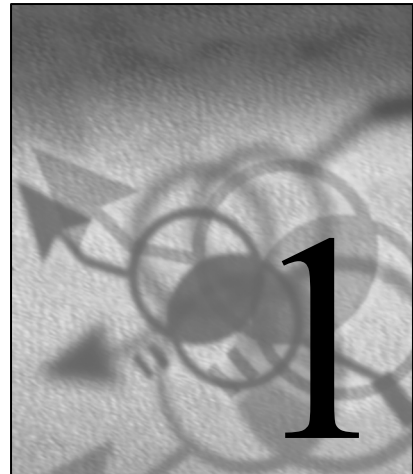


Introduction to SAS Enterprise Guide



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1.1 First Look at SAS Enterprise Guide

1.1.1 Projects

Our work in SAS Enterprise Guide focuses on data sets, tasks, and output files.

- Data sets are files that contain the measurements, counts, and categorizations collected from individuals and objects. Data sets are discussed in Chapter 2, “Working with Data.”
- Tasks are interfaces for underlying SAS software. All the data management and the statistical analysis discussed in this book are supported by tasks.
- When a task produces output, it produces the output in a file.

- The file may be some form of text file, such as an HTML file or a Microsoft Word file. The file may be a SAS data set.
- Options related to these files are generally under a Results heading.

Activity in SAS Enterprise Guide is organized into *projects*. A project is a record of the data sets that have been opened, the tasks that have been run, the results that have been produced, and the relationships between these objects. One project at a time is opened in SAS Enterprise Guide.

A project is represented graphically as a project tree in the Project Explorer and as a process flow diagram in the Project Designer. See Figure 1.2 and Figure 1.3.

The information about the project is in a *project file*. A project file can be saved and copied. It can contain many types of items. In particular, a project file can contain:

- Shortcuts to the data sets that have been opened.
- Details about the tasks that have been run.
- Output files that are not data sets.
- Shortcuts to output data sets.

1.1.2 New Project

SAS Enterprise Guide opens with the window in Figure 1.1. An existing project can be opened or a new project can be created.

Figure 1.1 Welcome Window

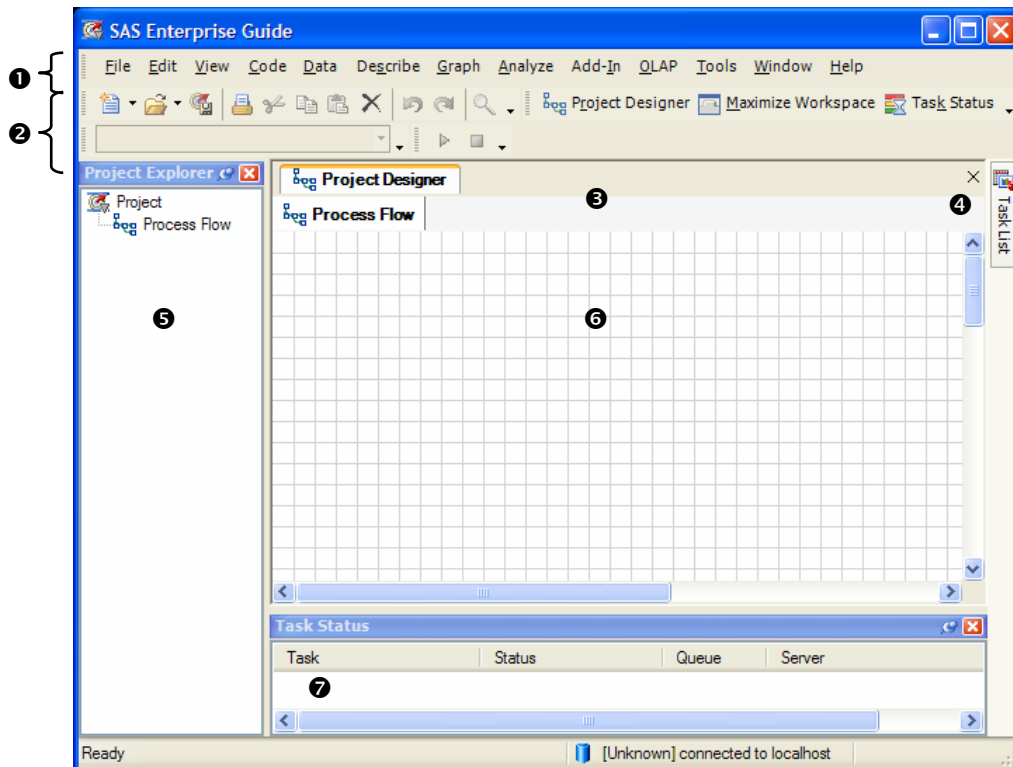


For the current discussion, select **New Project** (🏠). SAS Enterprise Guide opens with a new project. See Figure 1.2.

Selecting **New SAS Program** (📄) creates a new project and opens a window for writing code.

Selecting **New Data** (📊) creates a new project and opens a window for creating a new SAS data set.

Figure 1.2 SAS Enterprise Guide Window Opening with a New Project



The numbers in Figure 1.2 identify the main areas of the SAS Enterprise Guide window.

- ❶ Menu bar. Everything can start from here. The menu bar is referenced throughout the book.
- ❷ Toolbars. See the “Toolbars” section.
- ❸ Workspace. This contains the Project Designer and any opened files. The Project Designer contains one or more process flow diagrams. See ❹.
- ❹ Task List. This lists all the tasks both by category and by name.
- ❺ Project Explorer. The name of the project is at the top. The elements of the project are listed below in project tree form. The default name of a new project is Project. This is changed to the name of the project file when the project is saved. The new project shown in Figure 1.2 contains an empty process flow diagram named Process Flow. See ❻.

By default the Task List window is unpinned (☐ or 🗑️). The window opens when the cursor is above its tab. It stays open as long as the cursor is over the window.

By default the Project Explorer window is pinned (📌 or 🗑️). The window opens with the SAS Enterprise Guide window and stays open.

