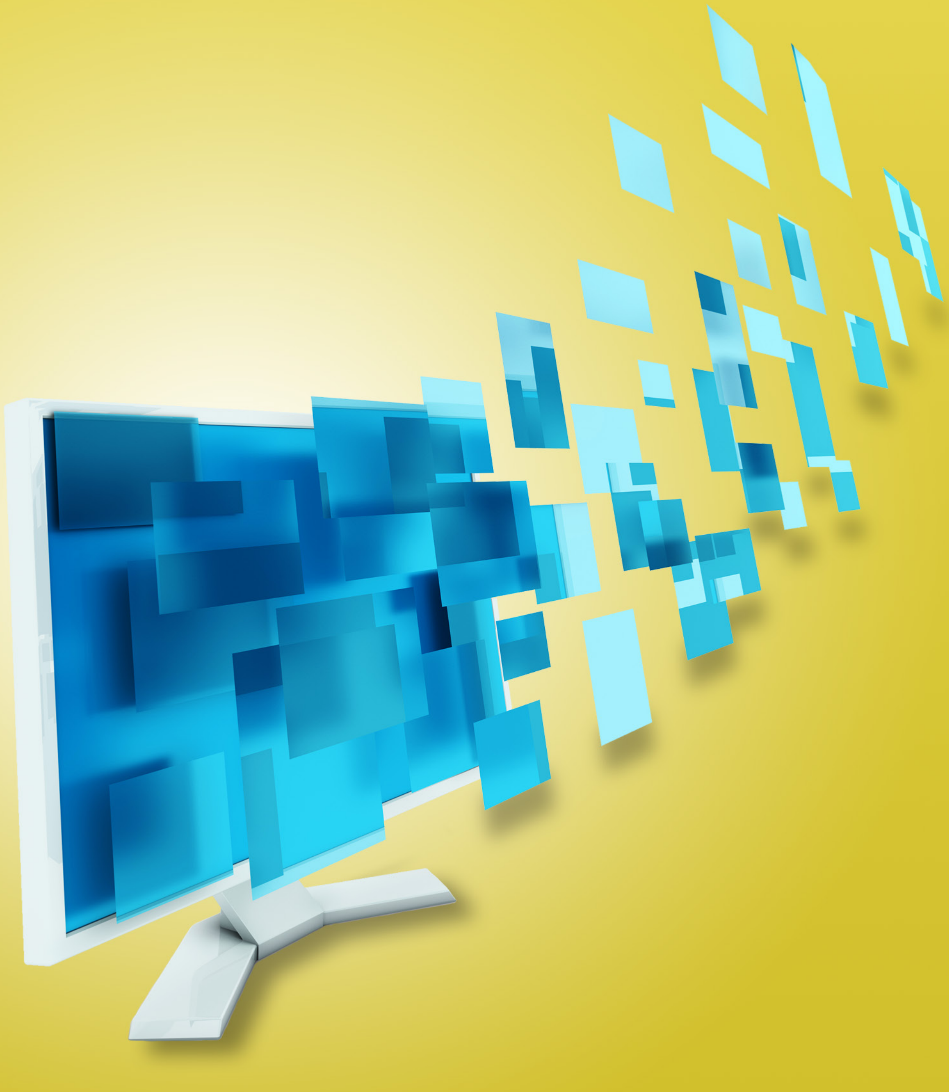
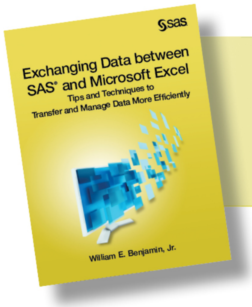
Exchanging Data between SAS® and Microsoft Excel

Tips and Techniques to Transfer and Manage Data More Efficiently



William E. Benjamin, Jr.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Exchanging Data between SAS® and Microsoft Excel
Tips and Techniques to Transfer and Manage Data More Efficiently
William E. Benjamin, Jr.

From *Exchanging Data Between SAS® and Microsoft Excel*. Full book available for purchase here.

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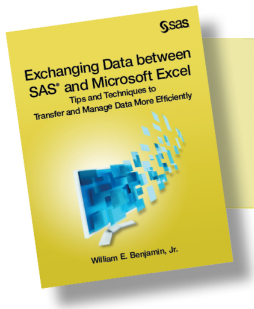

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Chapter 3: Use PROC IMPORT to Read External Data Files and Excel Workbooks into SAS

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3.1 Introduction

This chapter builds upon the Chapter 1 explanation and examples of the SAS Import Wizard, and will explain the syntax, usage, and the results that can be generated when using the SAS IMPORT procedure, specifically PROC IMPORT.

PROC IMPORT is a general purpose routine and is able to read data from text files and Excel workbook files which can exist in several different formats. The ability to read files of many formats makes PROC IMPORT extremely useful. The primary focus of this chapter will be upon reading Excel files. However, some examples will show how to read text files with delimiters because Excel can write files with those formats. The syntax of PROC IMPORT will be explained and the options listed below in Table 3.3.1. One important aspect of PROC IMPORT is its ability to interface with an external Data Base Management System (DBMS). PROC IMPORT has a syntax argument called DBMS that makes this option available and permits access to many different input data formats. Options exist to enable the transfer of data between SAS and many other file formats, but because the focus of this work is moving data from SAS to Excel and back, only options relative to Excel will be explored.

Depending upon which operating system and version of SAS you are using, you may be able to read some or all of the following formats. The details for reading these other formats are explained in the SAS documentation.

- Microsoft Access database files
- Microsoft Excel workbook files
- Lotus 1-2-3 spreadsheet files
- Paradox files
- SPSS files
- Stata files
- dBase files

- JMP files
- delimited files

3.2 Purpose

I will discuss the syntax of the SAS IMPORT procedure and point you to the SAS online documentation for your version of SAS in this chapter. There will be several examples to show you how to write the code to use PROC IMPORT and the results that the examples produce. Because not everyone has the latest version of either SAS or Excel installed on his or her computer, I will not restrict my examples to those newest versions. This chapter will show you how to write SAS code to use PROC IMPORT. Because of the size and complexity of some of the reference tables I suggest that you refer to *SAS/ACCESS Interface to PC Files: Reference* for the version of SAS that you have installed.

3.3 Syntax of the SAS IMPORT Procedure

PROC IMPORT

DATAFILE= <*'filename'*> | DATATABLE= <*'tablename'*> (Not used for Microsoft Excel files)
<DBMS>= <*data-source-identifier*>
<OUT>= <*libref.SAS data-set-name*> <*SAS data-set-option(s)*>
<REPLACE>;
<*file-format-specific-statements*>;

NOTE: Some features relating to Microsoft Excel 2007, 2010, and 2013 for operating systems Microsoft Vista 64 bit, Microsoft Windows 7 and 8, LINUX, and UNIX, may not be available in SAS versions prior to the third maintenance release of SAS 9.2. Other operating systems may not be compatible until later versions of SAS are released. SAS is not supported on some versions of the Microsoft Windows operating system.

Table 3.3.1 provides a high-level definition of the parts of the syntax for PROC IMPORT as listed above. See SAS/ACCESS to PC Files: Reference for more details about PROC EXPORT in the SAS software version you are using.

