

# I Didn't Know SAS® Enterprise Guide® Could Do That!

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## ABSTRACT

This presentation is for users who are familiar with SAS® Enterprise Guide® but might not be aware of the many useful new features added in versions 4.2 and beyond. For example, SAS Enterprise Guide allows you to:

- Format your SAS source code to make it easier to read.
- Easily schedule a project to run at a given time.
- Work with OLAP data in your enterprise.

We will overview these and other features to help you become even more productive using this powerful application.

## INTRODUCTION

The main menu items in SAS Enterprise Guide 6.1, the current release, contain nearly 300 items and submenus. Many of these menu items control simple operations like "File Open" or "Delete." However, others are for complex operations such as analyzing your SAS code or creating project library definitions.

This paper highlights a few of these many features. Some features are from newer releases, but a few have been present for many releases. Our goal is to make you more aware of the breadth of functions provided, allowing you to more effectively use this very powerful tool.

We survey some of the top features in the following areas:

- General users
- SAS Programmers
- Data Analysts
- Content Consumers
- Content Creators

More detailed information about all of these items can be found in the online product documentation. You can read detailed information about the changes in each release by selecting the *Help* → *SAS Enterprise Guide Help* menu item and then selecting the "What's new in SAS Enterprise Guide" topic.

## SAS RELEASES

Recent SAS Enterprise Guide releases can communicate with multiple SAS server releases. The server releases that are supported for each release vary, as shown in Table 1.

SAS Enterprise Guide Release	Compatible SAS Server Releases
4.1	9.1.3
4.2	9.2
4.3	9.2 and 9.3
5.1	9.2, 9.3 and 9.4 (with SAS Enterprise Guide hot fix G35016 or later applied)
6.1	9.2, 9.3 and 9.4

**Table 1. SAS Server Releases Supported by Each Release of SAS Enterprise Guide**

You can use SAS Enterprise Guide 6.1 to access SAS 9.2, 9.3 or 9.4. It is not necessary to use the SAS Enterprise Guide release that was included with the Base SAS release being used. We recommend using the most recent release available that supports the SAS server release being accessed. By using the most recent release, you will have access to the most complete set of functions.

## TOP FEATURES FOR GENERAL USERS

The application contains several functions that are useful to all types of users, including:

- Process flow annotation using expanded notes
- Parallel execution of process flow branches on multiple workspace servers
- Local scheduling of SAS Enterprise Guide projects using automation
- Ad hoc creation of project library definitions
- Launching the ODS Graphic Designer to customize generated graphical results
- Selecting multiple output formats for generated results

### FEATURE 1 – PROCESS FLOW ANNOTATION

All releases have included note project items. One limitation in earlier releases is that note contents can be viewed only by opening the note. SAS Enterprise Guide 6.1 has added the ability to keep notes in an open state, providing a simple way to annotate complex process flows, as shown in Figure 1.

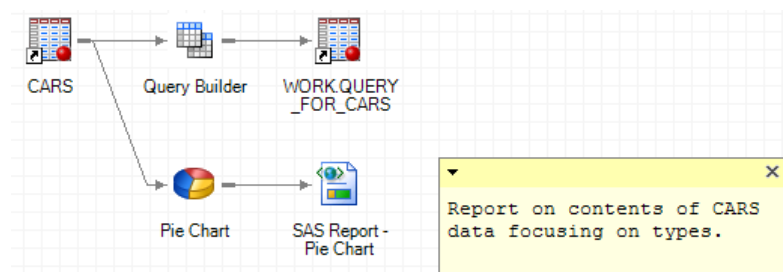


Figure 1. Process Flow Annotation Using Expanded Notes

### FEATURE 2 – PARALLEL EXECUTION OF BRANCHES

When a process flow is run, nodes are normally processed in order starting at the top of the process flow and progressing sequentially through the flow left to right, and then top to bottom. But only one node is processed at a time. SAS Enterprise Guide 5.1 introduced the ability to concurrently process independent branches. To do that, the application starts multiple client managed workspace servers. This client-managed workspace server pool should not be confused with the server-managed Pooled Workspace Server. The number of simultaneous workspace sessions that can be started as well as other parameters are controlled by a configuration file.

When the parallel execution feature is enabled, the application will start a workspace for each branch, subject to limits set in the configuration file. Then as each workspace becomes idle, the session is ended and removed from the pool.

There are some restrictions that can prevent parallel execution of branches. The primary restriction is that a branch cannot be executed in parallel if it references the Work library. Parallel execution is also unavailable when executing on an IBM z/OS server if the z/OS server is not configured to support client workspace pooling. The *SAS 9.4 Intelligence Platform: Desktop Application Administration Guide* documentation describes the configuration details required to enable client workspace pooling.

You can enable the parallel execution feature by accessing *File → Project Properties...* and setting the *Allow parallel execution on the same server* option on the Code Submission page to true. You can override the project level setting on a specific item by selecting the Properties dialog box for the task or program item and then using the controls on the Code Submission page.

### FEATURE 3 – PROJECT SCHEDULING AND AUTOMATION

The ability to schedule local execution of a project at a specific time has been available in many releases, and it has been made easier to use in SAS Enterprise Guide 6.1. The scheduling wizard now integrates with the Microsoft Windows Task Scheduler 2.0, allowing more flexibility in the triggers that cause execution to start.

You can select *File → Schedule Project* to launch the scheduler. When all settings have been specified, the application will create a simple VBScript file. When run, the script file will launch an SAS Enterprise Guide process and then run the project. The generated VBScript file uses the SAS Enterprise Guide automation interface to automate the execution of the project. The script can be customized using the many features in the SAS.EG.Scripting

namespace as described in the automation documentation available from the SAS Support website. The SAS Enterprise Guide 4.3 automation documentation also applies to SAS Enterprise Guide 5.1 and SAS Enterprise Guide 6.1.

The scheduler uses VBScript to access the automation object model, but other languages such as C#.NET can also be used to access the model for purposes other than scheduling (Hemedinger 2012). The automation model allows you to access data sets, code, and other items in the project and operate on them.

## FEATURE 4 – CREATING PROJECT LIBRARIES

The libraries associated with a SAS workspace server can be defined several ways. Some libraries can be predefined, meaning that the library is defined automatically when the workspace server starts, often by code inserted into a start-up script file. When a SAS® Metadata Server is being used with SAS Enterprise Guide, SAS libraries can be defined in metadata by using SAS Management Console or SAS Data Integration Studio. Although SAS Enterprise Guide contains limited support for defining libraries in metadata, SAS® Management Console or SAS® Data Integration Studio are the recommended tools for creating and manipulating library metadata.

The prior methods of defining libraries are typically performed by SAS administrators. You can define additional libraries that only exist for the duration of the workspace session by issuing SAS code containing one or more LIBNAME statements. SAS Enterprise Guide simplifies creating such ad hoc libraries by providing the Project Library Wizard on the Tools menu. You interact with the wizard to specify the library characteristics and the tool creates and runs the LIBNAME code. The wizard has been enhanced in recent releases to include support for newer library engines such as Greenplum, Apache Hadoop, HP Vertica, PostgreSQL, and the SASIOLA engine, which accesses data stored in the SAS® LASR™ Analytic Server.

You can specify LIBNAME options that are not listed as dedicated entry fields by entering the option on step 3 of the wizard, *Specify options for this library*. You can either enter the keyword and the value for the option in the grid, or you can enter the text to include in the LIBNAME statement in the *Additional Options* text field.

## FEATURE 5 – ODS GRAPHICS DESIGNER

The SAS ODS Graphics Designer is an external program that allows editing of ODS graphics, or .SGE, files. SAS Enterprise Guide 5.1 added the ability to launch the ODS Graphics Designer from within SAS Enterprise Guide. However, the ODS Graphics Designer required Base SAS to be installed on the client. Starting in the first maintenance release of SAS 9.4, the ODS Graphics Designer can be installed independent of Base SAS, will work with remote servers, and can still be launched from SAS Enterprise Guide.

To launch the Graphics Designer, select *Tasks* → *Graph* → *Open ODS Graphics Designer*. Then use the designer to customize and refine the output graphics as described in the ODS Graphics Designer documentation.

## FEATURE 6 – GENERATE RESULTS IN MANY FORMATS

SAS Enterprise Guide uses the Output Delivery System (ODS) to generate results. As such, it can generate results in many formats including:

- SAS Report (the format used by SAS® Web Report Studio)
- HTML (web format, readable by web browsers and many other programs)
- RTF (Rich Text Format, readable by many word processing programs)
- Portable Document Format (PDF, readable by Adobe Reader and other programs)
- Text output

You can select one or more formats to be used by default by program and task items in your project. You can also override the default settings for individual items in your project.