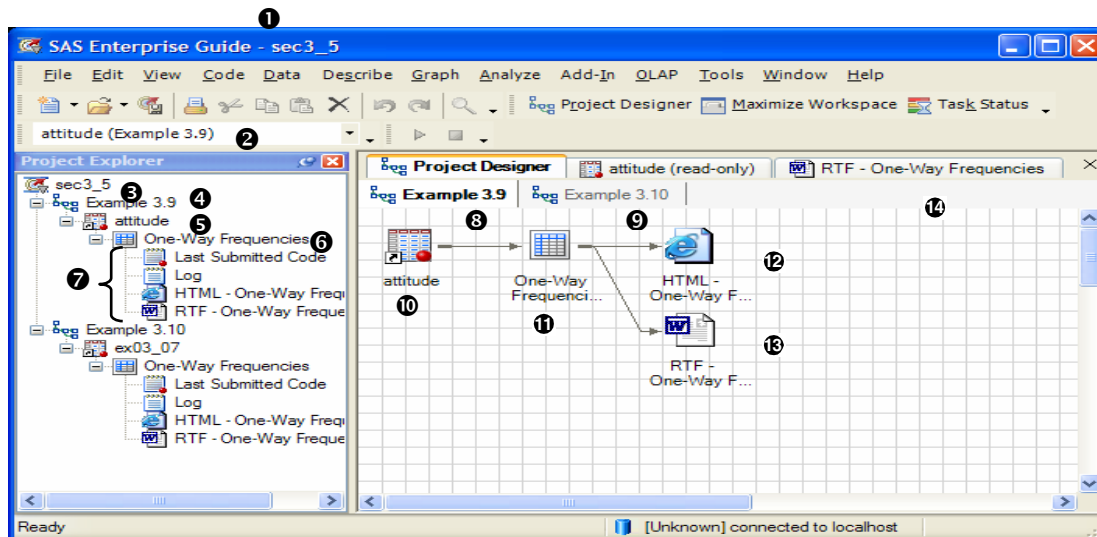
Clicking an unpinned icon changes the window to pinned. Clicking a pinned icon changes the window to unpinned.

- ⑥ A process flow diagram in the Project Designer. The name Process Flow is a default name and can be changed. A project can contain many process flow diagrams. These diagrams illustrate the contents, the connections, and the directions in the project.
- ⑦ Task Status. This shows the status of the underlying code as it is being executed.

1.1.3 Common Elements of Projects




This section uses Example 3.9 in Section 3.6 to present elements that are common in projects. Figure 1.3 shows the SAS Enterprise Guide window after completion of both examples in Section 3.5. The process flow diagram Example 3.9 is seen in the Project Designer.

Figure 1.3 SAS Enterprise Guide Window Applied to the Examples in Section 3.5



The numbers in Figure 1.3 identify elements of the current project.

- ① The project name sec3_5 in the title bar. The project file is sec3_5.egp.
- ② The active data set is Attitude on the Example 3.9 process flow diagram.
- ③ The project name sec3_5 at 📁 in the Project Explorer.
- ④ The icon 📁 indicates a process flow diagram. This section of Project Explorer is associated with the process flow diagram Example 3.9.

- ⑤ The icon  indicates a shortcut for a SAS data set. This shortcut is for the Attitude data set. The shortcut is also in the Example 3.9 process flow diagram.
- ⑥ The One-Way Frequencies task has been applied to the Attitude data set.
- ⑦ Files associated with running the One-Way Frequencies task:
 - Last Submitted Code is the underlying SAS code.
 - Log has the details associated with the task's execution.
 - HTML - One-Way Frequencies is the task output in HTML format.
 - RTF - One-Way Frequencies is the task output in rich text format.
- ⑧  Example 3.9 is the tab of the process flow diagram showing in the Project Designer.
- ⑨  Example 3.10 is the tab of a hidden process flow diagram in the Project Designer.
- ⑩ Attitude is the data source for the One-Way Frequencies task in the Example 3.9 process flow diagram.
- ⑪ The One-Way Frequencies task has been applied to the Attitude data set. The same output is in two files.
- ⑫ HTML - One-Way Frequencies is the task output in HTML format.
- ⑬ RTF - One-Way Frequencies is the task output in rich text format.
- ⑭ RTF - One-Way Frequencies tab in the workspace.

1.1.3.1 Opening a Data Set

Example 3.9 begins with opening the SAS data file Attitude on the local computer. A more general discussion is in Section 2.2.6, “Opening an Existing SAS Data File.”


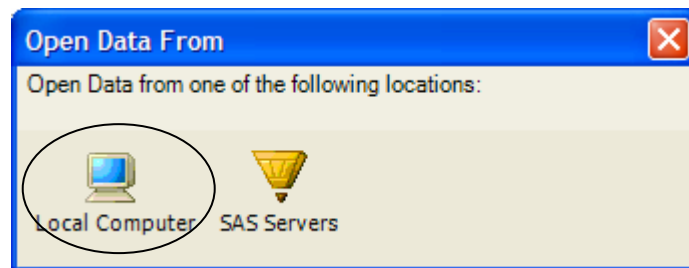
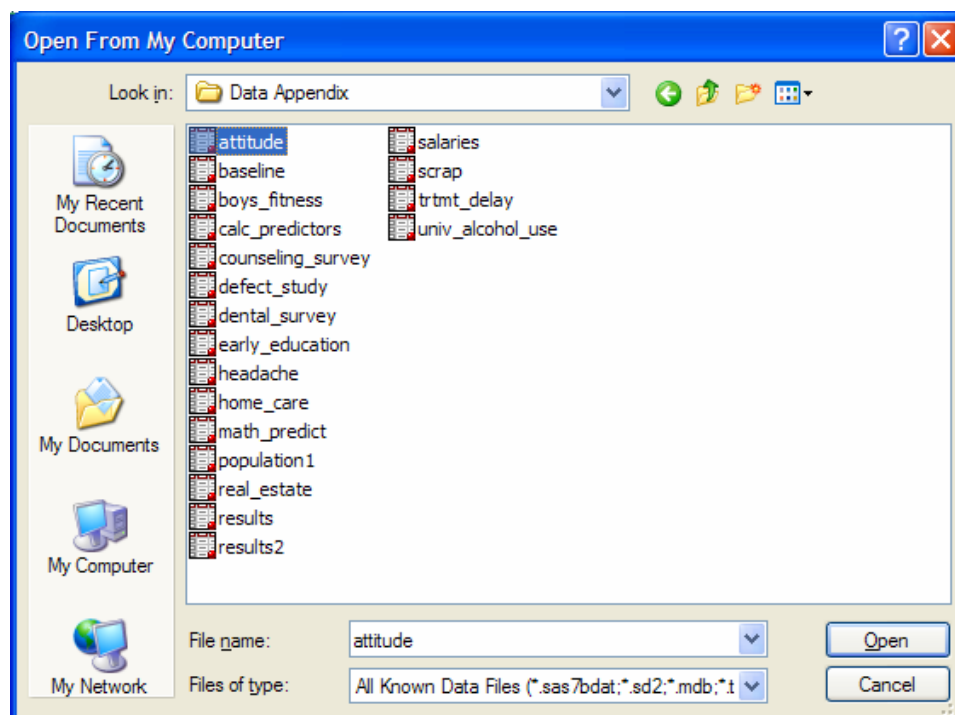
1. From the Standard toolbar, the Open icon () is selected.
2. Then **Data** is selected from the drop-down menu.
3. **Local Computer** is selected on the Open Data From window. See Figure 1.4.