Table 3.3.1: General Description of PROC IMPORT Syntax Options.

Argument / (Alias)	Required	Definition of the Function of the Argument
OUTFILE/(FILE)	Yes	Provide the output file name. DATATABLE is not used for Excel files.
SAS Data Set Options	No	Options like KEEP=, DROP=, RENAME=, WHERE=, and others may be provided.
OUT=	Yes	Provide the output SAS dataset name.
DBMS	No	See Tables below for specific options relating to the individual DBMS <identifier> values. Options are based upon the file types being processed and direct the actions of the SAS PROC IMPORT features.
REPLACE	No	When “REPLACE” is present then SAS will overwrite an existing output file. A new file will be created if the requested file name does not exist.

3.4 Data Access Methods for Excel Files Supported by PROC IMPORT

The data access methods listed in Figure 3.4.1 are used to read data files Excel has the ability to create. Selecting a DBMS mode determines which utility will be used to process the external file to create an output SAS dataset. The input file may be a text file or an Excel spreadsheet. See the documents listed above for more details about the SAS software version you are using. Some of these data access methods (the DBMS=modes) require SAS/ACCESS Interface to PC Files software to function. You must have SAS/ACCESS Interface to PC Files licensed before you can import files directly from some versions Microsoft Excel workbooks. Some features relating to Microsoft Excel 2007, Excel 2010, and Excel 2013 when using Microsoft Windows, LINUX, and UNIX operating systems may not be available in SAS versions prior to the third maintenance release of SAS 9.2. Because the number of SAS, Excel, and operating system versions is large, I once again refer you to the SAS documentation to help you figure out what you have installed.

If you suspect that your SAS and Excel software may have different bit configurations (32 or 64 bit), contact your IT Department.

The DBMS identifiers listed in Table 3.4.1 are relative to the file formats that Microsoft Excel can read or write. The SAS documentation lists other DBMS identifiers that the PROC IMPORT can read. See the SAS documentation for your version of SAS for other options to read file formats available. Different versions of SAS may not be able to read to all of the versions of Excel.

Table 3.4.1: DBMS Formats Available for Input.

DBMS Identifier	SAS/ACCESS Interface to PC Files Required	General Description of the DBMS Output File
CSV	N	Text file with a comma delimiter
TAB	N	Text file with a tab delimiter
DLM	N	Text file with a user-defined delimiter
EXCEL	Y	Excel workbook (2003 xls – 2013 xlsx)
EXCELCS	Y	Excel workbook (2003 xls – 2007 xlsx) using the SAS PC Files Server
EXCEL4	Y	Excel workbook using PROC DBLOAD
EXCEL5	Y	Excel workbook using PROC DBLOAD
XLS	Y	Excel workbook using file formats prior to Excel 2007 except Excel 4 and Excel 5
XLSX	Y	Excel workbook using file formats 2007, 2010, and 2013

Table 3.4.2 lists some information about the input methods available when reading Excel worksheets. Some of these methods have limitations that are smaller than the full capabilities of the Excel version that created them. These restrictions are as a result of using the Microsoft JET or ACE engines to access the Excel workbooks.

Table 3.4.2: DBMS Input Methods of Accessing Excel Files.

Utility	DBMS Model	Excel Version	Comments
EXCEL	LIBNAME statement	5, 95, 97, 2000, 2002, 2003, 2007, 2010, 2013	This DBMS option will use the LIBNAME statement. Depending upon your version of SAS and Excel, access may be limited to the first 65,535 rows and 255 columns.
EXCELCS	SAS PC Files Server	5, 95, 97, 2000, 2002, 2003, 2007, 2010, 2013	This DBMS option will use the SAS PC Files Server. Depending upon your version of SAS and Excel, access may be limited to the first 65,535 rows and 255 columns.

Utility	DBMS Model	Excel Version	Comments
EXCEL4 or EXCEL5	DBLOAD procedure	4, 5, 95	This is supported only on the Microsoft Windows operating systems and is for SAS 6 compatibility.
XLS	XLS format	97, 2000, 2002, 2003	Some versions of SAS may not support the Chinese, Japanese, or Korean DBCS character sets.
XLSX	XLSX format	2007, 2010, and later formats	Some versions of SAS may not support the Chinese, Japanese, or Korean DBCS character sets or *.xlsb Excel files.

3.5 Overview of the Examples

The examples in this chapter will cover several but not all of the DBMS options used with PROC IMPORT. I like to group the input processing for PROC IMPORT into general categories within the DBMS options. Furthermore, I feel I must place a caveat onto these groupings because both SAS and Microsoft Excel are mature products that have changed over time. While these categories are generally accurate, your SAS version, Excel version, and computer hardware may not support every DBMS option, and each DBMS option might operate slightly differently depending upon what software you have installed. So make sure you verify what is available to you by looking in the SAS manual that relates to your environment.

- An example retained for backward compatibility with files in the Excel 4 and Excel 5 formats.
- Text file output options like CSV, TAB and DLM do not require SAS/ACCESS Interface to PC Files because the methods read text files.
- Options that read directly from a formatted Excel file.
- LIBNAME options that both use and do not use the SAS PC Files Server.

The options that generate text files will show one example and explain the differences that make the other options work.

3.6 List of Examples

Table 3.6.1 is a general description of the functions included in the examples shown in this chapter. Some of the examples here have minor overlaps in the features to show how they interact when additional features are included.

Table 3.6.1: List of Examples for PROC IMPORT.

Example Number	General Description
3.1	**PROC IMPORT Using the DBMS=EXCEL4 or EXCEL5 Option.** This example is included for backward compatibility with Excel formats Excel 4 and Excel 5, although I would consider it rare to find a computer using this Microsoft Excel software today. The example shows how to read to these old Excel formats.
3.2	**PROC IMPORT Using the DBMS=DLM Option.** This example shows how to use a delimiter to separate input values and read the header row of the input file as data. This example is equivalent to DBMS=CSV and DBMS=TAB but allows you to provide your own delimiter.
3.3	**PROC IMPORT Using the DBMS=EXCEL Option.** The three parts of this example all read Excel workbooks that do not need the PC Files

Example Number	General Description
	Server to be processed. The main point of these code routines is to show how to read parts of worksheets within one workbook, and to change variable names and labels as the data is read from Excel into a SAS dataset.
3.4	**PROC IMPORT Using the DBMS=EXCELCS Option.** This example shows code that was executed on a 64-bit operating system using a 64-bit copy of SAS 9.3 and a 32-bit copy of Microsoft Excel. Since this computer operating system and SAS use a 64-bit configuration but Excel uses a 32-bit configuration, PROC IMPORT requires the use of the SAS PC Files Server. The “CS” part of DBMS=EXCELCS annotates this feature is in use.
3.5	**PROC IMPORT Using the DBMS=XLS or XLSX to Select Columns.** This example reads an Excel worksheet with no column headers (variable names) in the output Excel worksheet. It also demonstrates that PROC IMPORT will read an Excel sheet name with spaces.
3.6	**PROC IMPORT Using the DBMS=XLS or XLSX to Select Rows.** Reading Excel data from selected rows of an Excel worksheet.
3.7	**PROC IMPORT Using the DBMS=XLS or XLSX to Select Excel Ranges.** This example shows you how to use PROC IMPORT to read a range of cells from an Excel worksheet.

