

## CHAPTER

**1**

# Introducing the SAS System and SAS/ASSIST Software

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<i>The SAS System</i>	1
<i>Data Access</i>	2
<i>Data Management</i>	2
<i>Data Analysis</i>	2
<i>Data Presentation</i>	2
<i>SAS/ASSIST Software</i>	2
<i>The SAS/ASSIST WorkPlace Environment</i>	3
<i>Buttons on the WorkPlace Menu</i>	4
<i>Data Management</i>	4
<i>Report Writing</i>	4
<i>Graphics</i>	4
<i>Data Analysis</i>	4
<i>Planning Tools</i>	5
<i>Enterprise Information System</i>	5
<i>Remote Connect</i>	5
<i>Results</i>	5
<i>Setup</i>	5
<i>Index</i>	6
<i>Exit</i>	6
<i>WorkPlace Menu Bar Items</i>	6
<i>File</i>	6
<i>Edit</i>	6
<i>View</i>	6
<i>Tools</i>	6
<i>Run</i>	6
<i>Tasks</i>	6
<i>Help</i>	6
<i>Conventions Used in This Book</i>	6
<i>Quick Start</i>	7

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## The SAS System

The SAS System is a modular, integrated, hardware-independent system of software for enterprise-wide information delivery. What distinguishes the software is its ability to

- make enterprise data a generalized resource available to any user or application that requires it, regardless of the source of the data.
- transform enterprise data into meaningful information for a broad range of applications.

- deliver critical information through a variety of interfaces that are tailored to the needs and experience of the individual computer user.
- perform consistently across a broad range of hardware environments while exploiting the particular advantages of each environment.

The SAS System integrates all of these elements into a powerful software system. The SAS System views virtually any application as a collection of data-driven tasks or processes that can be generally classified as described in the following sections.

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## Data Access

Data access is the process of accessing the data required by the application. The SAS System treats enterprise data as an available resource by providing transparent access to

- popular database management systems such as DB2, IMS, INGRES, SYBASE, ORACLE, and DEC Rdb.
- flat files, system-specific host files, and other historical or “legacy” data types
- the SAS System’s own relational data structure.

Through the SAS System’s Multiple Engine Architecture (MEA), these data sources can be combined to provide an enterprise Data Warehouse that gives end users the information they need to do their jobs without jeopardizing the security and integrity of data assets or negatively affecting the performance of production databases.

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## Data Management

Data management is the process of shaping data into a form required by the application. You can manage your data by entering, editing, retrieving, formatting, and converting your data.

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## Data Analysis

Data analysis is the process of transforming raw data into meaningful and useful information. You can analyze your data using descriptive statistics, multivariate techniques, forecasting and modeling, and linear programming.

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## Data Presentation

Data presentation is the process of communicating information in ways that clearly demonstrate its significance. You can present your data by using reports, business and analytical graphics, and business correspondence.

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## SAS/ASSIST Software

SAS/ASSIST software is a menu-driven, task-oriented interface to the SAS System. It enables users of all experience levels to access the power of the SAS System without having to learn SAS programming statements. SAS/ASSIST software enables you to perform tasks efficiently using templates and menus. The way each task works within SAS/ASSIST software is similar. After you master one task, other tasks are easy to complete.

SAS/ASSIST software helps you complete tasks easily by providing features that, for example, identify required fields and display selection lists to prevent user errors. Once you have set up a task, you can save task window selections and run the same task again in a later session. In the background, SAS/ASSIST software automatically generates SAS code with descriptive comments as it performs many of your tasks. You can save, edit, and re-execute this code. The SAS/ASSIST Result Manager enables you to manage your saved tasks and code.

With SAS/ASSIST software, you have a single tool to help you complete many different types of tasks, including end-user reporting, presentation graphics, query and reporting, and decision support. The data access capabilities of the SAS System enable you to use data stored in almost any format or location, ranging from flat files to PC files and database management systems such as DB2, ORACLE, and IMS-DL/I. After you have accessed your data, SAS/ASSIST software gives you a variety of ways to store, manipulate, and transfer data. Additionally, you can combine code generated by SAS/ASSIST with pre-defined objects and SAS Component Language (SCL) to create applications.

SAS/ASSIST software also enables you to customize your environment to accommodate individual and group preferences by setting options in Master, Group, and User profiles. For example, you can use a private menu to add or remove direct access to saved SAS/ASSIST tasks and to specific windows.