Figure 1.4 Open Data from Window



4. The Open From My Computer window opens. In Figure 1.5, the author has navigated to the Data Appendix folder in his computer. The SAS data file Attitude is opened.
5. Labels and shortcuts for the SAS data file Attitude appear in the Project Explorer and Project Designer. See ⑤ and ⑩ in Figure 1.3.

Figure 1.5 Open from My Computer Window

1.1.3.2 Active Data

When a task opens, it uses the data set that is currently designated as the *active data set*. The name of the active data set is shown in the Active Data toolbar.

- See ② in Figure 1.3 and ④ in Figure 1.12.
- The toolbar shows Attitude (Example 3.9). The active data set is Attitude in the Example 3.9 process flow diagram.

To select a data set to be active:

- Click the example data set's icon on the Project Explorer or the Project Designer.
- Alternatively, select its name from the drop-down menu on the Active Data toolbar.

1.1.3.3 Project Designer and Process Flow Diagrams

The Project Designer contains the project's *process flow diagrams*. A process flow diagram (PFD) graphically represents:

- data sets, tasks, and results associated with the project
- relationships between these objects

A new project opens with one PFD named Process Flow. A PFD name can be changed. A project can have multiple process flow diagrams.

To change a PFD name:

From the Project Designer:

1. Right-click the name on the PFD tab identified by the PFD icon (📄).
2. Select **Rename** from the pop-up menu. The Rename window opens.
3. Enter the new name in the entry box. Click **OK**.

From the Project Explorer:

1. Right-click the name by the PFD icon (📄).
2. Select **Rename** from the pop-up menu. The name is in a box for editing.
3. Change the name. Press **Enter** on the keyboard or click a region on the screen outside the editing box.

To add a new PFD:

From the menu bar, select **File ► New ► Process Flow**.

From the Standard toolbar, select **Create New Item In Project ► Process Flow**.

From the Project toolbar, select **New Process Flow**.

Figure 1.3 has two process flow diagrams. See ❸ and ❹. They are named Example 3.9 and Example 3.10. The former is seen in the workspace.

- The Attitude data set (❶) is the data source for the One-Way Frequencies task (❷).
- The output of the task is in an HTML file (❸) and a Microsoft Word RTF file (❹). See Output 1.1 in the “Output” section.

1.1.3.4 Formats for Results

Results can be in five formats. See Figure 1.6. HTML, PDF, and RTF formats can be sent to external viewers. See Figure 1.7.

- **HTML:** This is the default format. HTML is the basic Web browser format. See the icon at ❸ in Figure 1.3. See Output 1.1 in the “Output” section.
- **PDF:** Portable document format opens with Adobe Acrobat Reader.
- **RTF:** Rich text format opens with Microsoft Word. See the icon at ❹ in Figure 1.3. The RTF output is in Output 3.7 in Section 3.6.2, “Task Output and Interpretation for Example 3.9.”
- **SAS Report:** A SAS format.
- **Text output:** Plain text format.

To select result formats and viewers:

From the menu bar:

1. Select **Tools ► Options**.
2. The Options window opens. Select **Results General** on the left. The Results General options are shown in Figure 1.6.
3. Check the desired formats.
4. HTML, PDF, and RTF can be viewed within SAS Enterprise Guide or in an external viewer. See the viewer options in Figure 1.7. The default is Enterprise Guide.
5. When finished, click **OK**.

Figure 1.6 Results General Options with HTML and RTF Selected

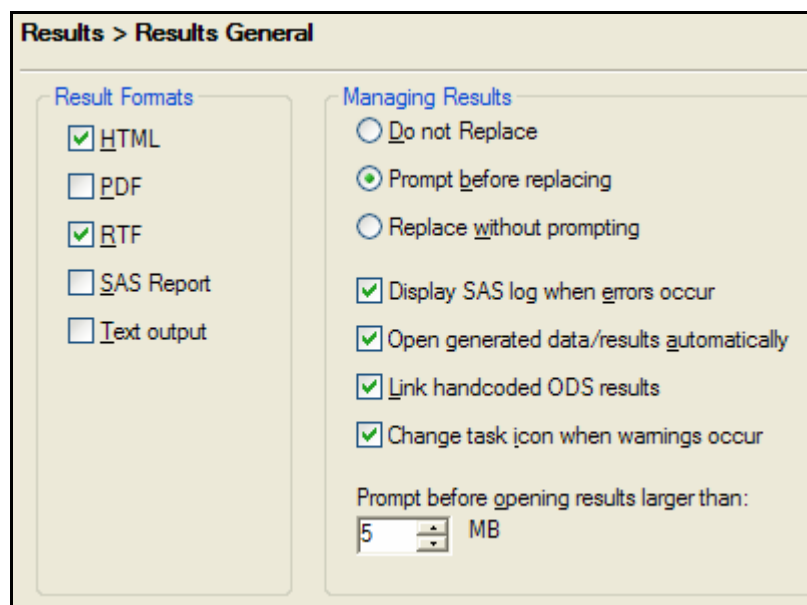


Figure 1.7 Viewer Options

The screenshot shows the 'Results > Viewer' dialog box in SAS Enterprise Guide. It is divided into three sections, each with a title and three radio button options. Below each section is a text input field and a 'Browse...' button.