Example 3.1 PROC IMPORT Using the DBMS=EXCEL4 or EXCEL5 Option

The SAS IMPORT procedure maintains the backward compatibility features required to process Excel workbooks in the Excel 4 and Excel 5 formats. This example shows how to write Excel files in those formats. For Excel 4 workbooks the sheet name is the same as the file name (without the .xls) and there is only one sheet in the workbook. For Excel 5 formatted workbooks, the sheet name is “Sheet1”.

```
* SAS code to import data from an Excel4 file.;
* there is only one sheet in Excel4 files;
PROC IMPORT
   DATAFILE='C:\My_Files\shoes_to_Excel_4_file.xls'
   DBMS=EXCEL4
   OUT=shoes_from_Excel_4
   REPLACE;
RUN;

* SAS code to import data from an Excel 5 file.;
PROC IMPORT
   DATAFILE='C:\My_Files\shoes_to_Excel_5_file.xls'
   DBMS=EXCEL5
   OUT=shoes_from_Excel_5
   REPLACE;
RUN;
```

Example 3.2 PROC IMPORT Using the DBMS=DLM Option

Using PROC IMPORT to read delimited files in Base SAS invokes the External File Interface (EFI), and the following code reads in a delimited file with commas as the delimiter from the external file named Shoes.csv in directory c:\My_files. This example uses the DBMS=DLM option with the DELIMITER=’,’ option to select a comma for the delimiter. In addition, it uses the DATAROW=1 and GETNAMES=NO options. These options cause the input SAS file to make the first row from the *.csv file appear as data in the SAS file.

NOTE: In Example 2.2 in Chapter 2, the code for PROC EXPORT used the PUTNAMES=NO option to write the `'c:\My_Files\Shoes.csv'` output file with no variable names in the first row of the file.

The output log listing below shows the External File Interface SAS code created by the “Generated SAS Datastep” when the PROC IMPORT step above ran. Notice that the input *.csv file did not have a row of headers associated with the data. So, SAS assigned variable names to the input variables (VAR1 to VAR7).

```
PROC  IMPORT
   DATAFILE='c:\My_Files\Shoes.txt'
   DBMS=DLM
     OUT=shoes
     REPLACE;

   DELIMITER=',';
   DATAROW=1;
   GETNAMES=NO;
   GUESSINGROWS=400;
RUN;
```

Output 3.1: Listing of the External File Interface Code Generated.

```

PROC  IMPORT
    DATAFILE='c:\My_Files\Shoes.txt'
    DBMS=DLM
    OUT=shoes
    REPLACE;

    DELIMITER=',';
    DATAROW=1;
    GETNAMES=NO;
    GUESSINGROWS=400;
RUN;

 /**********************************************************************
 *   PRODUCT:   SAS
 *   VERSION:   9.4
 *   CREATOR:   External File Interface
 *   DATE:      17FEB14
 *   DESC:      Generated SAS Datastep Code
 *   TEMPLATE SOURCE:  (None Specified.)
 ***********************************************************************/
   data WORK.SHOES    ;
   %let _EFIERR_ = 0; /* set the ERROR detection macro variable */
   infile 'c:\My_Files\Shoes.txt' delimiter = ',' MISSOVER DSD lrecl=32767 ;
       informat VAR1 $25. ;
       informat VAR2 $14. ;
       informat VAR3 $12. ;
       informat VAR4 best32. ;
       informat VAR5 $12. ;
       informat VAR6 $12. ;
       informat VAR7 $9. ;
       format VAR1 $25. ;
       format VAR2 $14. ;
       format VAR3 $12. ;
       format VAR4 best12. ;
       format VAR5 $12. ;
       format VAR6 $12. ;
       format VAR7 $9. ;
    input
```

```
39                  VAR1 $
40                  VAR2 $
41                  VAR3 $
42                  VAR4
43                  VAR5 $
44                  VAR6 $
45                  VAR7 $
46       ;
47       if _ERROR_ then call symputx('_EFIERR_',1);  /* set ERROR detection
macro variable */
48       run;

NOTE: The infile 'c:\My_Files\Shoes.txt' is:
      Filename=c:\My_Files\Shoes.txt,
      RECFM=V,LRECL=32767,File Size (bytes)=24901,
      Last Modified=17Feb2014:15:55:41,
      Create Time=17Feb2014:16:14:58

NOTE: 395 records were read from the infile 'c:\My_Files\Shoes.txt'.
      The minimum record length was 37.
      The maximum record length was 85.
NOTE: The data set WORK.SHOES has 395 observations and 7 variables.
NOTE: DATA statement used (Total process time):
      real time           0.07 seconds
      cpu time            0.03 seconds

395 rows created in WORK.SHOES from c:\My_Files\Shoes.txt.

NOTE: WORK.SHOES data set was successfully created.
NOTE: The data set WORK.SHOES has 395 observations and 7 variables.
NOTE: PROCEDURE IMPORT used (Total process time):
      real time           0.53 seconds
      cpu time            0.14 seconds
```

For SAS 6.12 and above, the External File Interface writes out "Generated SAS Datastep Code" that could be captured and used elsewhere. The DELIMITER= statement is active only when DBMS=DLM, and this tells PROC IMPORT what character separates the data values within the input file. When DBMS= has a value of CSV or TAB, SAS assumes a delimiter of a comma or Tab character, respectively. The fact that the file name was "Shoes.txt" caused the "**file-format-specific-statement"** DELIMITER=DLM to identify the input file as a text file with values separated by commas not the default of spaces for *.txt files.

Example 3.3 PROC IMPORT Using the DBMS=EXCEL Option

Example 3.3 – Part 1

The code in parts 1, 2, and 3 of Example 2.3 in Chapter 2 showed how to create an Excel workbook with different numbers of worksheets. The example shows how to create worksheet names with mixed-case letters in the name. However, this method will not write an Excel worksheet with a blank in the sheet name. The following code will read the Excel file and produce a SAS dataset called "Shoes" in the Work directory. Notice that the RANGE= value for the spreadsheet name was in capital letters and ended in a Dollar sign "$". The spreadsheet name in the "RANGE=" statement did not need to be in uppercase letters.

```
PROC IMPORT
   DATAFILE='c:\My_Files\Shoes.xls'
   DBMS=EXCEL
   OUT=shoes
   REPLACE;
   RANGE='SHOES$'n;
RUN;
```

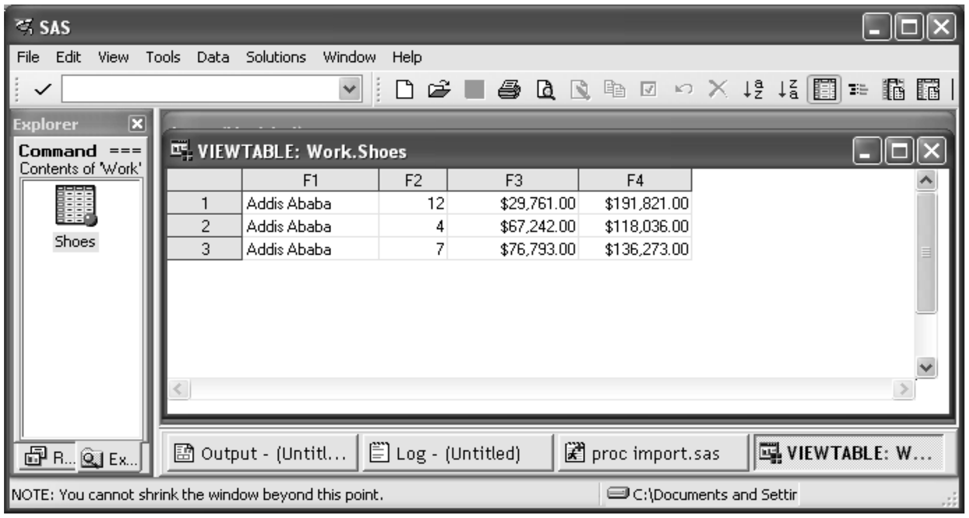
Example 3.3 – Part 2.