SAS/ASSIST software includes an online tutorial, which contains instructions for performing commonly used SAS/ASSIST tasks. You can access the tutorial by selecting **Help** from the WorkPlace menu bar and then selecting **Getting Started with SAS/ASSIST Software**. The Tutorial appears in a separate window, so you can follow the directions in the Tutorial window while you perform the tasks in the SAS/ASSIST window.

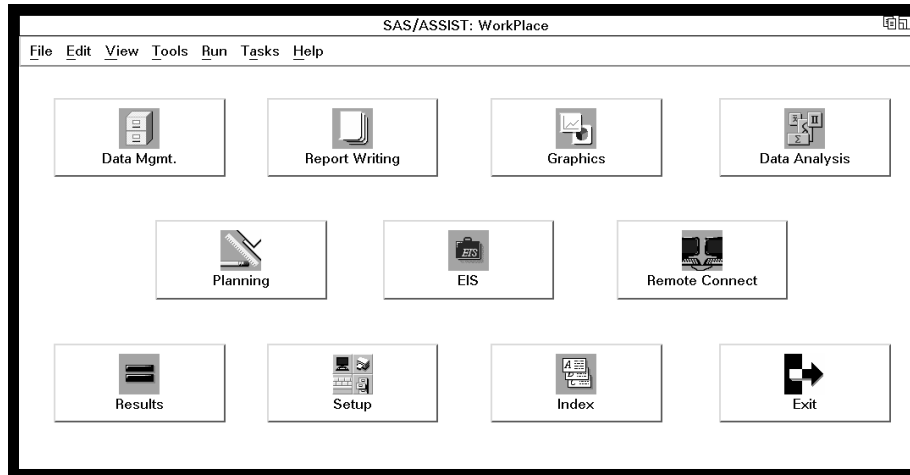
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## The SAS/ASSIST WorkPlace Environment

The user interface to SAS/ASSIST software is called the SAS/ASSIST WorkPlace. The SAS/ASSIST WorkPlace integrates all of the SAS/ASSIST tasks together into one easy-to-use interface. The main menu in the SAS/ASSIST WorkPlace is called the WorkPlace menu. The WorkPlace menu consists of buttons, which can be used to invoke task windows, and a menu bar, which also can be used to invoke task windows and to perform other SAS/ASSIST functions. The menu bar is also available on all SAS/ASSIST task windows.

Descriptions of the buttons on the SAS/ASSIST WorkPlace menu and items on the menu bar follow the picture of the WorkPlace menu shown in the following display.

Display 1.1 WorkPlace Menu




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## Buttons on the WorkPlace Menu

Note that most of the tasks available via the buttons on the WorkPlace menu are also available under the **Tasks** menu. The **Tasks** menu is available on all SAS/ASSIST task windows as well as the WorkPlace menu. In this book, tasks will be accessed via the **Tasks** menu.

### Data Management

**Data Management** enables you to enter new data; look at and change existing data; import data from and export data to an external file; access data from external databases; design data formats and informats; and subset, copy, combine, and sort data. In addition, you can query both SAS tables and data from different databases.

### Report Writing

**Report Writing** enables you to create a variety of reports including simple lists of data; tables that summarize data; tables of frequencies of data; and line printer bar charts, pie charts, and plots. In addition, you can create or modify a report interactively or use the Report Engine window to build different types of reports that are based on SAS tables or views of tables in other formats.

### Graphics

**Graphics** enables you to produce high- and low-resolution graphics including vertical, horizontal, stacked, and grouped bar charts; pie charts; line plots of Y by X values; and maps. To produce high-resolution graphics and maps, you must have SAS/GRAPH software licensed, and you must have high-resolution, graphics-capable hardware.

### Data Analysis

- Data Analysis** offers several analysis tools. With **Data Analysis**, you can
- produce frequency tables or compute summary statistics, correlations, or confidence intervals about the mean

- calculate linear regression, logistic regression, or regression with correction for autocorrelation
- calculate analysis of variance, nonparametric ANOVA, or *t*-tests
- compute principal components or canonical correlations and calculate seasonal adjustment of time series
- produce control charts and perform capability analysis
- perform guided data analysis
- compute percentiles, standardize or rank data, create time-series data, and convert frequency of time-series data.

Many of the data analysis functions require that you have SAS/STAT software, SAS/ETS software, SAS/QC software, SAS/LAB software, or SAS/INSIGHT software licensed.