Select *Tools* → *Results* to choose the default output formats as well as customize how those formats are generated. The *Results General* page has settings that apply to all output formats, and the individual format pages can be used to customize the generation of a specific format. For example, Figure 2 shows the settings that customize how RTF (Rich Text Format) formatted output is created. You can specify additional options for the ODS RTF statement used to generate the output. Similarly, you can specify additional ODS options for each of the other destinations on the other details pages.

Override these default settings for a specific element by accessing the context menu for the item on the process flow and selecting *Properties*. The Results tab of the Properties dialog box is where you can select the output formats to

generate for the program or task. You cannot use this control to customize the options used to generate the output, but you can select which formats to generate. (Figure 3.)

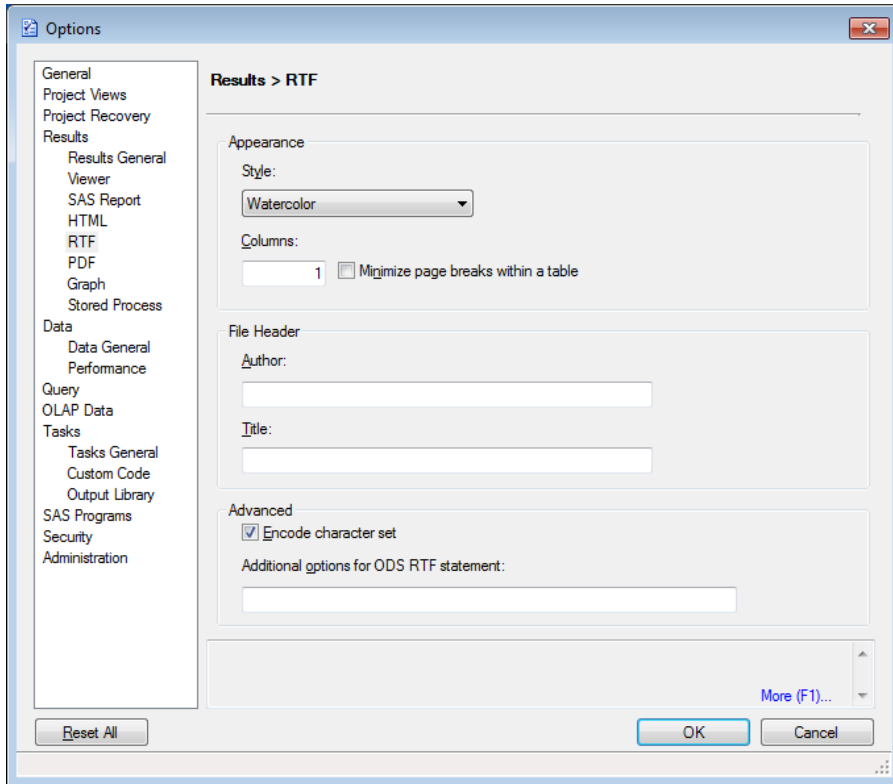


Figure 2. Using the *Tools* → *Options* Dialog Box to Specify Rich Text Format (RTF) Generation Options

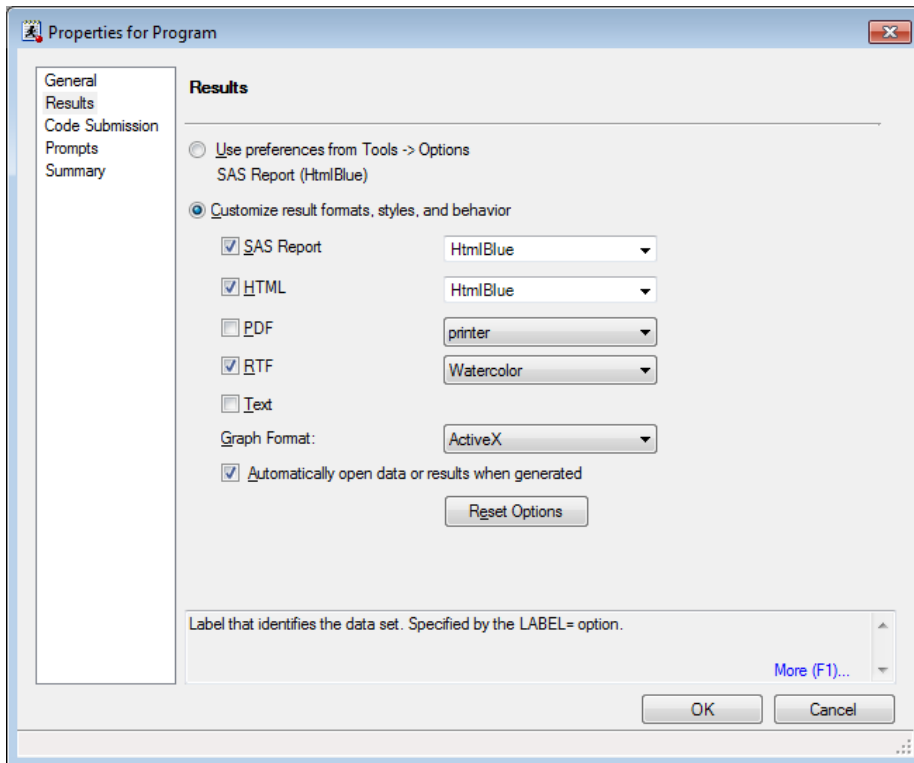


Figure 3. Specifying the Output Formats Generated by a Program Item

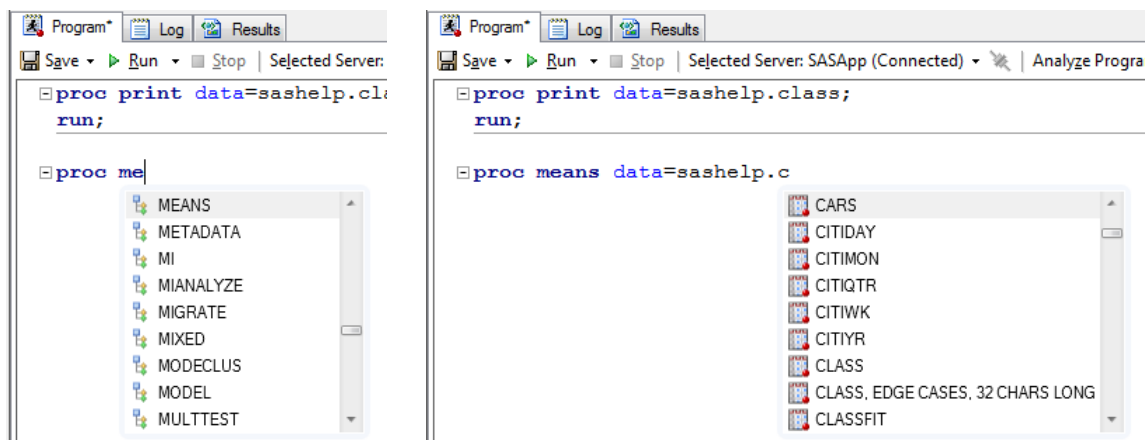
## TOP FEATURES FOR PROGRAMMERS

SAS Enterprise Guide contains many tools and features intended to facilitate efficient authoring of SAS program code. Many are part of the Enhanced Editor and are obvious, such as the syntax coloring. But other features such as code formatting, macros, and code analysis might be unfamiliar to some readers. This section surveys a portion of the code editing features that make SAS Enterprise Guide a powerful tool for creating and maintaining both simple and complex SAS programs, including:

- Autocompletion of SAS language elements
- Integrated SAS language syntax help
- Automatic code formatting
- Editor code macros and shortcut keys
- SAS code analysis for program flow, grid submission, and internationalization
- Log summary listing errors, notes, and warnings from the log

### FEATURE 7 – CODE AUTOCOMPLETION

Pop-up code autocompletion is provided as code is entered, showing the keywords that can be used at that point in the program. The prompt appears automatically while typing, and can be manually shown by pressing Ctrl + Spacebar. Other shortcuts are available as described in the application help. When the prompt displays, you can use the keyboard arrow keys to change the selected item and can use the spacebar to insert the selected item. As you type additional characters, the list of possible candidates is filtered, allowing you to rapidly enter code as shown in the left half of Figure 4.



**Figure 4. Autocompletion for Language Elements (left) and SAS Data Sets (right)**

Although showing language elements can be very useful, an even more powerful autocompletion function is showing available libraries, members, and column names. If there is an active connection to a SAS workspace server, then when the next program element is a library, member, or column name, the list of available items is retrieved from the server and then displayed, as shown in the right half of Figure 4. When columns are shown, the list is filtered to show the columns of the type required by the language element.