If we want only part of the input Excel file, there are several ways to go about getting just what we want. The following code brings in only a few cells from the input Excel file. Here, we will also suppress the request to pull the variable names from the first row of the input data, since we are pulling data from the middle of the Excel file.

```
PROC IMPORT
   DATAFILE='c:\My_Files\Shoes.xls'
   DBMS=EXCEL
   OUT=shoes
   REPLACE;
   GETNAMES=NO;
   RANGE='shoes$C2:F4'n;
RUN;
```

This SAS code does that job. The added command “GETNAMES=NO” and the modification of the “RANGE=” operand are the key parts of this SAS code. The SAS output file looks something like the following:

Figure 3.1: SAS Output from Reading the Excel Range Using Absolute Addressing of Excel Cells.



	F1	F2	F3	F4
1	Addis Ababa	12	$29,761.00	$191,821.00
2	Addis Ababa	4	$67,242.00	$118,036.00
3	Addis Ababa	7	$76,793.00	$136,273.00

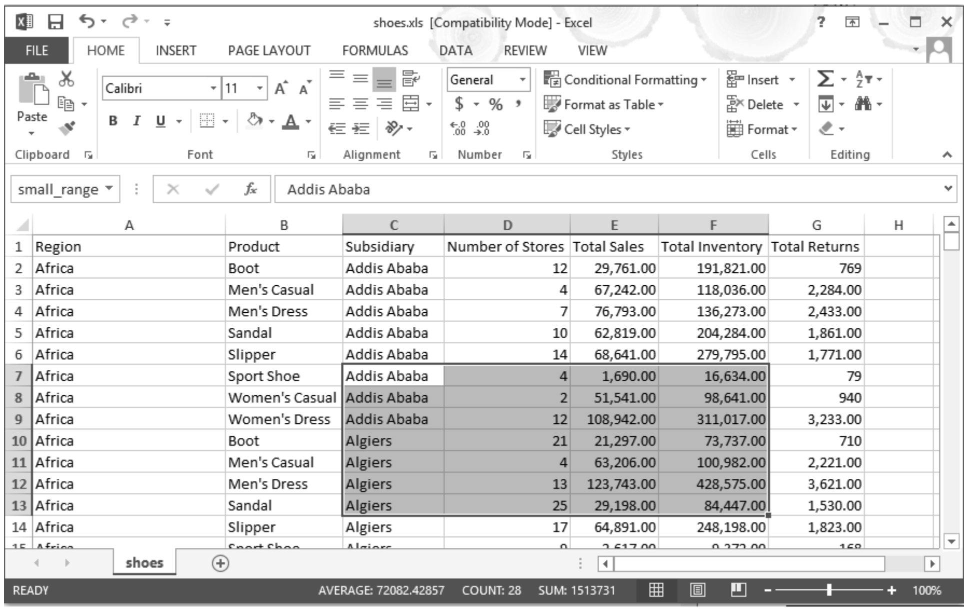
NOTE: You cannot shrink the window beyond this point.

Only 12 cells were read from the Excel worksheet called “SHOES” and the SAS variable names were converted to F1, F2, F3, and F4 because the GETNAMES=NO statement suppressed reading any variable names. The “RANGE=” worksheet name value was in lowercase and included the location of the Excel cells to read into the SAS dataset.

Example 3.3 – Part 3

Users of Excel Workbooks have the option of creating subsets of cells in a worksheet that can be called by name; these areas are called Named-Ranges. Figure 3.2 below shows one of these named ranges called “small_range”. The range name was created while running Excel with the workbook Shoes.xls open.

Figure 3.2: An Excel 2013 Worksheet with a Named Range Called "small_range" Highlighted.



	A	B	C	D	E	F	G	H
1	Region	Product	Subsidiary	Number of Stores	Total Sales	Total Inventory	Total Returns	
2	Africa	Boot	Addis Ababa	12	29,761.00	191,821.00	769	
3	Africa	Men's Casual	Addis Ababa	4	67,242.00	118,036.00	2,284.00	
4	Africa	Men's Dress	Addis Ababa	7	76,793.00	136,273.00	2,433.00	
5	Africa	Sandal	Addis Ababa	10	62,819.00	204,284.00	1,861.00	
6	Africa	Slipper	Addis Ababa	14	68,641.00	279,795.00	1,771.00	
7	Africa	Sport Shoe	Addis Ababa	4	1,690.00	16,634.00	79	
8	Africa	Women's Casual	Addis Ababa	2	51,541.00	98,641.00	940	
9	Africa	Women's Dress	Addis Ababa	12	108,942.00	311,017.00	3,233.00	
10	Africa	Boot	Algiers	21	21,297.00	73,737.00	710	
11	Africa	Men's Casual	Algiers	4	63,206.00	100,982.00	2,221.00	
12	Africa	Men's Dress	Algiers	13	123,743.00	428,575.00	3,621.00	
13	Africa	Sandal	Algiers	25	29,198.00	84,447.00	1,530.00	
14	Africa	Slipper	Algiers	17	64,891.00	248,198.00	1,823.00	

The SAS code below shows how to read the data from the Excel named-range called "small_range" into a SAS dataset. Because the GETNAMES=NO option is used, the variable names F1, F2, F3, and F4 that SAS generated are relatively vague variable names; this example will address a way to correct that issue. The DBDSOPTS= option allows you to use other SAS dataset options to change the output SAS dataset while it is being created. The SAS RENAME= dataset option was used here to change the variable names from F1, F2, … to more descriptive variable names. This is done in one pass over the data and makes the output file more useful when PROC IMPORT finishes. You do not need to make another pass over the data to rename the variables. The PROC DATASETS code adds LABEL values to the SAS dataset. The DBMS=EXCEL form of PROC IMPORT does not allow variable labels to be modified on input of the data; therefore, other code is needed to change the variable labels.

```
PROC IMPORT
   DATAFILE='c:\My_Files\Shoes.xls'
   DBMS=EXCEL
   OUT=shoes
   REPLACE;
   GETNAMES=NO;
   DBDSOPTS='RENAME=(F1=Subsidiary F2=Stores F3=Sales F4=Inventory)';
   RANGE=small_range;
RUN;
PROC DATASETS LIBRARY=work NOLIST;
    MODIFY shoes;
       LABEL Subsidiary = "Subsidiary"
             Stores     = "Stores"
             Sales      = "Sales"
             Inventory  = "Inventory";
QUIT;
```

Output 3.1: Listing of the PROC IMPORT Code generated and the PROC DATASETS Listing.