## Planning Tools

**Planning Tools** helps you to analyze and compare loans, design and analyze experiments, manage projects, create spreadsheets, and forecast time series. Some of the items in **Planning Tools** require that you have SAS/ETS software, SAS/QC software, SAS/OR software, or SAS/CALC software licensed.

## Enterprise Information System

The Enterprise Information System (**EIS**) item on the SAS/ASSIST WorkPlace menu is a gateway to SAS/EIS software, a menu-driven system that lets you develop and run enterprise information systems. SAS/EIS software helps you create and access your own applications, effectively extending the tasks that are already built into SAS/EIS software. You can build menu-driven applications that include graphs, reports, executable programs, host commands, and desktop applications. Additionally, you can use several desktop applications developed by SAS Institute in your enterprise information systems. You must have SAS/EIS software licensed to use this function.

## Remote Connect

**Remote Connect** enables you to establish a SAS session on a remote computer, communicate between that remote session and a local SAS session, run saved programs on the remote computer, and transfer data between the local and remote SAS sessions. You must have SAS/CONNECT software licensed to use **Remote Connect**.

## Results

**Results** enables you to manage your saved SAS/ASSIST tasks, output, and program code by using the Result Manager window. **Results** lets you recall, delete, or rename a program or output; edit or execute a program; redisplay a graph; and print all entry types except types of **MANAGER** or **PROFILE**.

## Setup

**Setup** enables you to control certain aspects of your SAS session, including associating reference names with data libraries or files, managing device drivers and printing forms, sorting data, and reviewing your current function key settings. This item also enables you to set up Master, Group, and User profile options to customize a user's SAS/ASSIST environment.

## Index

**Index** provides you with an alphabetic list of tasks that can be performed with SAS/ASSIST software. To access one of the tasks, select it from the Index list. The software takes you directly to the task. When you exit the task, the software returns you to the Index. This item is useful when you cannot find a task you want to perform.

## Exit

**Exit** lets you exit SAS/ASSIST software.

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## WorkPlace Menu Bar Items

### File

**File** contains such file-management functions as opening, closing, saving, importing, and exporting files.

### Edit

**Edit** contains items that allow you to add titles and footnotes to reports, set page dimensions, and specify page headers.

### View

**View** contains items that allow you to view tables, output, and source code, and to open other SAS System windows.

### Tools

**Tools** contains SAS/ASSIST tools, such as the Setup tools and the Result Manger; SAS System tools, such as the Table Editor and Graphics Editor; and SAS System options.

### Run

**Run** contains commands to run a task locally or remotely and to establish or terminate a connection to a remote host.

### Tasks

**Tasks** contains all the items on the WorkPlace menu buttons except **Index** and **Exit**. This is convenient because you can access one task directly from another without having to return to the main menu first.

### Help

**Help** contains various help items, including the SAS/ASSIST tutorial, SAS System help, and SAS/ASSIST window-specific help.

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## Conventions Used in This Book

Following is a description of the typographical conventions used in this book:

*italic*

Used for new terms.

**monospace**

Used to indicate items in windows or on menus, or items that the user types into the system.

Performing the tasks in this book occasionally requires you to make a series of window and menu selections. Where appropriate, these series are indicated with a selection path. For example,

Tasks ► Graphics ► Maps

In this case, you would select **T**asks from the current window, then select **G**raphics from the resulting pull-down menu, and then select **M**aps from the resulting cascading menu. See “Using Menus” on page 13 for details about using menus.

In this book the word *task* refers to anything you can do with SAS/ASSIST that involves manipulating, reporting, analyzing, and presenting data. SAS/ASSIST tasks can be saved and recalled. These tasks are distinguished from other things you can do with SAS/ASSIST software, such as set-up actions and utility actions. Thus, creating a listing report is a SAS/ASSIST task, but generating the graphics test pattern is not. A *task window* is a SAS/ASSIST window that is the starting point for performing a task. Examples of task windows include the List a Table window and the Bar Charts window.

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## Quick Start

If you are anxious to get started and to see how easy it is to perform tasks using SAS/ASSIST software, follow the steps below to produce a simple listing report. If you prefer a slower pace with more explanation, skip this section and go on to the next chapter.