- HTML Viewer:**
 - Enterprise Guide
 - Associated viewer: Internet Explorer
 - Preferred viewer
- RTF Viewer:**
 - Enterprise Guide
 - Associated viewer: Microsoft Word
 - Preferred viewer
- PDF Viewer:**
 - Enterprise Guide
 - Associated viewer: Acrobat Reader 5.0
 - Preferred viewer

1.1.3.5 Tasks

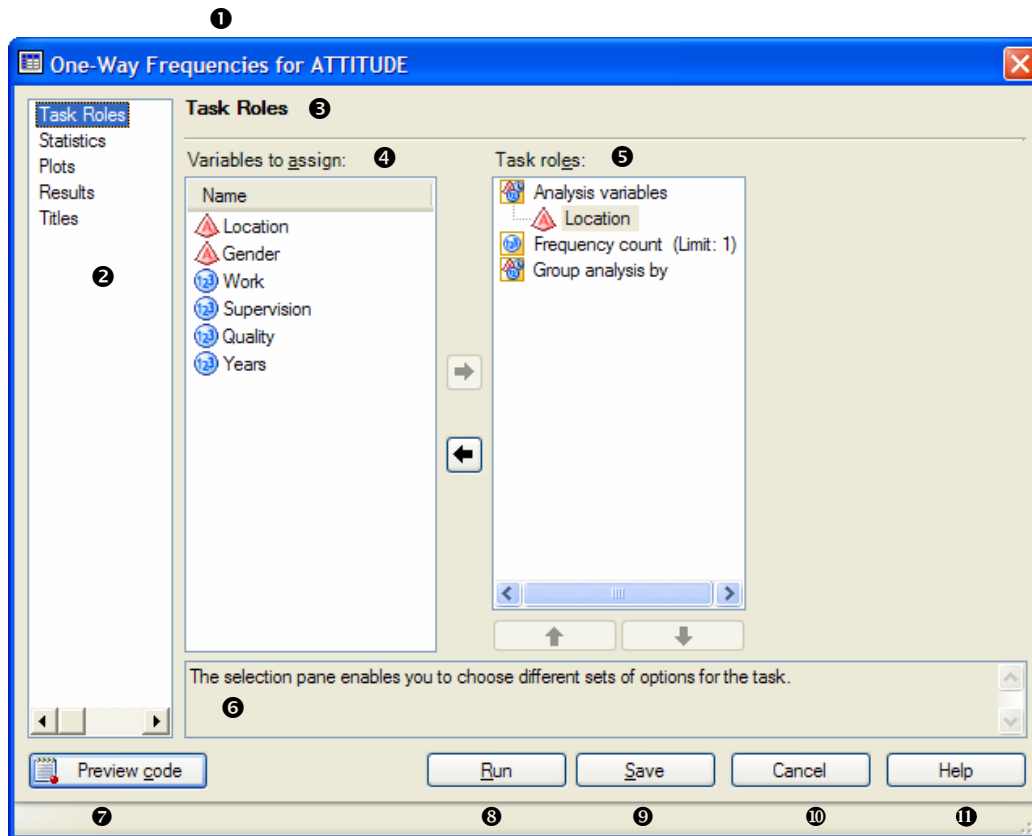
Almost all tasks have the same format as the One-Way Frequencies task shown in Figure 1.8.

- There is a selection pane on the left that lists groups of options. See ❷.
- Once selected, the group of options appears in the task window under the group title. See ❸.
- Help messages for items in the task window are shown beneath the options area. See ❹. This is discussed in the “SAS Enterprise Guide Help” section.

The Titles group of options is common to most tasks and is discussed in general in Section 1.2. It controls the titles and the footnotes in the task output.

The One-Way Frequencies task is discussed in Section 3.6.2, “Instructions for Creating Frequency Distributions with the One-Way Frequencies Task.”

Figure 1.8 One-Way Frequencies Task with Task Roles Showing



The numbers in Figure 1.8 identify elements of the One-Way Frequencies window that is showing the Task Roles options.

- ❶ Task name and data source in the title bar: One-Way Frequencies is being applied to the Attitude data set.
- ❷ Selection pane: **Task Roles** is selected.
- ❸ Title of options group: **Task Roles**.
- ❹ **Variables to assign** lists the variables in the data source. The red bell (🔔) indicates character data. The blue ball (🟦) indicates numeric data.
- ❺ **Task roles** lists roles appropriate for the task. A variable is assigned to a role by dragging it from **Variables to assign** to the role. A variable can be removed from a role by dragging back to the **Variables to assign** box. The arrows can also be used to assign and remove variables.

The roles Group analysis by, Frequency count, and Relative weight are common to many tasks. These are discussed in general in Section 1.2.2, “Common Task Roles.”

- ⑥ Help for items in the task window. Message in Figure 1.8 is for the selection pane.
- ⑦ **Preview Code** shows the underlying SAS code. New code can be inserted.
- ⑧ **Run** executes the task.
- ⑨ **Save** closes the task window and keeps changes. The task is not executed.
- ⑩ **Cancel** closes the task window without saving changes.
- ⑪ **Help** opens SAS Enterprise Guide Help for the current task options.

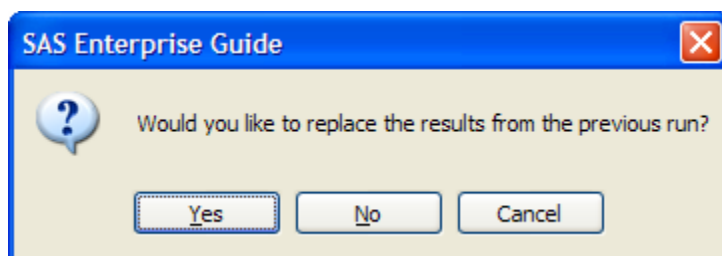
1.1.3.6 Repeating a Task

A task can be reopened, the options changed, and the task repeated. To reopen a task:

- Double-click the task icon in the Project Explorer or in the Project Designer.
- Or right-click the task icon in the Project Explorer or in the Project Designer. Select **Open** from the pop-up menu.

When a task is run or saved again, the window in Figure 1.9 asks how the results are to be handled.

Figure 1.9 Choices for the Results of a Repeated Task



The question is “Would you like to replace the results from the previous run?”

- **Yes** replaces the old output with the new output.
- **No** adds a new section in the Project Explorer and a new branch in the Project Designer for the repeated task and the associated files.
- **Cancel** returns to the task window.

1.1.3.7 Output

The output for Example 3.9 is in Output 1.1. It is in HTML format, which is the default format for results. The output in RTF format is in Output 3.7 in Section 3.6.3, “Task Output and Interpretation for Example 3.9.” Virtually all output in this book is in RTF format. When that is the case, titles are not repeated and the footnotes are dropped.

Output 1.1 Output for Example 3.9 in HTML Format

Enterprise Guide®

The Power to Know.