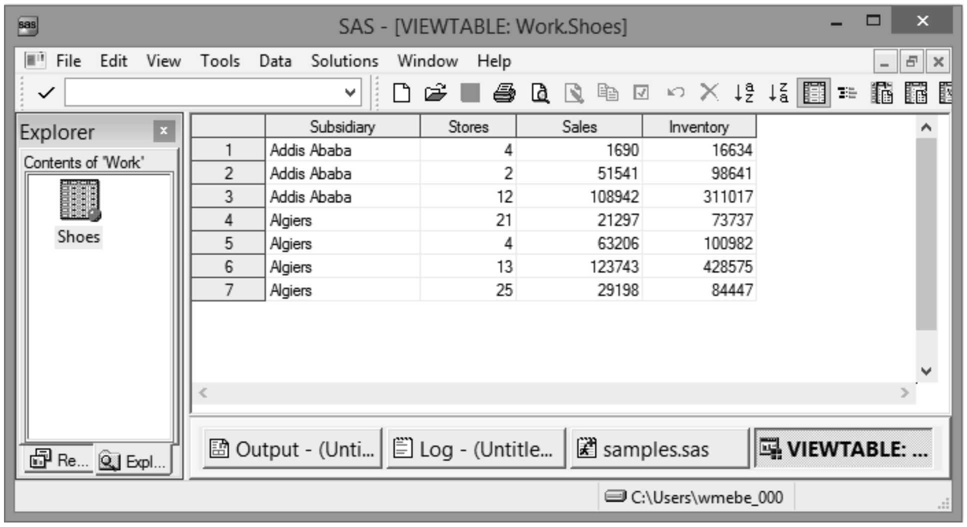
```
1
2
3    PROC IMPORT
4        DATAFILE='c:\My_Files\Shoes.xls'
5        DBMS=EXCEL
6        OUT=shoes
7        REPLACE;
8        GETNAMES=NO;
9        DBDSOPTS='RENAME=(F1=Subsidiary F2=Stores F3=Sales F4=Inventory)';
10       RANGE=small_range;
11   RUN;

NOTE: WORK.SHOES data set was successfully created.
NOTE: The data set WORK.SHOES has 7 observations and 4 variables.
NOTE: PROCEDURE IMPORT used (Total process time):
      real time           0.17 seconds
      cpu time            0.06 seconds


12   PROC DATASETS LIBRARY=work NOLIST;
NOTE: Writing HTML Body file: sashtml.htm
13      MODIFY shoes;
14         LABEL Subsidiary = "Subsidiary"
15               Stores     = "Stores"
16               Sales      = "Sales"
17               Inventory  = "Inventory";
18   QUIT;

NOTE: MODIFY was successful for WORK.SHOES.DATA.
NOTE: PROCEDURE DATASETS used (Total process time):
      real time           0.25 seconds
      cpu time            0.15 seconds
```

Figure 3.3: The SAS Dataset Created by the Code Above.



	Subsidiary	Stores	Sales	Inventory
1	Addis Ababa	4	1690	16634
2	Addis Ababa	2	51541	98641
3	Addis Ababa	12	108942	311017
4	Algiers	21	21297	73737
5	Algiers	4	63206	100982
6	Algiers	13	123743	428575
7	Algiers	25	29198	84447

Example 3.4 PROC IMPORT Using the DBMS=EXCELCS Option

This example is similar to Example 3.2, but the code was executed on a Windows 64-bit configuration. The 64-bit operating system requires the use of the PC Files Server to execute any PROC IMPORT code where DBMS=EXCELCS. The SAS code for Part 1 reads the full Excel worksheet. The difference in the code is the use of the DBMS=EXCELCS option. Note that in most cases the “named-constants” are used as part of the syntax of the RANGE= option; the "named-constants" are not required when a range-name is used with the RANGE= statement.

Example 3.4 – Part 1

The following SAS code reads a full worksheet from an Excel file on a 64-bit computer; the DBMS=EXCELCS option uses the SAS PC Files Server to access and read the input Excel 32-bit workbook.

```
PROC IMPORT
   DATAFILE='c:\My_Files\Shoes.xlsb'
   DBMS=EXCELCS
   OUT=shoes
   REPLACE;
   RANGE='SHOES$'n;
RUN;
```

Example 3.4 – Part 2

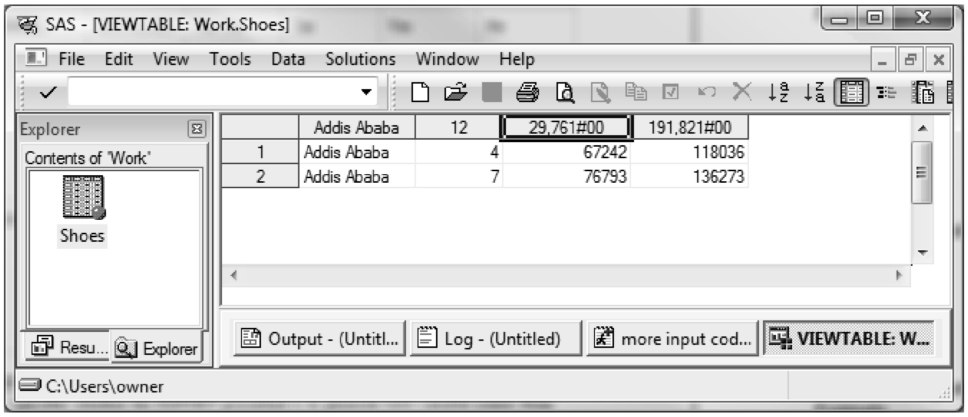
The following segment of SAS code, while syntactically correct, reads the first row of data as variable names and produces unpredictable results because GETNAMES= is not supported when DBMS=EXCELCS. This code is intended to read three rows of data from the input Excel file. However, the first row is interpreted as SAS variable names.

NOTE: The RANGE= value includes Excel cell references, which may not produce your desired output because the GETNAMES= statement is not supported when using the DBMS=EXCELCS option. I suggest that you use the DBMS=XLSX option instead, as shown in Example 3.5. This example shows what happens if you do not use the DBMS=XLSX statement.

```
/* this code does not work */
PROC IMPORT
   DATAFILE='c:\My_Files\Shoes.xlsb'
   DBMS=EXCELCS
   OUT=shoes
   REPLACE;
   RANGE='shoes$C2:F4'n;
RUN;
```

Figure 3.4 shows the output SAS dataset generated by the PROC IMPORT code from above. The intended result was to read three data rows into the SAS dataset. However, the first row was read and translated into variable names.

Figure 3.4: The SAS Dataset Created by the Code Above.