- 1 Log on to your operating environment and invoke the SAS System. See the SAS Support Consultant at your site if you need assistance logging on or invoking the SAS System.
- 2 Invoke SAS/ASSIST software as follows: From the Program Editor window, follow this selection path:

Solutions ► ASSIST

The SAS/ASSIST Welcome Screen or Start Menu appears. Select **C**ontinue; the WorkPlace menu appears.

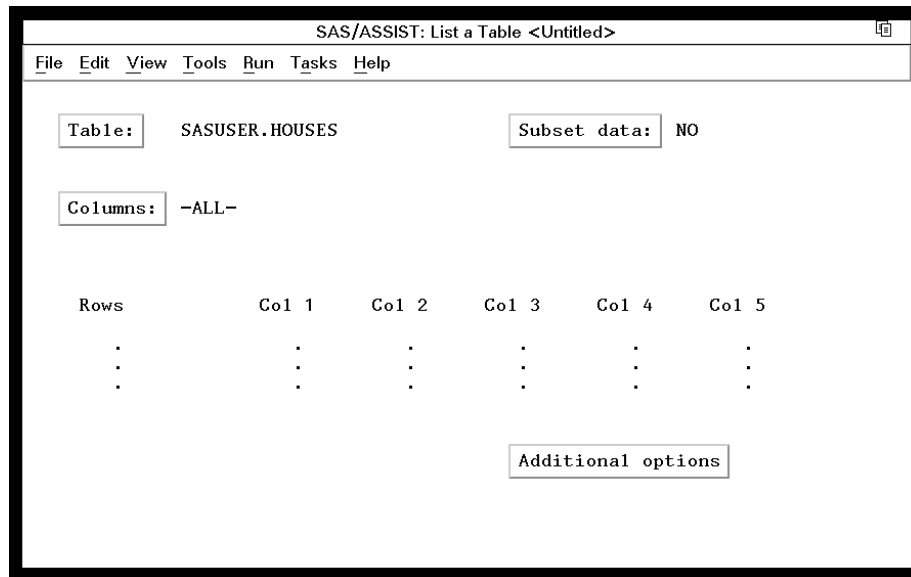
- 3 If you have not already done so, you will need to create the sample tables. Refer to “Creating the Sample Tables” on page 21 for instructions on creating the sample tables.
- 4 From the SAS/ASSIST WorkPlace menu, follow this selection path:

Tasks ► Report Writing ► Listing...

The List a Table window appears.

- 5 Select **T**able. The Select table window appears with a list of available SAS data libraries and tables.
- 6 Select **S**ASUSER from the list of libraries. Then select the **H**OUSES table from the list of tables.
- 7 Select **O**K. The List a Table window reappears.

Display 1.2 List a Table Window



- 8 From the List a Table window, follow this selection path:

**Run** ► **Submit**

The table appears in the Output window. Use the scroll bars to view other parts of the table.

Display 1.3 Listing of HOUSES Table

Style of homes	Square footage	Number of bedrooms	Number of bathrooms	Street address	Asking price
RANCH	1250	2	1.0	Sheppard Avenue	\$64,000
SPLIT	1190	1	1.0	Rand Street	\$65,850
CONDO	1400	2	1.5	Market Street	\$80,050
TWOSTORY	1810	4	3.0	Garris Street	\$107,250
RANCH	1500	3	3.0	Kemble Avenue	\$86,650
SPLIT	1615	4	3.0	West Drive	\$94,450
SPLIT	1305	3	1.5	Graham Avenue	\$73,650
CONDO	1390	3	2.5	Hampshire Avenue	\$79,350
TWOSTORY	1040	2	1.0	Sanders Road	\$55,850
CONDO	2105	4	2.5	Jeans Avenue	\$127,150
RANCH	1535	3	3.0	State Highway	\$89,100
TWOSTORY	1240	2	1.0	Fairbanks Circle	\$69,250
RANCH	720	1	1.0	Nicholson Drive	\$34,550
TWOSTORY	1745	4	2.5	Highland Road	\$102,950
CONDO	1860	2	2.0	Arcata Avenue	\$110,700

- 9 When you are finished looking at the table listing, return to the List a Table window by using one of the following methods, depending on your operating environment:

- Use the PREVWIND function key.
- Click on the SAS/ASSIST window.



**10** Follow this selection path from the List a Table window to return to the WorkPlace menu:

►

The WorkPlace menu reappears.

For more details on report writing, see Chapter 3, "Report Writing," on page 29.