Position the mouse pointer over an item in the autocomplete list to display a window showing syntax summary for the item (Figure 5). This is a non-interactive version of the integrated syntax help discussed in the next section.

You can customize the autocomplete behavior on the *Autocomplete* page of the *Program → Editor Options* dialog box.

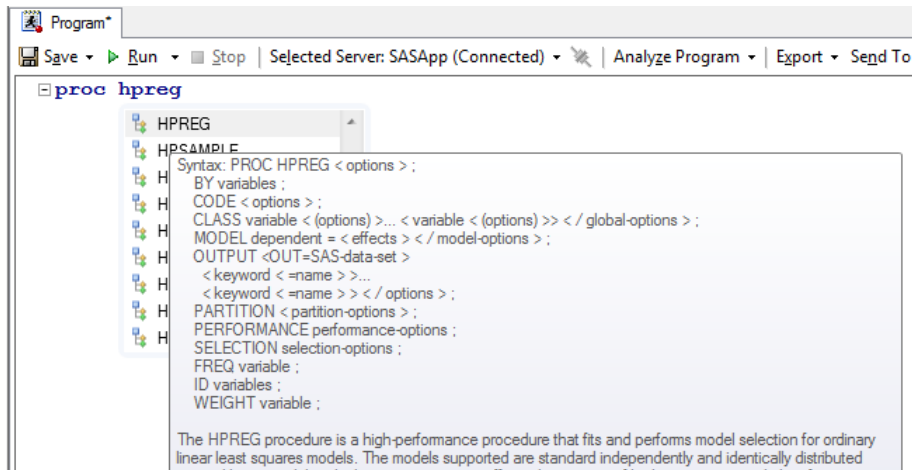


Figure 5. Syntax Help Popup for Item in Autocomplete List

## FEATURE 8 – INTEGRATED SYNTAX HELP

The autocompletion helps you determine the language elements that can be used at different points in your code, and the hover syntax help can aid in understanding the meaning and usage of language elements. The Integrated Syntax Help feature expands these concepts. If you press the F1 key while the cursor is within a SAS keyword or you position the mouse pointer over a keyword, a pop-up will display that contains syntax help for the keyword (Figure 6.) The window contains basic syntax help as well as links that can be selected to open a web browser window to the SAS Support website with search results for the product documentation entry for the keyword, samples, and SAS Notes pertaining to the keyword as well as papers concerning the keyword.

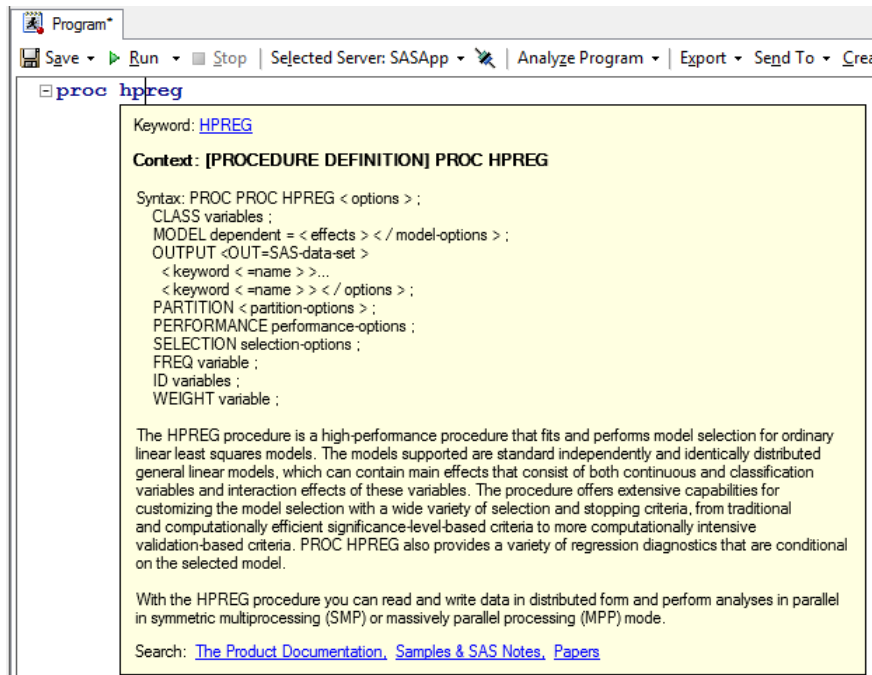


Figure 6. Syntax Help for PROC HPREG

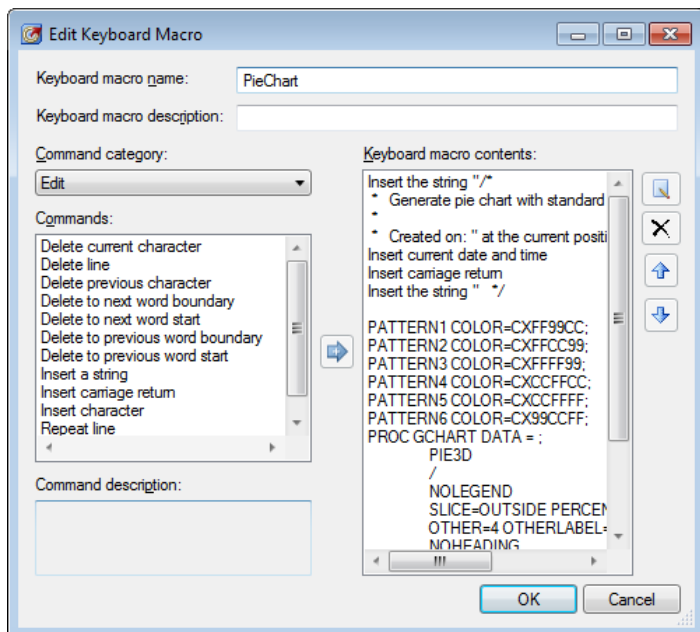
## FEATURE 9 – CODE FORMATTING

Once code is written, it can be useful to apply consistent formatting to it. The code formatting tool does this in a single step. You activate this function by either pressing Ctrl-I while in the code window, or selecting the *Edit* → *Format Code* menu item. The current code selection, or the entire file if nothing is selected, will then be formatted. The rules for how the formatting is applied can be customized on the *Indenter* page of the *Program* → *Editor Options* dialog box.

## FEATURE 10 – MACROS AND SHORTCUT KEYS

The Enhanced Editor offers many customization options. Three very powerful ones are Macros, Abbreviations, and Shortcut Keys.

A keyboard macro is a sequence of Enhanced Editor operations. You can create a simple macro by recording a series of operations. Then you can edit the macro to insert other editor operations. For example, you might record a macro that creates a documentation block and an outline of the code needed for a SAS Procedure. The macro might include commands like “Insert current date and time” and “Insert a string” where the string specified is a fragment of SAS code. When the macro is run, the documentation block is inserted with the current date specified and the code fragment is shown. Used in this way, macros allow for the creation of various code snippets to speed the coding process. Figure 7 shows an example of using a macro in this way. Notice how the code template is inserted in two blocks, with the current date and time inserted between them.



## Analyze for Grid Computing

The Analyze for Grid Computing function detects if a SAS Program is suitable for execution on the SAS Grid. When the program is analyzed, appropriate grid setup macros are inserted into the code. After the analysis completes, you can save the grid enabled code to a new code node by clicking the *Add to project* button.

## Analyze for Internationalization

The Analyze for Internationalization function detects if the SAS Program contains embedded strings, concatenated strings, or other language elements that can cause issues when the program is executed on a Workspace Server that is executing in a different locale than the one used when the program was created.

## FEATURE 12 – LOG SUMMARY VIEW

Each process flow item that runs code on the SAS workspace server has an associated log file. Releases prior to 6.1 display the log file with notes, warnings, and errors color coded. However, the log file that results from executing a complex SAS program can be very long, making finding problems in the log and the corresponding source code a tedious process. The Log Summary View, introduced in SAS Enterprise Guide 6.1, greatly simplifies this task by listing all Notes, Warnings, and Errors in a list. You can quickly navigate from the list to either the nearest source code line or to the pertinent line in the log. You can use other context menu items to quickly search the SAS Support website for articles that pertain to the Note, Warning, or Error. Figure 8 shows the Log Summary for a program that generated 2 Errors, 1 Warning, and 3 Notes. The Notes are not shown, as indicated by the toggled Notes button.