	Addis Ababa	12	29,761#00	191,821#00
1	Addis Ababa	4	67242	118036
2	Addis Ababa	7	76793	136273

Example 3.5 PROC IMPORT Using the DBMS=XLS or XLSX to Select Columns

When using the DBMS=XLS option of PROC IMPORT with the ENDCOL and STARTCOL statements, the output SAS dataset is restricted to only the columns requested. This works like a KEEP statement, except the columns have to be contiguous. The input file is the SASHELP.SHOES dataset as exported to an Excel file. This example imports columns 2, 3, and 4 (Product, Subsidiary, and Number of Stores).

NOTE: There is a comment in the SAS log about a name change for the variable named “Number of Stores” because this text value has spaces embedded in the value. The value shown in Figure 3.5a for column 3 (Number of Stores) is the label applied to the variable named “Number_of_Stores”. Also, ENDCOL= was placed before STARTCOL= to show the statement order is not important. The output SAS dataset has data from three rows and five columns of the input Excel worksheet.

```
PROC IMPORT
  DATAFILE='c:\My_Excel_Files\Shoes.xls'
  DBMS=XLS
  OUT=shoes
  REPLACE;
  ENDCOL="4";
  STARTCOL="2";
RUN;
```

The system output log for Example 3.5 shows the name change of the variable “Number of Stores.” The log also verifies that only three columns were output to the SAS dataset from Excel.

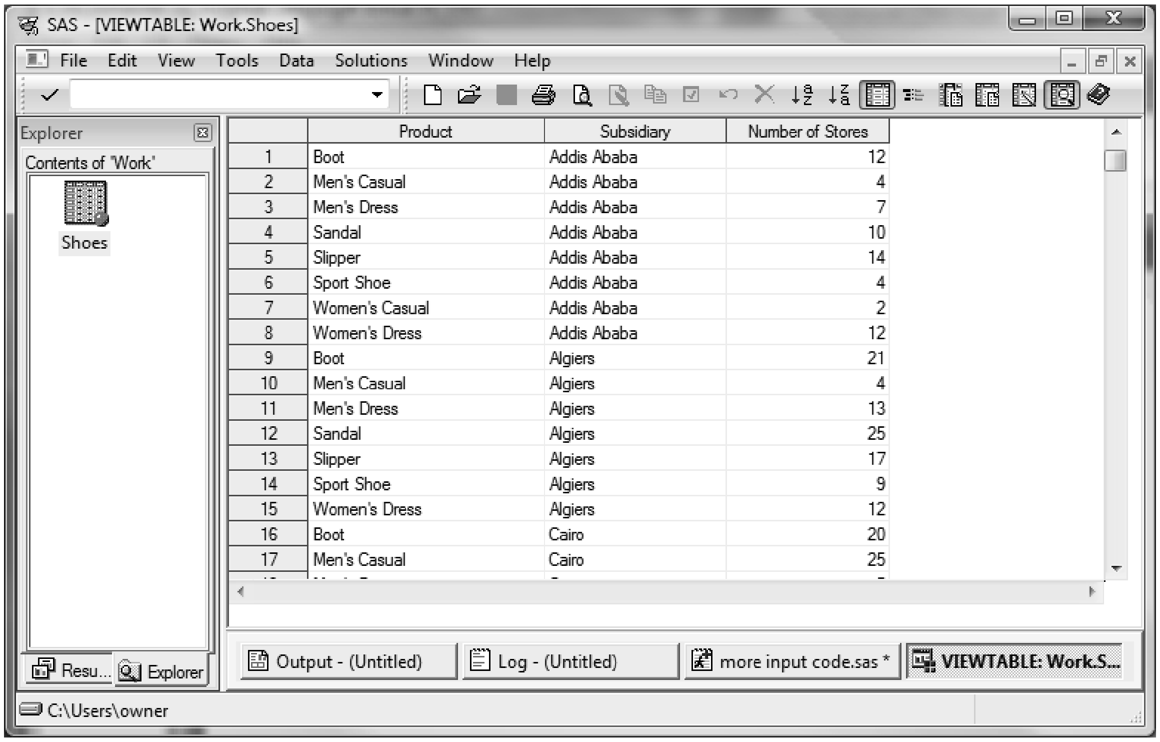
```
1   PROC IMPORT
2       DATAFILE='c:\My_Excel_Files\Shoes.xls'
3       DBMS=XLS
4       OUT=shoes
5       REPLACE;
6       ENDCOL="4";
7       STARTCOL="2";
8   RUN;

NOTE:    Variable Name Change.  Number of Stores -> Number_of_Stores
NOTE: The import data set has 395 observations and 3 variables.
NOTE: WORK.SHOES data set was successfully created.
NOTE: PROCEDURE IMPORT used (Total process time):
      real time           0.03 seconds
      cpu time            0.04 seconds
```

SAS output dataset:

In Figure 3.5a, the SAS dataset label shown for the variable Number_of_Stores has two spaces; however, the actual variable name does not have any spaces embedded.

Figure 3.5a: The SAS Dataset Created by the Code Above.



	Product	Subsidiary	Number of Stores
1	Boot	Addis Ababa	12
2	Men's Casual	Addis Ababa	4
3	Men's Dress	Addis Ababa	7
4	Sandal	Addis Ababa	10
5	Slipper	Addis Ababa	14
6	Sport Shoe	Addis Ababa	4
7	Women's Casual	Addis Ababa	2
8	Women's Dress	Addis Ababa	12
9	Boot	Algiers	21
10	Men's Casual	Algiers	4
11	Men's Dress	Algiers	13
12	Sandal	Algiers	25
13	Slipper	Algiers	17
14	Sport Shoe	Algiers	9
15	Women's Dress	Algiers	12
16	Boot	Cairo	20
17	Men's Casual	Cairo	25

Example 3.6 PROC IMPORT Using the DBMS=XLS or XLSX to Select Rows

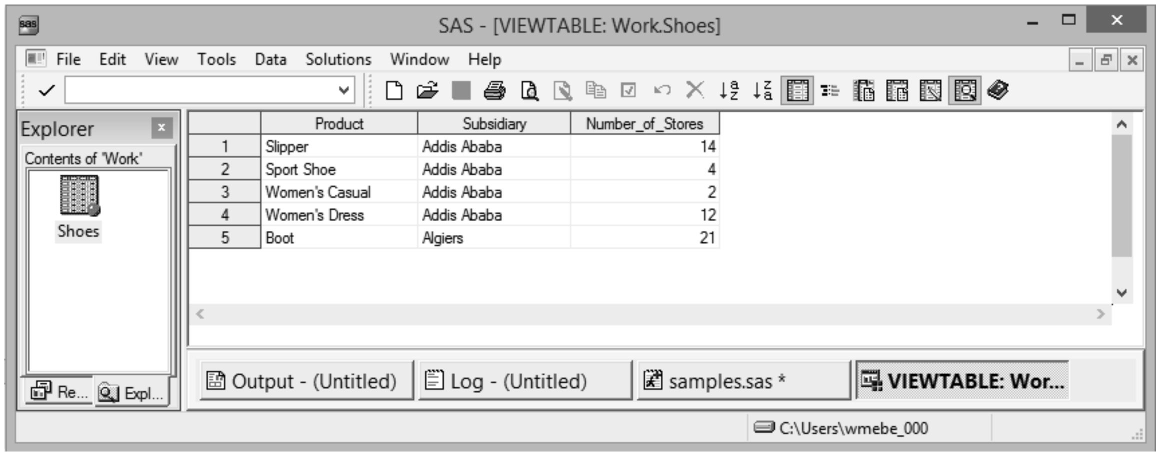
This example uses the PROC IMPORT option pairs STARTROW= / ENDROW= and STARTCOL= / ENDCOL= to show you how you can select a range of cells from an Excel worksheet without creating a named range in an Excel workbook. When the NAMEROW=, GETNAMES=, and RANGE= statements are added to the mix, you can pick names for your variable from inside the Excel file without needing a second pass over the dataset or the need to use PROC DATASETS. The text values with spaces embedded in the value have had an underscore added to replace the space in the variable name. Also, ENDROW= was placed before STARTROW= to show the statement order in not important. The output SAS dataset has data from three columns and five rows of the input Excel worksheet.

```
PROC IMPORT
   DATAFILE='c:\My_Files\Shoes.xls'
   DBMS=XLS
   OUT=shoes
   REPLACE;
   ENDCOL="4";      /* a quoted string is required */
   STARTCOL="2";    /* a quoted string is required */
   ENDROW=10;       /* numeric value is required   */
   STARTROW=6;      /* numeric value is required   */
   NAMEROW=1;
   GETNAMES=NO;
RUN;
```