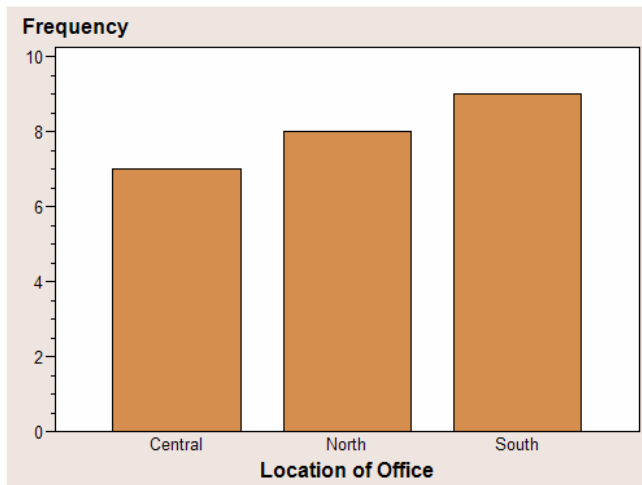
One-Way Frequencies Results

The FREQ Procedure

Location of Office				
Location	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Central	7	29.17	7	29.17
North	8	33.33	15	62.50
South	9	37.50	24	100.00

*Generated by the SAS System (Local, XP_HOME) on
19NOV2005 at 10:22 AM*

One-Way Frequencies Plots



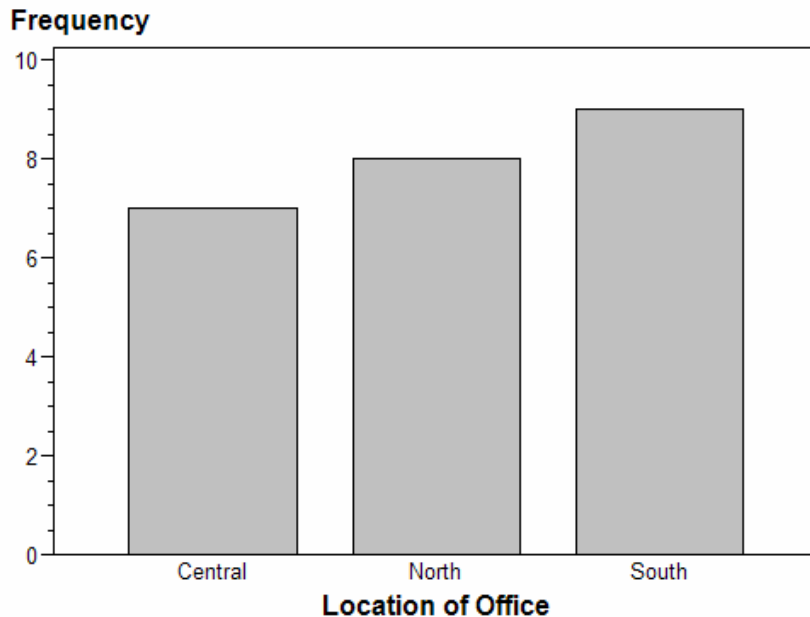
*Generated by the SAS System (Local, XP_HOME) on
19NOV2005 at 10:22 AM*

1.1.3.8 Simple Color Changes with Interactive Graphs

The background color and the color scheme of all the interactive graphs have been changed in this text. The ActiveX control and Java applet output formats are interactive.

The background color of the graph in Output 1.1 has been changed to white. The color scheme has been changed from custom to grayscale. The result is Output 1.2.

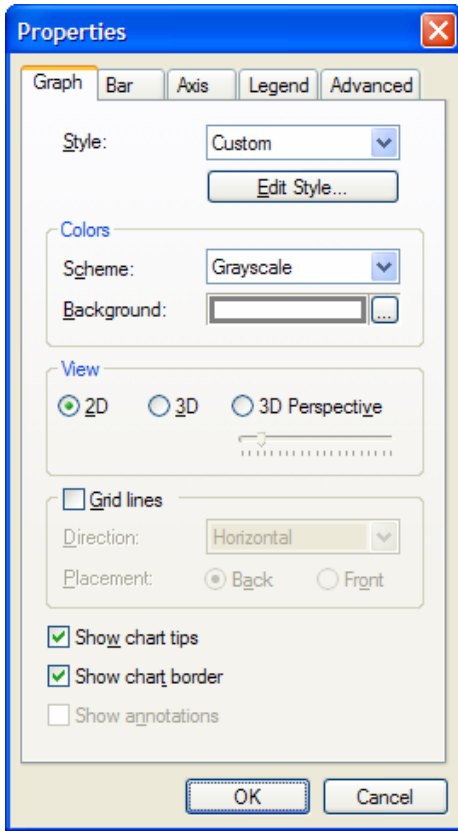
Output 1.2 Example 3.9 Graph with Grayscale Color Scheme and White Background



To change the color scheme and the background color:

1. Right-click the graph and select **Graph Properties** from the pop-up menu.
2. The Properties window appears.
3. The **Graph** tab is shown in Figure 1.10.
 - a. At **Scheme**, select the desired color scheme from the drop-down menu. **Grayscale** is selected in Output 1.2. See Figure 1.10.
 - b. At **Background**, click to open the Background color palette. Select the desired color. White is selected in Output 1.2. Click **OK** to return to the Properties window. The selected color is shown in the box to the right of **Background**.
4. Click **OK** when finished.

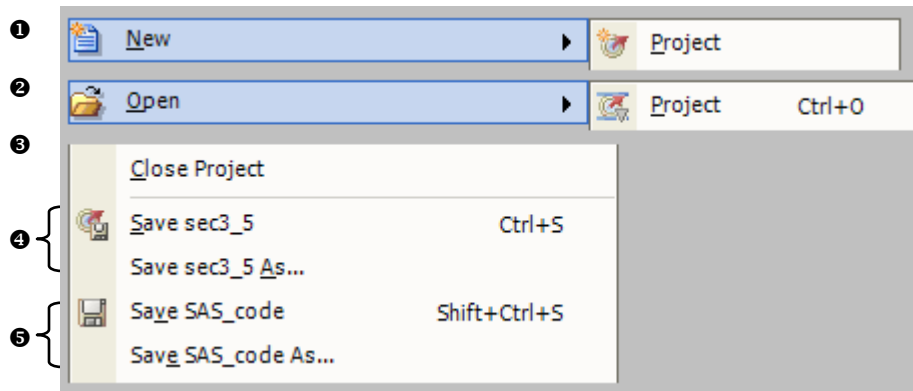
Figure 1.10 Properties Window for Interactive Graphs



1.1.4 Working with Project Files

Projects can be opened, closed, and saved on the **File** menu. Items ❶ through ❹ in Figure 1.11 are for projects. Item ❺ is not for projects. It is included here to help avoid confusion.

Figure 1.11 Project Items and Save Text Items on File Menu



The circled numbers in Figure 1.11 refer to the following:

- ❶ **New > Project** creates a new project. See Figure 1.2.