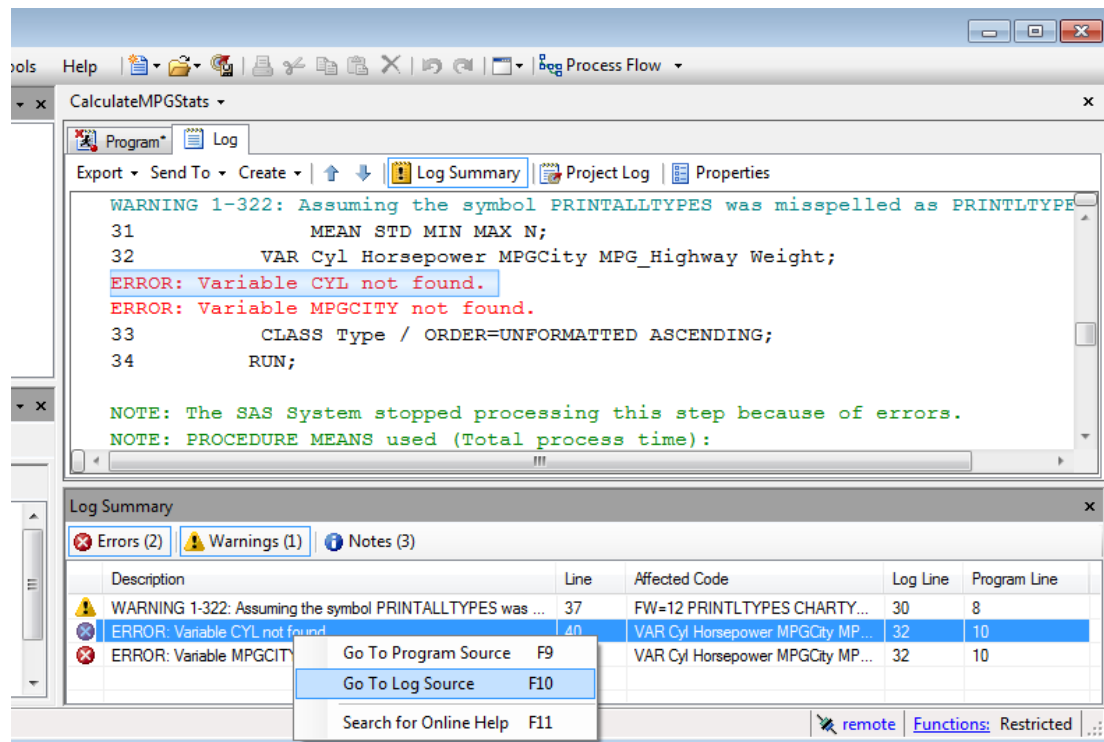


Figure 8. Log Summary with Warnings Hidden

## TOP FEATURES FOR THE DATA ANALYST

Consumers of data can take advantage of several features for accessing and using external data sources, including:

- Built-in tasks and custom tasks.
- Filtering and Query tools.
- The OLAP Analyzer.



## FEATURE 13 – TASKS: BUILT-IN AND CUSTOM

SAS Enterprise Guide 6.1 contains approximately 90 built-in tasks. These provide point-and-click interfaces to a variety of analytical procedures ranging from simple PROC PRINT code to more complex PROC TABULATE code. For novice users, or users who are learning SAS programming, the built-in tasks are a quick way to generate functional SAS programs. If further customization is required, the generated code can be opened in a stand-alone code node and edited. The edited code is then independent from the task.

An even more powerful function is the ability to extend the SAS Enterprise Guide user interface through the use of Custom Tasks. A Custom Task is a set of classes implemented in C# or Visual Basic which interact with the EG application through a set of well-defined interfaces. The best reference for creating custom tasks is the excellent book, “Custom Tasks for SAS Enterprise Guide Using Microsoft .NET” (Hemedinger 2012). By using Custom Tasks, you can extend SAS Enterprise Guide with tasks customized for your specific business needs. Creating a Custom Task can be complicated, but the result is a highly customized user experience.

SAS Enterprise Guide also supports Task Templates. A Task Template is effectively a task with custom default values set for the various options. To create a template, you first create a new task and set the options you need on the different pages. Then select the drop-down arrow on the *Run* button and select *Create Template* to show the Create Task Template window, as shown in Figure 9. No role assignments will be saved in the template.

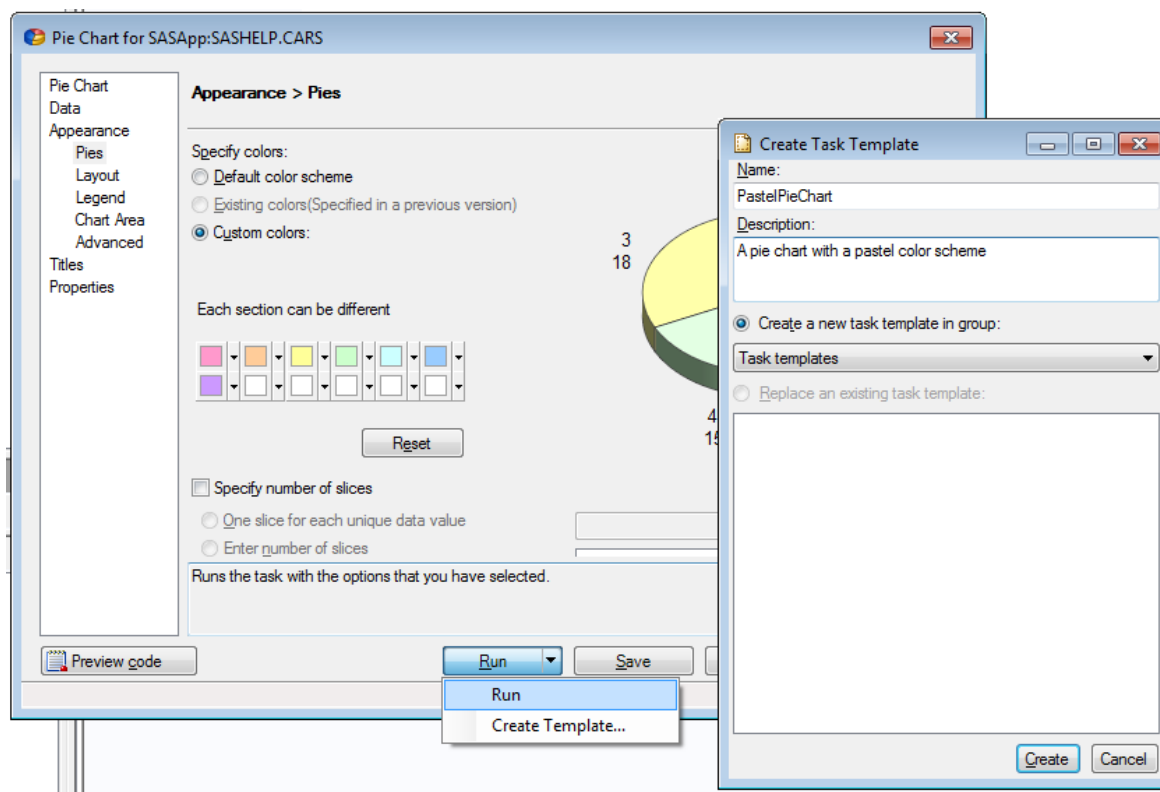


Figure 9. Creating a Task Template

The new template will appear as a sub-item on the Task Templates menu in the Tasks menu. When you invoke the template from the menu, the task dialog box will open with the various controls set to the values in use when the template was created.

## FEATURE 14 – SEVERAL WAYS TO FILTER AND QUERY DATA

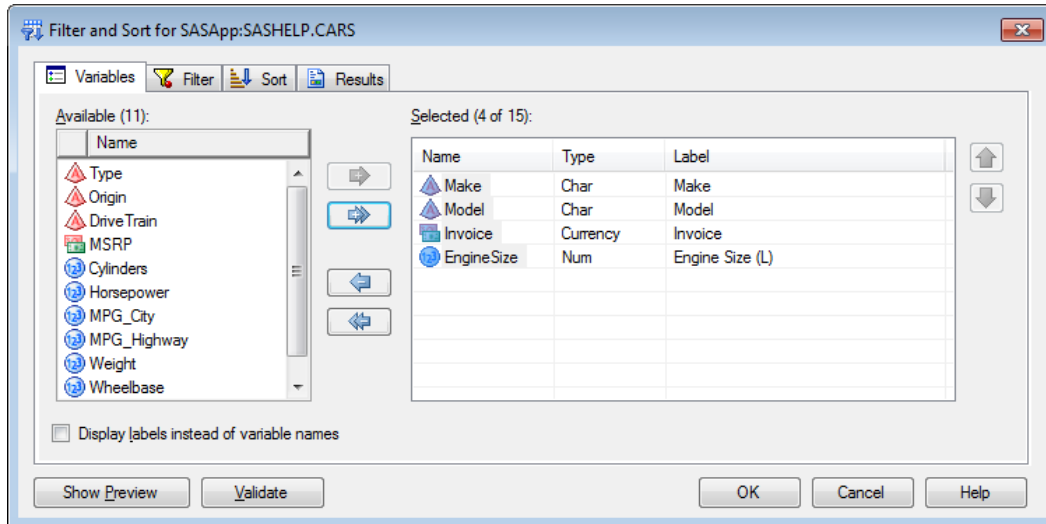
SAS Enterprise Guide provides three related tools for manipulating data:

- Data Filter and Sort – The Filter and Sort window is the simplest querying tool. It allows very simple data filters to be defined.
- Data Exploration – the Data Explorer allows interactive development of more complex filter conditions without having to add the data to the project. When the data constraints are completed, it can generate a Query Builder node in the Process Flow.