Output Log of Code Above

```
1
2
3    PROC IMPORT
4        DATAFILE='c:\My_Files\Shoes.xls'
5        DBMS=XLS
6        OUT=shoes
7        REPLACE;
8        ENDCOL="4";      /* a quoted string is required */
9        STARTCOL="2";    /* a quoted string is required */
10       ENDROW=10;       /* numeric value is required   */
11       STARTROW=6;      /* numeric value is required   */
12       NAMEROW=1;
13       GETNAMES=NO;
14   RUN;
NOTE:    Variable Name Change.  Number of Stores -> Number_of_Stores
NOTE: The import data set has 5 observations and 3 variables.
NOTE: WORK.SHOES data set was successfully created.
NOTE: PROCEDURE IMPORT used (Total process time):
      real time           0.06 seconds
      cpu time            0.01 seconds
```

Figure 3.5b: Using PROC IMPORT to Select Rows and Headers from an Excel Worksheet.



	Product	Subsidiary	Number_of_Stores
1	Slipper	Addis Ababa	14
2	Sport Shoe	Addis Ababa	4
3	Women's Casual	Addis Ababa	2
4	Women's Dress	Addis Ababa	12
5	Boot	Algiers	21

Example 3.7 PROC IMPORT Using the DBMS=XLS or XLSX to Select Excel Ranges

This example was executed on a computer running 64-bit Windows 8.1 Professional on 64-bit hardware with SAS 9.4 and 32-bit Excel 2013 installed. The DBMS option XLSX provides an alternative method to reading a small group of cells from an Excel spreadsheet. However, this method does not always provide reliable variable names when GETNAMES=YES. GETNAMES=YES looks for variable names in the first row of input cells. Here, GETNAMES=NO is used to turn off the search for variable names in the Excel file. The RANGE='shoes$C2:F4'n command selects only 12 cells from the Excel file.

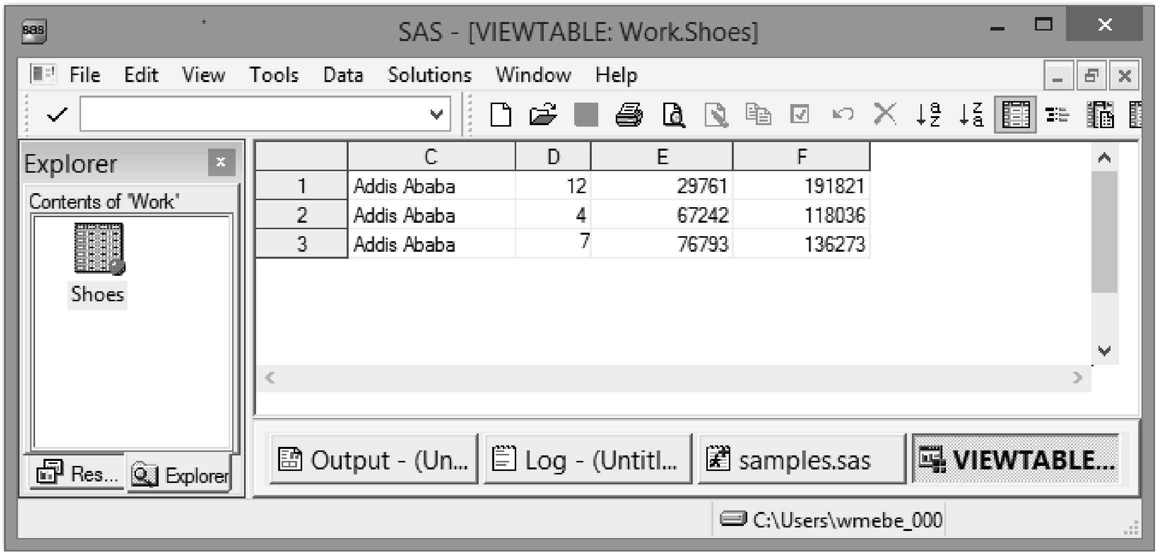
```
PROC IMPORT
    DATAFILE='c:\My_Files\Shoes.xlsx'
    DBMS=XLSX
    OUT=shoes
    REPLACE;
    GETNAMES=NO;
    RANGE='shoes$C2:F4'n;
RUN;
```

```


     PROC IMPORT
         DATAFILE='c:\My_Files\Shoes.xlsx'
         DBMS=XLSX
         OUT=shoes
         REPLACE;
         GETNAMES=NO;
         RANGE='shoes$C2:F4'n;
     RUN;

NOTE: The import data set has 3 observations and 4 variables.
NOTE: WORK.SHOES data set was successfully created.
NOTE: PROCEDURE IMPORT used (Total process time):
      real time           0.03 seconds
      cpu time            0.01 seconds
```

Figure 3.6: SAS Output When Using PROC IMPORT to Select a Group of Cells from an Excel Spreadsheet.



	C	D	E	F
1	Addis Ababa	12	29761	191821
2	Addis Ababa	4	67242	118036
3	Addis Ababa	7	76793	136273

3.7 Conclusion

I have shown several methods of reading data and variable names from Excel workbooks. But, there are far too many other combinations of options available for me to present an exhaustive list. This chapter showed features of PROC IMPORT. Some of the important items to take away from this chapter are that the Microsoft Excel JET and ACE engines have limitations. These limitations will occasionally affect the amount of data you can extract from your Excel files. There may be times when you are required to fall back to the tried-and-true delimited file formats to transfer your data to and from Excel. I suggest that you refer to *SAS/ACCESS Interface to PC Files: Reference* for the version of SAS that you have installed. These documents have SAS version-specific descriptions of the syntax and features available for the SAS Import Wizard and PROC IMPORT.

From Exchanging Data Between SAS® and Microsoft Excel: Tips and Techniques to Transfer and Manage Data More Efficiently, by William E. Benjamin, Jr. Copyright © 2015, SAS Institute Inc., Cary, North Carolina, USA. ALL RIGHTS RESERVED.