- ② **Open ► Project** opens an existing project. See the “Opening a Project” section below. Recent projects are listed near the bottom on the **File** menu.
- ③ **Close Project** clears the Project Explorer and the Project Designer. Opened files are closed.

If there are unsaved changes when any of the previous three items are selected, a window will appear asking whether changes are to be saved.

- ④ **Save *current-project-name*** saves the current project to the same file and location. **Save *current-project-name As*** is used to save the current project to a different file or location. See the “Saving a New Project or Saving a Project As” and “Saving the Current Project” sections below.
- ⑤ **Save *file-name*** and **Save *file-name As*** save SAS code files and other text files. The two items are inactive until such a file is selected.

A project takes on the name of its project file.

- In Figure 1.3 in the “Common Elements of Projects” section, the project name is sec3_5. See ① in the title bar and ③ at top in the Project Explorer.
- The project file is sec3_5.egp.

Project files can be opened from and saved to a Windows folder or a SAS Enterprise Guide binder.

- SAS Enterprise Guide is a Microsoft Windows client application. A project file is opened and saved in the standard manner.
- A SAS Enterprise Guide binder is a virtual folder corresponding to a folder on the computer or a server. For information about adding binders, refer to *SAS Enterprise Guide Explorer: User’s Guide*.

1.1.4.1 Opening a Project

Windows folder

1. From the menu bar, select **File ► Open ► Project**.
2. The Open Project window opens. Select **Local Computer**.
3. The Open From My Computer window opens.
4. **Files of type** is set to Enterprise Guide Project Files (*.egp).
5. Navigate to and open the desired file.

SAS Enterprise Guide Binder

1. From the menu bar, select **File ► Open ► Project**.
2. The Open Project window opens. Select **SAS Servers/Folders**.
3. The Open From SAS Servers/Folders window opens.
4. Select **Binders** on the left-hand side.

5. **Files of type** is set to Enterprise Guide Project Files (*.egp).
6. Navigate to and open the desired file.

1.1.4.2 Saving a New Project or Saving a Project As

Windows Folder

1. If saving a new project, select **File ► Save Project** from the menu bar or select the **Save Project** icon on the standard toolbar.
2. If saving as, select **File ► Save *current-project-name* As** from the menu bar.
3. The *Save current-project-name To* window opens. Select **Local Computer**.
4. The Save As window opens.
5. **Save as type** should be Enterprise Guide Project Files (*.egp).
6. Navigate to the desired folder and save the file.

Enterprise Guide Binder

1. From the menu bar:
 - a. If saving a new project, select **File ► Save Project**.
 - b. If saving as, select **File ► Save *current-project-name* As**.
2. The *Save current-project-name To* window opens. Select **SAS Servers/Folders**.
3. The Save To SAS Servers/Folders window opens.
4. Select **Binders** on the left-hand side.
5. **Files of type** is Enterprise Guide Project Files (*.egp).
6. Navigate to the desired binder and save the file.

1.1.4.3 Saving the Current Project

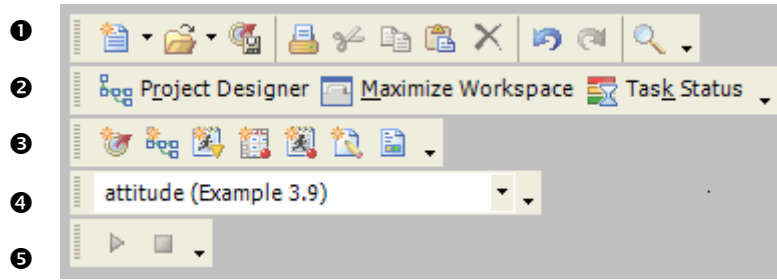
To save the current project to the same location:

1. From the menu bar, select **File ► Save *current-project-name***.
2. On the standard toolbar, select **Save *current-project-name***.

1.1.5 Toolbars

The four of the five toolbars shown in Figure 1.12 are alternatives to the menu bar. The exception is ④, the Active Data toolbar.

Figure 1.12 Available Toolbars



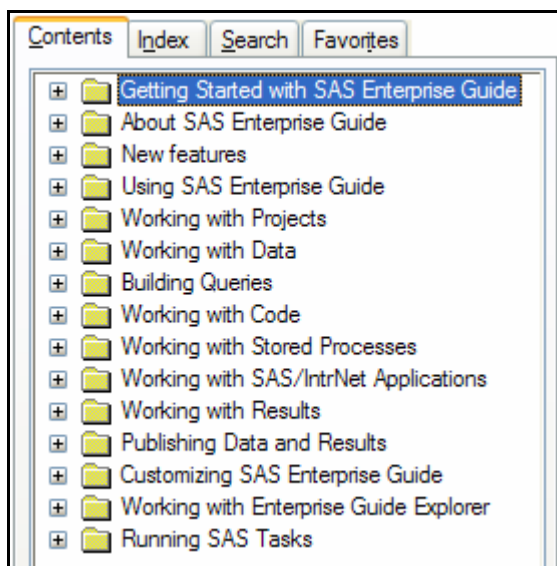
- ❶ Standard toolbar has icons that are also seen in the **File** and **Edit** menus.
 - First group:
 - **Create New Item In Project** and **Open** add objects to the project.
 - **Save *current-project-name***
 - Second group: **Print, Cut, Copy, Paste, Delete**
 - Third group: **Undo, Redo**
 - Fourth group: **Find** (to search for text in data files and code files that are opened in the workspace)
- ❷ View toolbar has icons that are also seen in the **View** menu.
 - **Project Designer** opens process flow diagrams in the work space. See Project Designer and Process Flow Diagrams in Section 1.1.3, “Common Elements of Projects.”
 - **Maximize Workspace** unpins and closes other windows.
 - **Task Status** opens the Task Status window.
- ❸ Project toolbar has icons that are also seen by selecting **File ► New: New Project, New Process Flow, New Stored Process, New Data, New Code, New Note, or New Report**. This toolbar is not automatically shown. To show this toolbar, select on the menu bar: **View ► Toolbars ► Project**.
- ❹ Active Data toolbar names the active data set. The active data set can be selected from the drop-down menu on the toolbar. Figure 1.3 shows Attitude (Example 3.9). The active data set is Attitude on the Example 3.9 process flow diagram. See Active Data Set in Section 1.1.3, “Common Elements of Projects.”
- ❺ Control toolbar ❺ has icons that are also seen in the **Code** menu. These are used when executing SAS code. The icons are Run and Stop.