- Query Builder – the Query Builder is the most powerful tool for filtering data. You can use it to perform joins on data sets and create computed columns. SAS Enterprise Guide 5.1 added the ability save templates for queries, which can be used to define sub-queries. Sub-queries can be used as input to other queries.

### Filter and Sort

The Query Builder has been a powerful querying tool in SAS Enterprise Guide for many releases, but it provides many more options than are required in many situations. You can use the simpler Filter dialog box when only a simple value filter is needed. To access it, either click *Filter and Sort* on the data grid view specific toolbar, or select *Tasks → Data → Filter and Sort* from the main menu bar. The Filter dialog box shown in Figure 10 will display.



**Figure 10. A Sample Filter and Sort Dialog Box.**

The various controls allow simple variable selection, filtering, and sorting to be applied to the data. You cannot use this tool for more complex operations.

### Data Exploration

The Data Explorer, Figure 11, allows the contents of multiple data sets to be examined without actually inserting the data set into the current process flow. Filter and query criteria are interactively defined and simple statistics and exploratory graphical output can be generated. The data can then be added to the active process flow as a Query Builder node.

To open a new data set in the Data Explorer, either select *File → Open → Data Exploration*, or click the *Add* button at the top of the Data Exploration History panel. The standard File dialog box will display so that you can select a data set. The Data Exploration History panel in the Resources pane is a container for data sets which have been selected for exploration. Double-click any data set listed in the panel to open it.

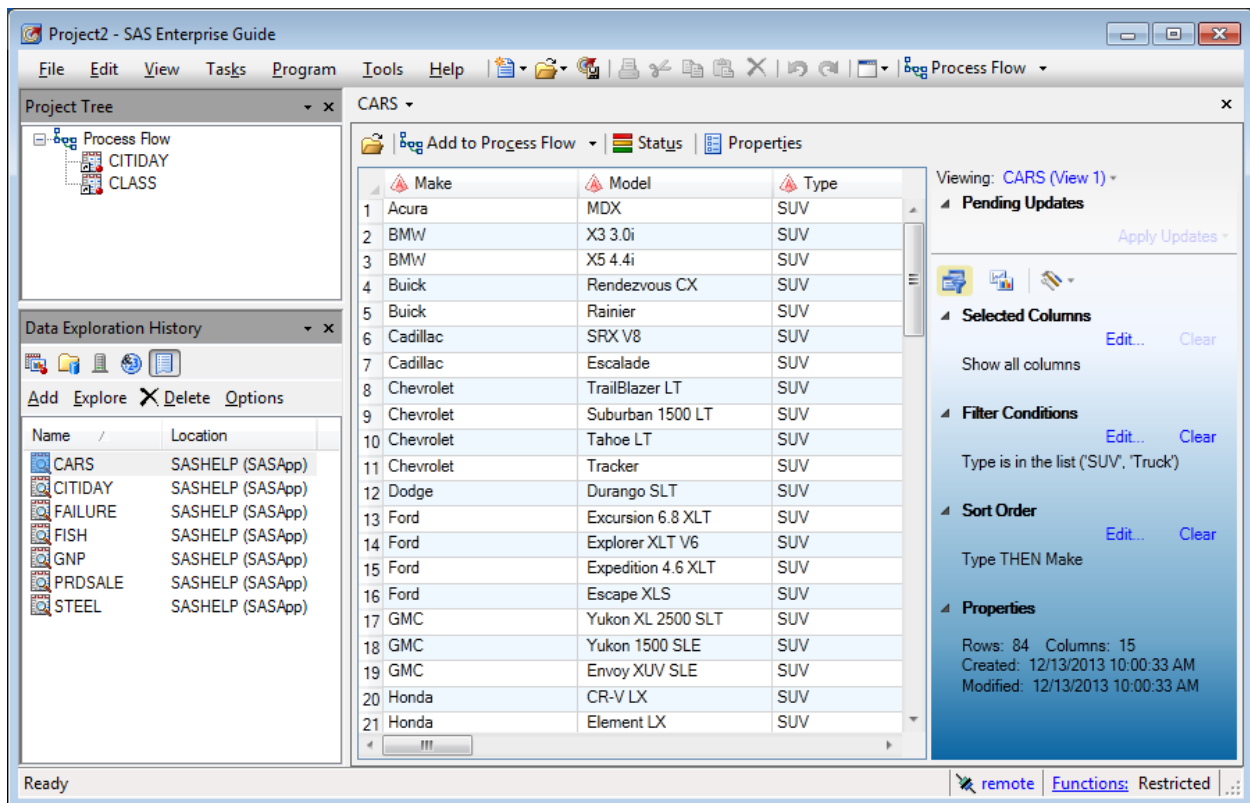


Figure 11. Data Exploration History with Five Data Sets in the History and SASHELP.CARS Open

The Data Explorer looks very similar to the main SAS Enterprise Guide data grid, but unlike the data grid, the Data Explorer is read-only. Cell values cannot be modified in the Data Explorer. In Figure 12, the “Type” column heading has been clicked and a column value selector is shown. By selecting different column values, a filter condition can be created that will apply to that column. The sort header can also be clicked so that sort order can be modified. Clicking *Close* dismisses the selector panel and leaves the condition in the list of pending changes. After several conditions are specified in this way, the set of pending changes is applied to the data set by clicking the *Apply Updates* button in the side panel.

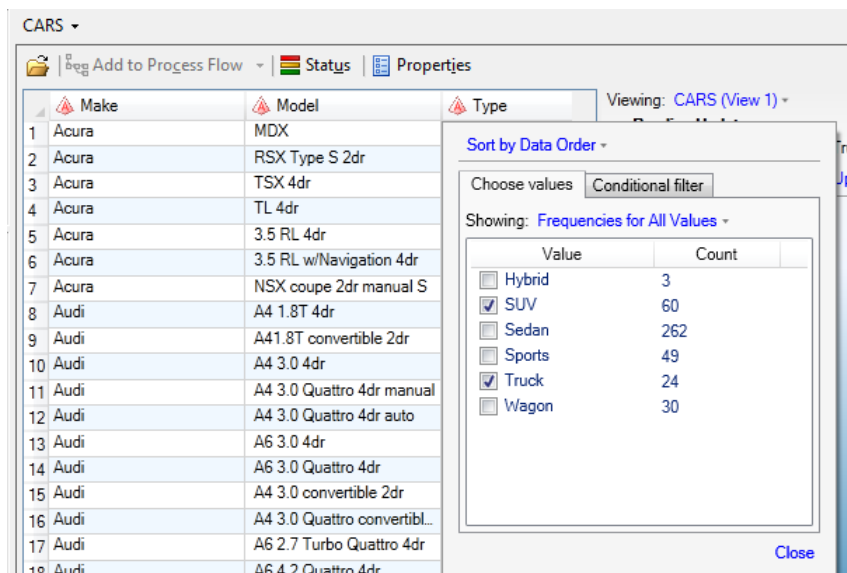
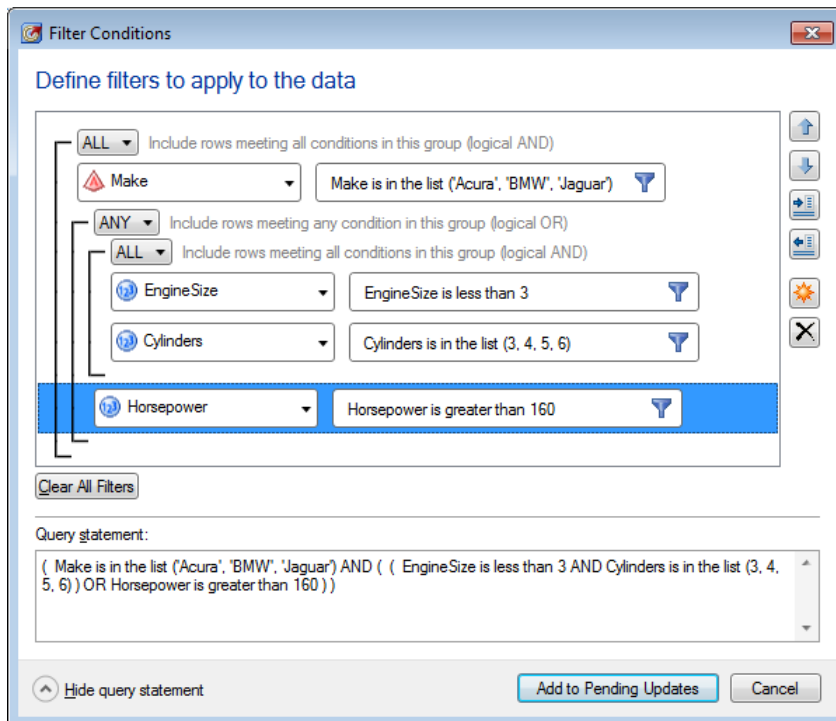