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About This Book

Purpose

I wrote this book to help SAS users of all skill levels find out how to move data between SAS and Microsoft Excel. My years of programming experience have helped me decode the mysteries of vendor-supplied system documentation. I wanted to gather that information together and present it in an easy-to-understand tutorial format with the prime emphasis on examples. I have also scattered in my observations on the world of programming in general and pieced together an array of examples that include both simple and complex task descriptions.

Is This Book for You?

Whatever your skill level, I hope you will find examples that will teach you something. In every class I teach or paper I present, I always ask if anyone learned anything. I want you to be able to find a place on your desk for this book, use it as you progress through the skills presented, and gain expertise to easily move your data.

Prerequisites

This book is designed for you to use without need for prerequisites. If you can open the SAS program and copy data using your mouse, then you can get started. I do not attempt to teach you how to write SAS programs or build an Excel spreadsheet, but I present methods to move data between the two data storage tools.

Scope of This Book

This book attempts to show you how to move data "BETWEEN" SAS and Excel. I have attempted to use as many differing techniques as I could within the limited space available. As I worked my way through the chapters, I created examples that progressively increased in power and complexity.

But, what I do not do is show you very much about how to use the data after it is moved or copied into either Excel or SAS. Within this book I have covered many ways that show you how to shuffle your data between SAS and Excel. I hope I have also opened ways to manipulate the worksheets after they have been written. I have tried to keep the data simple and only change the methods. In fact, nearly every example uses the same SAS dataset, as noted below.

About the Examples

Software Used to Develop the Book's Content

Because SAS users are likely to be working with different SAS versions, I have included examples that use several versions of SAS software. Most of the examples use SAS 9.4. Some JMP examples and SAS Enterprise Guide examples are also shown. Examples of Excel screens also vary across several versions of Excel, from Excel 2003 to Excel 2013. The examples in the book cover the transition from the xls workbooks to the xlsx workbooks and the way SAS has adapted to those Excel changes.

Example Code and Data

The primary dataset used for examples in this book is the SASHELP.SHOES SAS dataset; it is used as an exported file to Excel and then as input from Excel. The SASHELP.SHOES dataset is shipped with every version of SAS and is therefore convenient for all users.

You can access the example code and data for this book by accessing my author page at http://support.sas.com/publishing/authors. Select the name of the author, look for the cover thumbnail of this book, and select Example Code and Data to display the SAS programs that are included in this book.

For an alphabetical listing of all books for which example code and data is available, see http://support.sas.com/bookcode. Select a title to display the book's example code.

If you are unable to access the code through the website, email saspress@sas.com.

Additional Help

Although this book illustrates many analyses regularly performed in businesses across industries, questions specific to your aims and issues may arise. To fully support you, SAS Institute and SAS Press offer you the following help resources:

- For questions about topics covered in this book, contact the author through SAS Press:
  - Send questions by email to saspress@sas.com; include the book title in your correspondence.
  - Submit feedback on the author's page at http://support.sas.com/author_feedback.
- For questions about topics in or beyond the scope of this book, post queries to the relevant SAS Support Communities at https://communities.sas.com/welcome.
- SAS Institute maintains a comprehensive website with up-to-date information. One page that is particularly useful to both the novice and seasoned SAS user is the SAS Knowledge Base. Search for relevant notes in the "Samples and SAS Notes" section of the Knowledge Base at http://support.sas.com/resources.
- Registered SAS users or their organizations can access SAS Customer Support at http://support.sas.com. Here you can pose specific questions to SAS Customer Support. Under *Support*, click *Submit a Problem*. You will need to provide an email address to which replies can be sent, identify your organization, and provide a customer site number or license information. This information can be found in your SAS logs.

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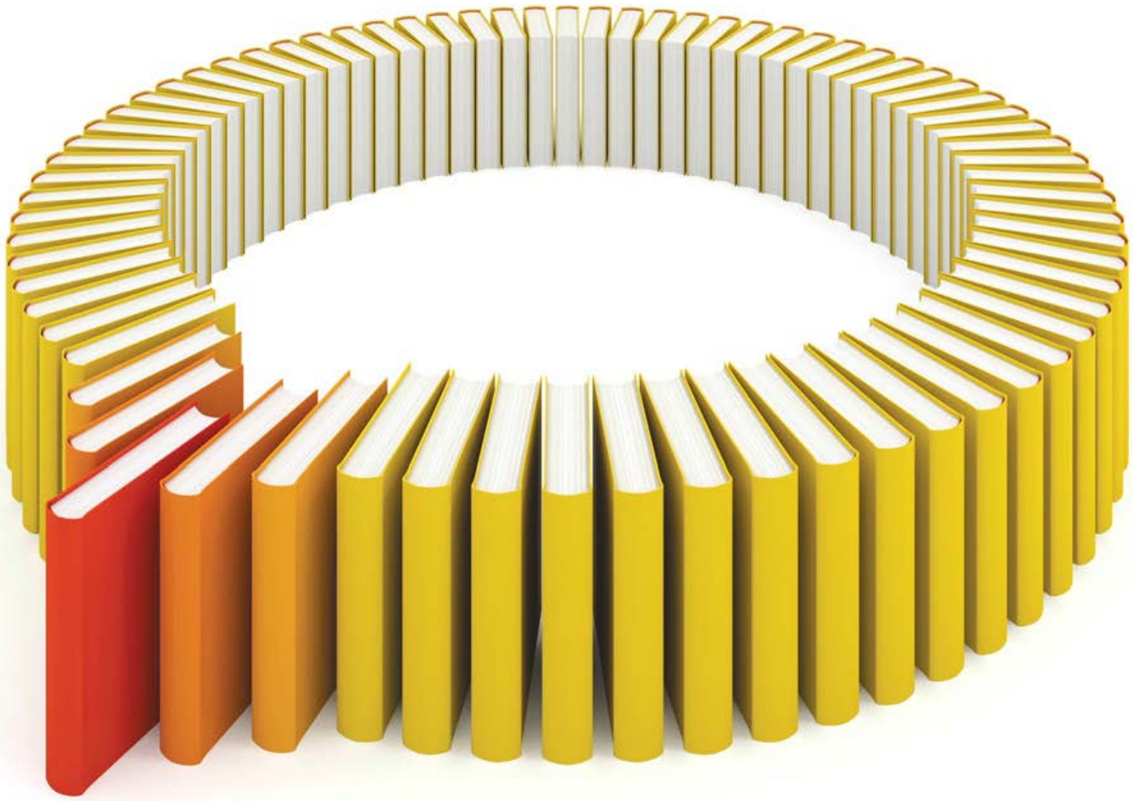
About The Author

William E. Benjamin, Jr., owns Owl Computer Consultancy, LLC, and works as a consultant, trainer, and author. William has been a SAS user for over 30 years and a consultant since 2007. He received an MBA from Western International University and a BS in computer science from Arizona State University. He has written and presented papers for SAS Global Forum, as well as many regional and local SAS users groups.

Learn more about this author by visiting his author page at http://support.sas.com/publishing/authors/benjamin.html. There you can download free book excerpts, access example code and data, read the latest reviews, get updates, and more.



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