1.1.6 SAS Enterprise Guide Help

SAS Enterprise Guide has a thorough Help capability.

- From the menu bar, select **Help ► SAS Enterprise Guide Help**. See Figure 1.13.

Figure 1.13 SAS Enterprise Guide Help



- The online SAS Enterprise Guide manual is available on the **Contents** tab.
- The Index, Search, and Favorites capabilities are available. Index and Search are based on a wide range of SAS manuals.
- **F1** on the keyboard provides context-sensitive help.
 - For example, the window in Figure 1.14 appears after you click on a process flow diagram and press **F1**.
 - SAS Enterprise Guide Help displays the appropriate page from the online manual. The page is highlighted on the **Contents** tab. In Figure 1.14, the page **About process flows** is discussed in the “Working with Process Flows” section of the **Contents** tab.
- **Help** provides help for the current task options. See ❶ in Figure 1.8 in the Tasks section. Clicking **Help** opens SAS Enterprise Guide Help to the appropriate page in the online manual. The page is also highlighted on the **Contents** tab.
- Help is shown in the task windows for specific options. See ❷ in Figure 1.8 in the Tasks section. Also see Figure 1.15 below. In Figure 1.15, the cursor is hovering over **Frequencies and percentages with cumulatives**.
- The What is ...? window describes selected options. In Figure 1.16, the cursor is hovering over **Maximize Workspace** in the View toolbar. To open this window, select **View ► What is**.
- The tutorial “Getting Started with SAS Enterprise Guide” is an excellent way to become familiar with SAS Enterprise Guide. It works through examples using data that is comes with the software. To start the tutorial, select **Help ► Getting Started Tutorial**.

Figure 1.14. About the Process Flow Window in SAS Enterprise Guide Help

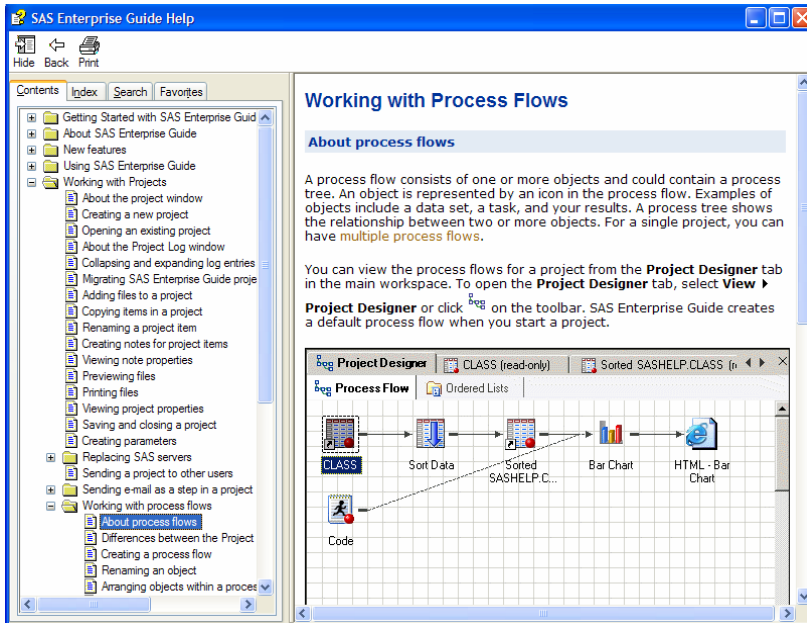


Figure 1.15 Statistics Options in One-Way Frequencies Task

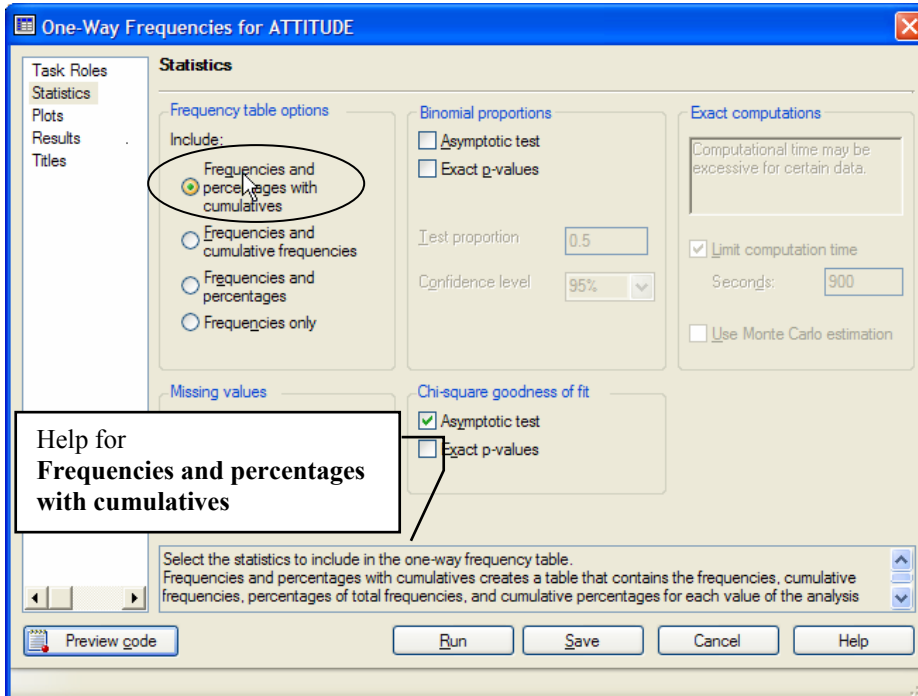
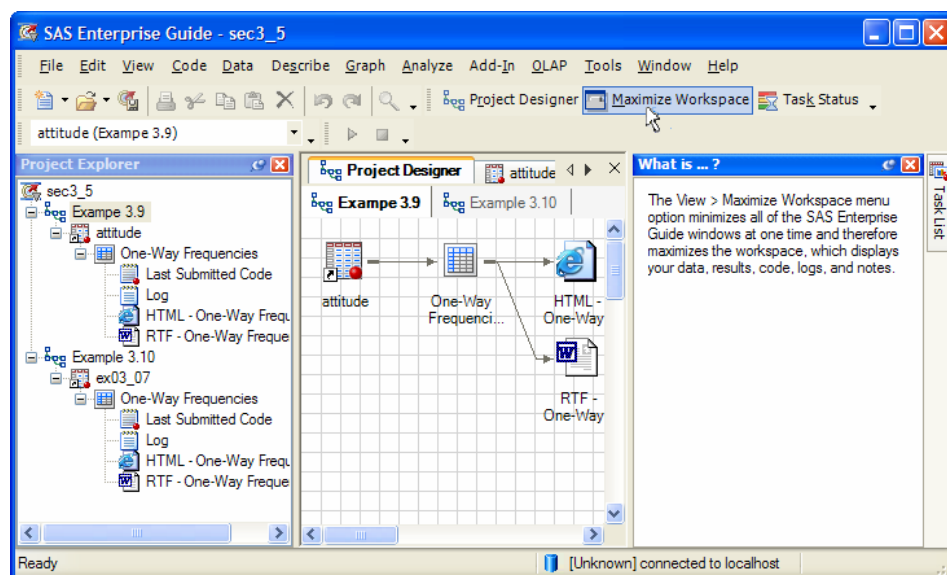


Figure 1.16 What is ... ? Describes Maximize Workspace on View Toolbar.