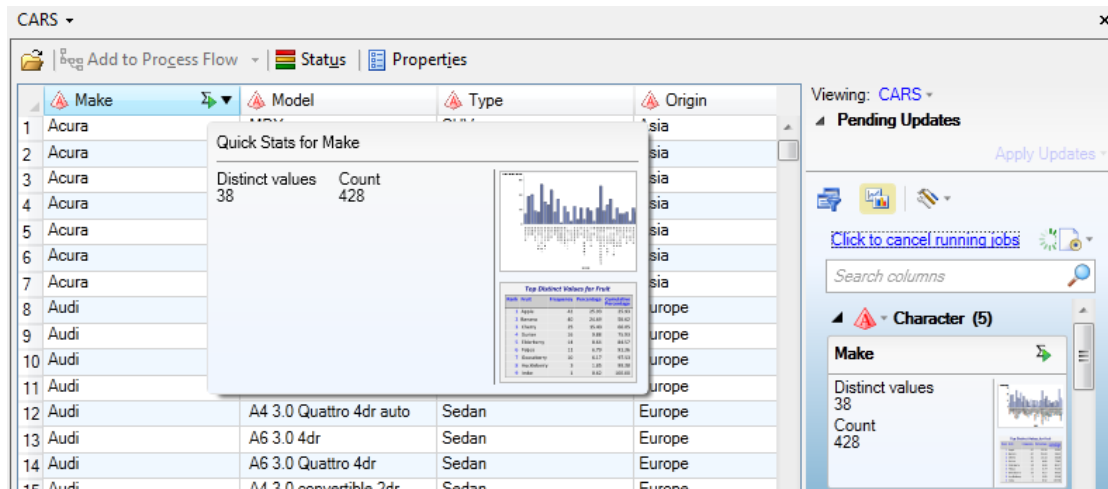
Figure 12. SASHELP.CARS Data Opened in the Data Explorer

More complex conditions can be specified by using the *Selected Columns*, *Filter Conditions*, and *Sort Order* sections of the Data Explorer side panel. For example, the Filter Conditions dialog box allows nested conditionals to be created with the nesting levels depicted by grouping brackets (Figure 13). When using the Filter Conditions dialog box, it can be more efficient to first define all the conditions, and then group them using the indent and move buttons.



**Figure 13. The Filter Conditions Dialog Box**

You can also click on the summary icon on the right side of a column heading to access simple statistics and graphs for the column. More information is provided on the statistics tab, as shown in Figure 14.



**Figure 14. Detail of the Data Explorer Showing Pop-up Quick Statistics and the Statistics Pane**

After the data is in the desired state, click *Add to Process Flow* in the right panel (see Figure 11) to create a Query node that is populated with the filtering criteria defined in the Data Explorer.

The Data Explorer relies on the client workspace pooling logic that is also used for Feature 2 “Parallel Execution,” and the same constraints described in that section apply here. Data sets in the Work library cannot be open in the Data Explorer, and z/OS Workspace servers must be configured properly.

## Query Builder

The Query Builder is the most powerful and complex tool in SAS Enterprise Guide for creating SQL views of data sources. Unlike the Filter and Sort dialog box and the Data Explorer, you can use the Query Builder to join multiple data sets and define computed columns. The product documentation explains the full set of functions. We focus on one recent enhancement: Query Templates with Sub-Queries.

Similar to Task Templates discussed earlier, a Query Template is effectively a pre-filled query definition. As long as the input data has column names that map to the column names in the template, the template settings will be applied. The template can then be used as a sub-query on another query definition, creating a nested SELECT statement in the generated SQL code. This is a complex feature that can be very useful in certain situations. In summary:

- Queries can be saved as a Query Template, very similar to how a Task Template is created.
- Query templates are listed in *Tasks* → *Task Templates* menu alongside any defined Task Templates.
- Task Templates and Query Templates can be exported and imported, allowing sharing between users.
- A Query Template can be used as a part of a filter condition in another query to form a sub-query, if the template has a single result item that might return single or multiple values.

For example, the SASHELP.CLASS data set has observations of student height, weight and age values. A query template can be created that computes and returns the average weight. That template can be used as a sub-query to filter the values to include only observations with weights below the average. The resulting SQL code will contain a WHERE clause formed from the Query Template. (Burke 2012.)

## FEATURE 15 – OLAP DATA

OLAP Data can be loaded from a SAS® OLAP Server as defined in the active metadata server, or an ad hoc connection can be made to SAS or other OLAP servers if the appropriate data providers are installed. To create an ad hoc connection, select *File* -> *Open OLAP Cube*, and then select the connect button on the toolbar as shown in Figure 15. The OLAP Server Definition dialog box will be shown. Then enter the information for the Server Name, which will be shown in the Private OLAP Servers collection, the host name, provider, and other information. If you select *Specify provider specific options*, then the provider's connection dialog box will display.

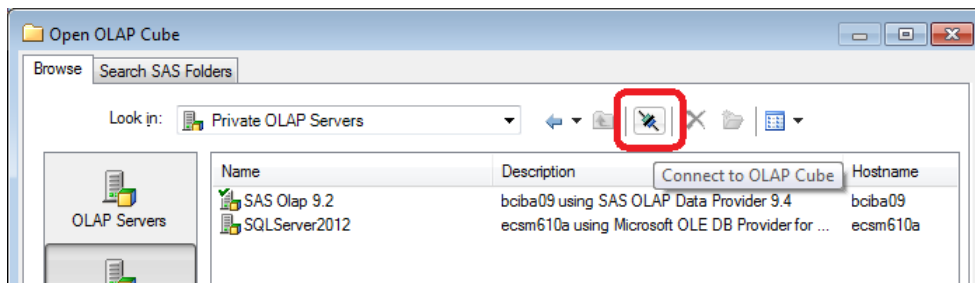


Figure 15. Accessing the Connect to OLAP Cube Dialog Box to Create an Ad-hoc Connection

After defining an ad hoc connection, the connection will be shown in the Private OLAP Servers group in the Server Panel of the Resources pane. Similarly, servers defined in metadata are shown in the OLAP Servers group. Figure 16 shows the Server panel with both a SAS OLAP server and several ad hoc Private OLAP Servers shown.

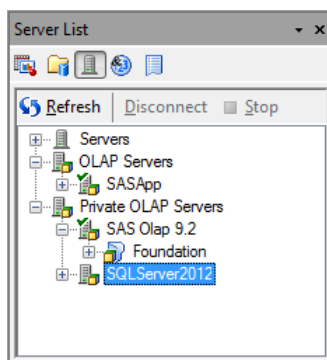


Figure 16. Viewing Registered SAS OLAP Server and Ad-hoc Private OLAP Server Definitions

## TOP FEATURES FOR THE CONTENT CREATOR AND CONSUMER

SAS Enterprise Guide can be used to create Stored Processes from existing code nodes or from a task. It can also consume SAS Reports and Stored Processes. All of these functions only work if SAS Enterprise Guide is connected to a SAS Metadata Server.

### FEATURE 16 – CREATE AND MODIFY STORED PROCESSES

You can use SAS Enterprise Guide to create Stored Processes and register them in SAS Metadata so that they can be consumed by other products such as the SAS® Add-In for Microsoft Office. You can also modify an existing stored process if you have permission to do so.

There are several ways to create a new stored process:

- You can create a stored process from a program node in your project. Select *Create* → *Stored Process* from the menu bar on either the Program tab or Log tab of your program. You can also access the context menu for the Program icon on the process flow and selecting the “Create Stored Process” menu item. The Stored Process Wizard will be prepopulated with the code in the program.
- You can create a Stored Process from a task in your project. Select *Create* → *Stored Process* from the menu bar on the Code tab or Log tab of the task. You can also access the context menu for the Task icon on the process flow and selecting the “Create Stored Process” menu item. The Stored Process Wizard will be prepopulated with the code generated by the task.
- You can select *File* → *New* → *Stored Process*. The Stored Process Wizard will not contain any code, and you can enter the code to use on page 3 of the wizard, “SAS Code.”

In all three methods, the Stored Process Wizard will display. Proceed through the pages to define the Stored Process:

- Page 1 is where you specify the metadata information for the Stored Process, including keywords and responsibilities. If the check box labeled “Make 9.2 compatible version” at the bottom of the page is not checked, then features added in SAS 9.3 are available. These features include making the stored process hidden and storing the code in metadata instead of in a linked file.
- Page 2 is where you specify the SAS code. You can use the “Replace with code from” drop-down list to select a code file from your local computer, from a SAS workspace server, or from items in the current project.
- Page 3 is where you specify how the code is stored and executed. The options available differ depending on whether the 9.2 compatible was selected on Page 1.
- Page 4 is where you to specify any prompts that your code needs. These prompts are metadata prompts, which are different from the SAS Enterprise Guide project prompts. Project prompts cannot be used in a stored process. The two prompting systems are distinct.
- Page 5 is where you specify data sources and targets for the stored process.
- Page 6 is where you review a summary of the settings that will be applied when the wizard is finished.

If you have adequate permissions, you can also use SAS Enterprise Guide to modify an existing stored process. You must first insert the stored process into the project by opening it. Then, access the context menu for the stored process item and select *Modify*. Alternately, you can first run the stored process, and then select *Modify Stored Process* on the Results tab.

### FEATURE 17 – VIEW AND CREATE SAS WEB REPORT STUDIO REPORTS

SAS Web Report Studio is the reporting component of the SAS® Business Intelligence suite and can be used to generate reports that are then accessed through SAS Folders or saved as external files. SAS Web Report Studio reports are shown in the File dialog box and in the SAS Folders pane as “Report” files. In contrast, SAS® Visual Analytics reports, discussed next, are shown as “Report (2G)” files.

In addition to consuming reports created in SAS Web Report Studio, you can also use SAS Enterprise Guide to create simple reports. One easy way to do this is to set “SAS Report” as the default results format as discussed earlier in the section, Feature 6 – Generate Results in Many Formats. Another way to generate a simple report is to select *File* → *New* → *Report*. The New Report dialog box lets you create simple SAS Reports using the items in your project. For example, Figures 17 and 18 show a simple report created by combining SAS Report output generated from several tasks and inserting a banner image.

After creating a report, you can save a report to a SAS Folder by selecting *Publish* from the report pane's menu. Then it can be consumed by other products like SAS Add-In for Microsoft Office or SAS Web Report Studio.

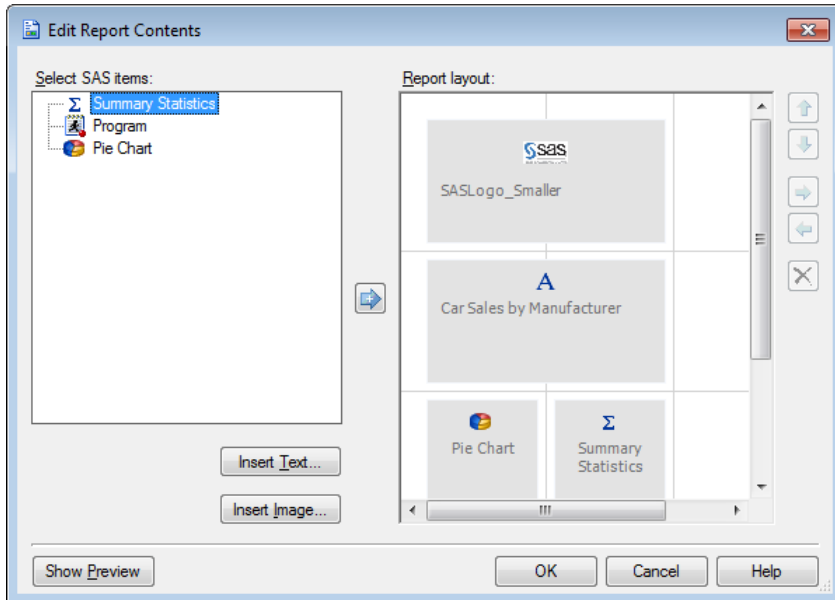


Figure 17. Using *New* → *Report* to Create a Simple Report from the Output of Two Tasks

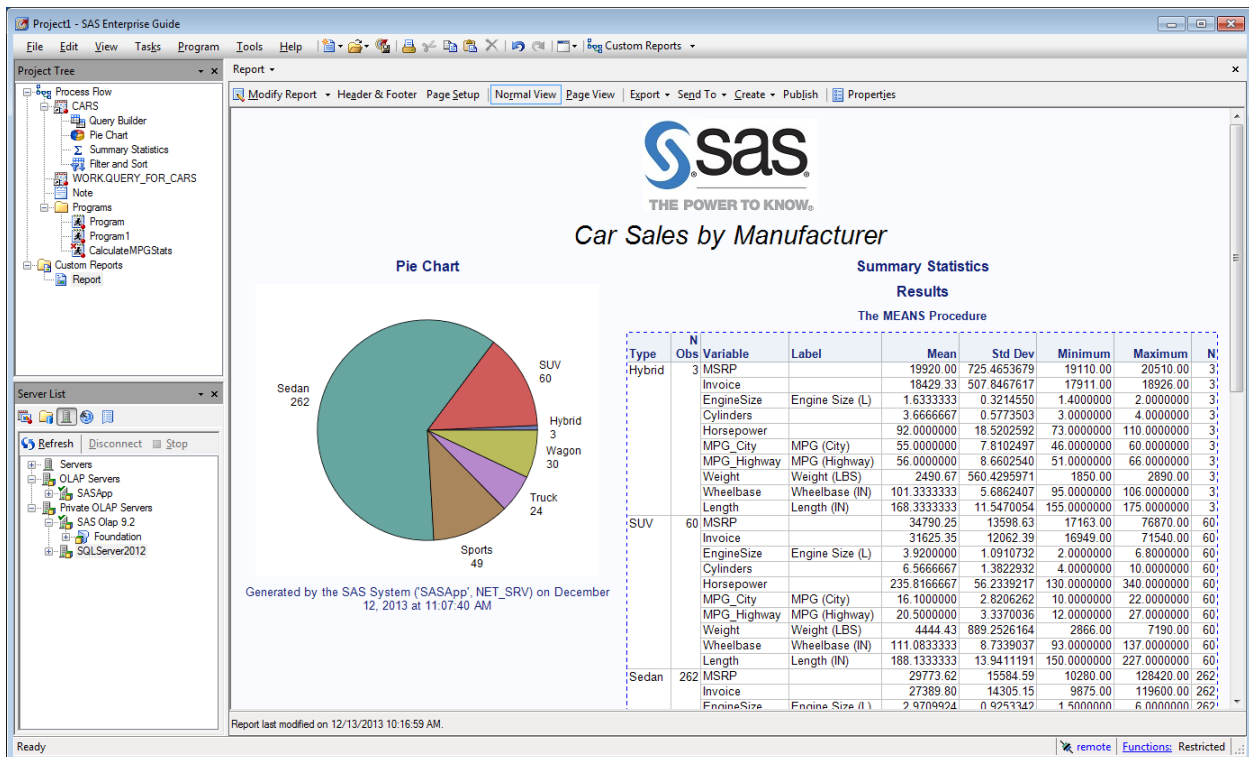
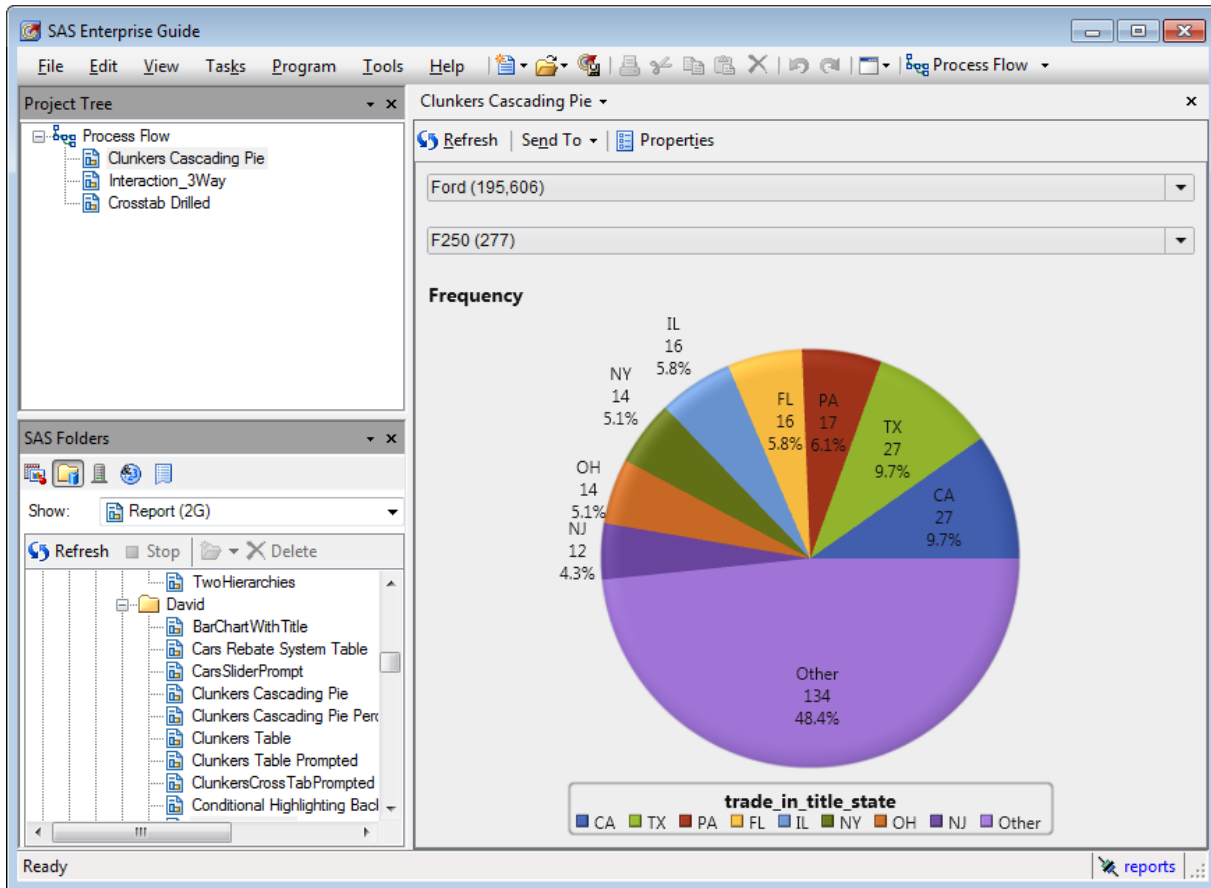