1.2 Titles and Common Task Roles

Instructions for most tasks refer back to this section. The Titles group of options is common and is discussed here. Three task roles that occur often are also discussed here.

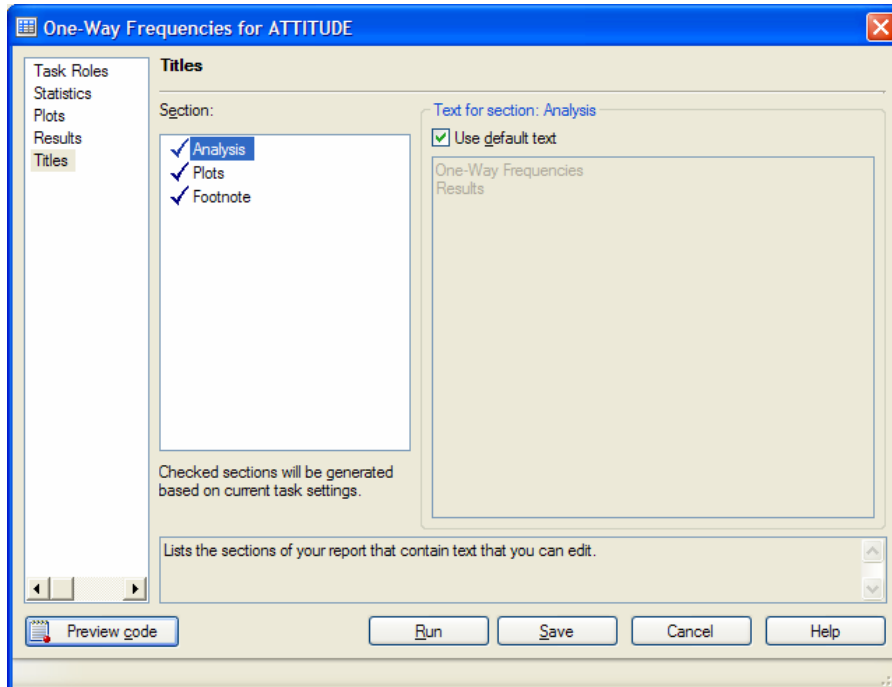
1.2.1 Titles

The Titles options are the same in each task. Figure 1.17 shows the Titles options for the One-Way Frequencies task.

- Section lists the possible sections of task output plus the footnotes. Checked sections are those being requested.
- Text for section: *item-name* corresponds to the item selected on the section list.
 - With **Use default text** checked, the default title or footnote can be seen in the inactive text box.
 - Clearing the check box makes the text box active. The title or footnote can be edited.

The default **Footnote** gives system information, date, and time. For example:

Generated by the SAS System (Local, XP_HOME) on 19NOV2005 at 10:22 AM

Figure 1.17 Titles Options in the One-Way Frequencies Task

1.2.2 Common Task Roles

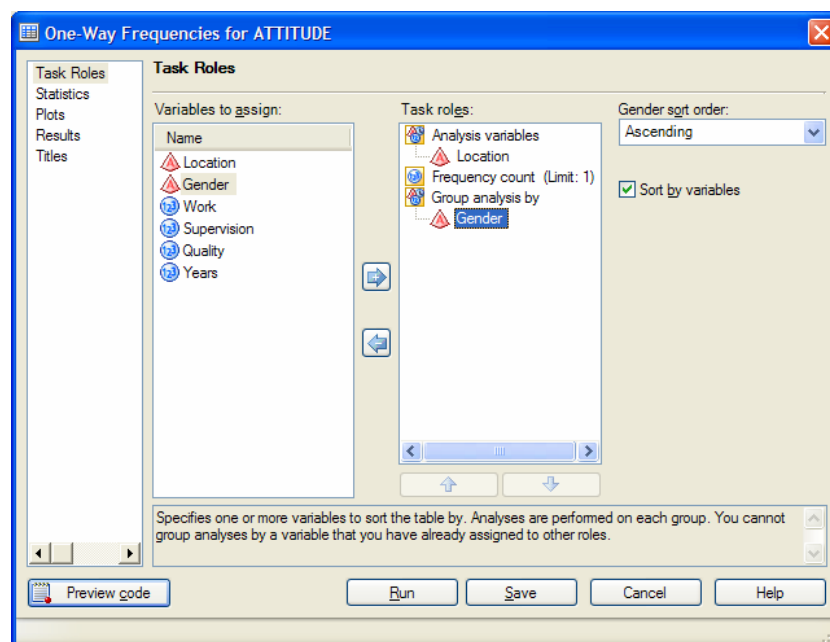
Group analysis by, Frequency count, and Relative weight task roles are fairly common and are discussed here.

- Group analysis by: Variables assigned to this role create groups of observations. All observations having identical rows in these variables form a group. The task is applied separately to each group. The task output is in a single file but there are separate results for each group.

In Figure 1.18, Gender is assigned to the Group analysis by role. The Gender values F and M create two groups in the analysis variable Location. The One-Way Frequencies task is applied separately to each group.

When a variable is assigned to this role, the variable's **sort order** drop-down menu appears. See Gender sort order on the right in Figure 1.18.

- The unformatted values may be sorted in ascending (the default) and descending order, if **Sort by variables** is selected.
- If **Sort by variables** is not selected, the groups are listed in the order that the values occur in the data.

Figure 1.18 Task Roles Options in One-Way Frequencies Task

- Frequency count: The rows of this variable list the frequencies that the respective observations occur in the sample. If no variable is assigned to the Frequency count role, all the frequencies are assumed to be 1.
- Relative weight: The rows of this variable list weights that the respective observations are given. If no variable is assigned to the Relative weight role, all weights are 1.