Figure 18. Example Simple Report Generated Using *New* → *Report*

## FEATURE 18 – VIEW SAS VISUAL ANALYTICS REPORTS

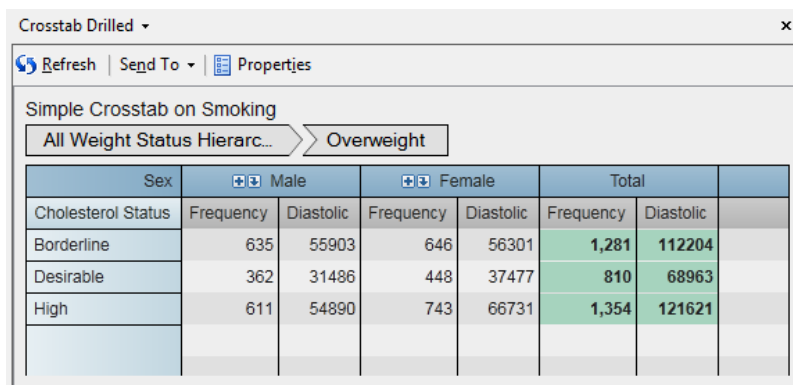
The first maintenance release of SAS Enterprise Guide 6.1 provides integration with SAS Visual Analytics 6.2 and 6.3. This integration allows SAS Enterprise Guide to open and refresh reports that were created using SAS® Visual Analytics Designer and SAS® Visual Analytics Explorer. SAS Enterprise Guide 6.1 cannot be used to generate SAS Visual Analytics reports, unlike SAS Web Report Studio reports.

To open a SAS Visual Analytics Report using the File dialog box, you select *File* → *Open* → *Report* and change the “Files of type” control to be “SAS Report (2G) Files.” To open a report using the SAS Folders panel in the Resources pane, set the *Show* field to either “All applicable SAS types” or to “Report (2G).” (Figure 19)



**Figure 19. Viewing a SAS Visual Analytics Report**

The report viewer in SAS Enterprise Guide is fully interactive. Figure 19 shows a pie chart report of automobile trade-in data. The two controls at the top of the display are used to filter the data displayed. In the example shown, the data for Ford F-250 trucks is shown. Figure 20 shows a crosstabulation table. The breadcrumb trail controls at the top of the report are used to select higher levels, while the drill down controls in the table headers are used to drill into a hierarchy.

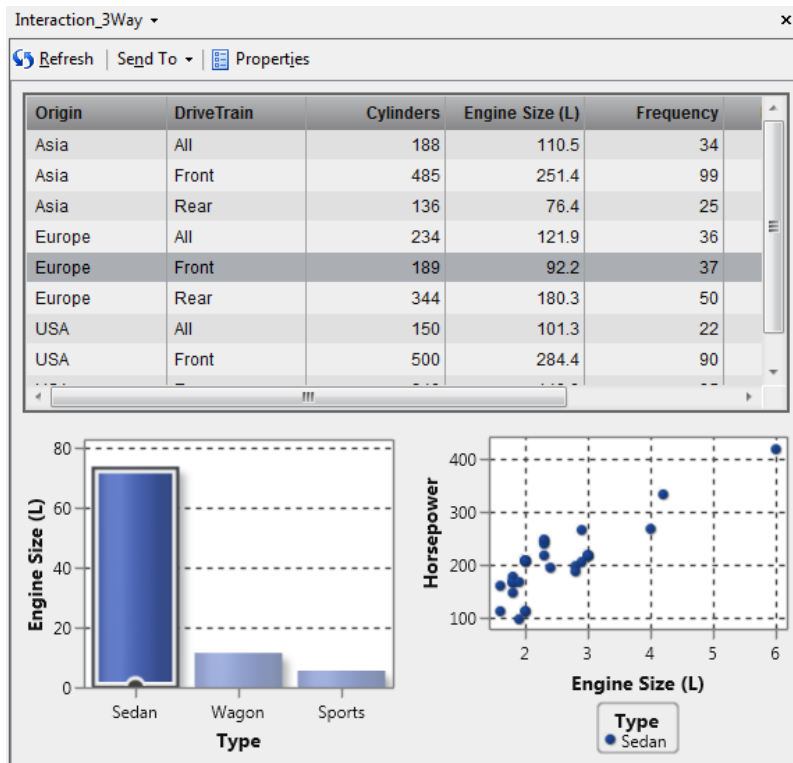


**Figure 20. Interacting with a SAS Visual Analytics Report in SAS Enterprise Guide.**

Figure 21 demonstrates a three-way interactive report. Selecting the “Europe – Front” row in the table causes the bar chart and scatter plots to only show data for front wheel drive cars manufactured in Europe. Subsequently clicking the



“Sedan” bar further filters the scatter plot to show Horsepower and Engine Size data for Front Wheel drive sedans manufactured in Europe.



**Figure 21. Interacting with a SAS Visual Analytics Report in SAS Enterprise Guide.**

Reports are cached in the client so that they can be viewed later even if the server they were opened from becomes inaccessible. However, settings made in SAS Enterprise Guide are not persisted to the server. For example, if you drill into a specific hierarchy level, that will not be reflected in the report when viewed in other applications.

## CONCLUSION

SAS Enterprise Guide is a powerful tool that allows many types of users to use the power of the SAS System in a familiar Windows environment. It is a mature product that has a wide breadth of features to help users be productive in their work.

In this paper, we surveyed some of the main features in recent releases of SAS Enterprise Guide. We hope this will help users who were familiar with older releases of the product learn about and use the enhancements made in more recent releases.

## REFERENCES

- Burke, Michael; Fu, I-kong. 2012. “Finding Your Inner Query with SAS Enterprise Guide.” *Proceedings of the SAS Global Forum 2012 Conference*. Cary, NC: SAS Institute Inc. Available at <http://support.sas.com/resources/papers/proceedings12/292-2012.pdf>.
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## RECOMMENDED READING

- Hemedinger, Chris. 2013. “For All the Hats You Wear: SAS Enterprise Guide Has Got You Covered.” *Proceedings of the SAS Global Forum 2013 Conference*. Cary, NC: SAS Institute Inc. Available at <http://support.sas.com/resources/papers/proceedings13/412-2013.pdf>.

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