Paper 410-2013

SAS® Enterprise Guide®: It is More than a Gift from Outer Space

Tricia Aanderud, And Data Inc, Raleigh, NC

ABSTRACT

SAS Enterprise Guide seem alien to you? Let's walk through the many SAS Enterprise Guide features using some UFO sightings data. During the presentation, you will walk through some basics, learn how to change the advanced options, and explore some newer features of SAS Enterprise Guide.

INTRODUCTION

If you just started using SAS Enterprise Guide or have been using it for a while, you might suspect the tool is a gift from the aliens. This paper uses UFO sightings collected on the National UFO Reporting Center web site to show you how to use the basic and hidden features of the tool.

UNDERSTANDING THE WINDOW LAYOUT

SAS Enterprise Guide uses a *project* to organize your work. The project shown in Figure 1 has data from the UFO library called FULL_MOON_PHASES and one program that contains SAS Code. The application has three areas to control your work:

- **Project Tree** contains your SAS code, references to datasets, notes, and report results organized as a Process Flow.

  Tip! Use **File > Open** to add your existing programs to the Programs folder.

- **Server List** allows you to access the data libraries. You can also see libraries on a remote system with the proper network connections.

- **Process Flow** This is the main work area. It shows a diagram of the current process flow. As shown in the inset, click the Program icon to view your code or makes changes.

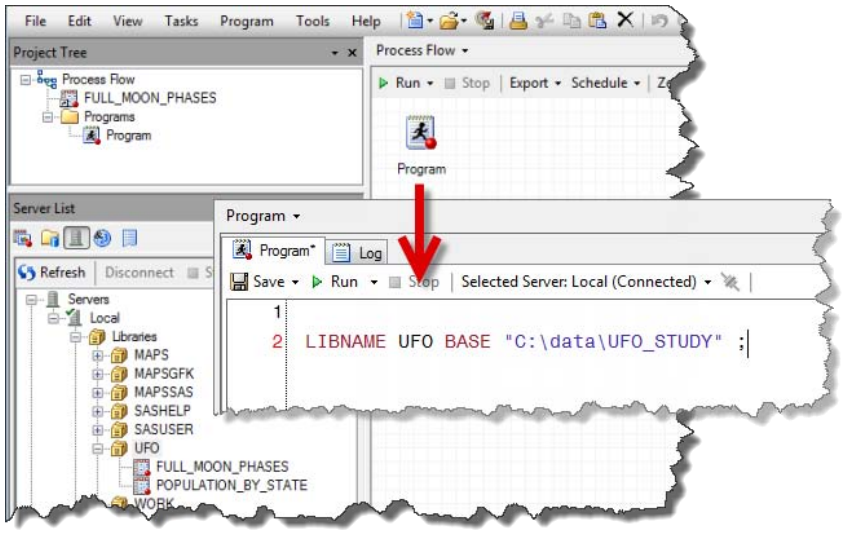

Figure 1. Window Overview of a Project

IMPORTING DATA INTO SAS ENTERPRISE GUIDE

The National UFO Reporting Center (http://www.ufocenter.com) allows you to report any UFO sightings. When reporting the sighting, you list when, where, the shape, duration of encounter, and then a summary of the event. The data was downloaded into a Microsoft Excel spreadsheet that you can import into SAS Enterprise Guide.

NUFORC Home

Date / Time	City	State	Shape	Duration	Summary	Post
5/7/12 22:40	Milwaukee	WI	Diamond	approx 5 mins	Strange bright light which suddenly appeared in the south western sky over lake michigan..near milwaukee. Semblance of lights of a plan	5/13/
4/28/12 21:55	Algoma	WI	Unknown	1 minute	4 brightly lit crafts traveling at different speeds, low elavation, with no sound present.	5/13/

Figure 2. UFO Data Example

Use the Import DataTask

You can import spreadsheet data into SAS Enterprise Guide easily. Use the **File > Import Data** to import Excel, CSV, or other text files. A task, which is similar to the wizards found in other products, guides you through the four-step process and the result appears in the Process Flow area, as shown in the following figure. You can rerun the task at any time if the spreadsheet data changes.

If you are not satisfied with the results, click the **Modify Task** button above the dataset to make changes.

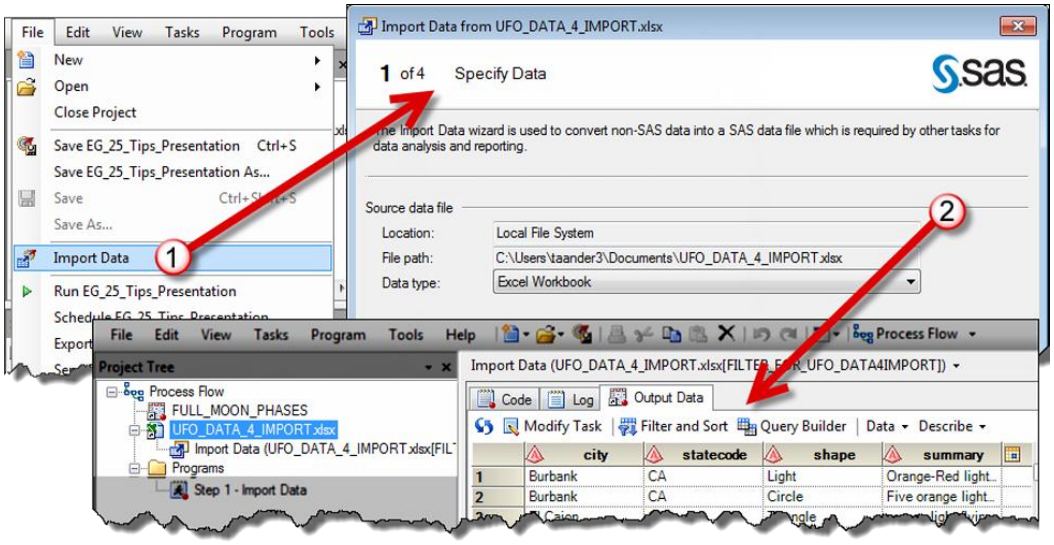

Figure 3. Using the Import Data Task

EXPLORE NEW DATA QUICKLY

Once you have imported the spreadsheet data into SAS Enterprise Guide – you can review the data easily using the Characterize Data task. From the Process Flow area, select **Describe > Characterize Data**. From the Characterize Data task accept the defaults and select **Finish** to see the results. The results appear in the Process Flow area and include summaries, graphs, and frequencies for all variables.

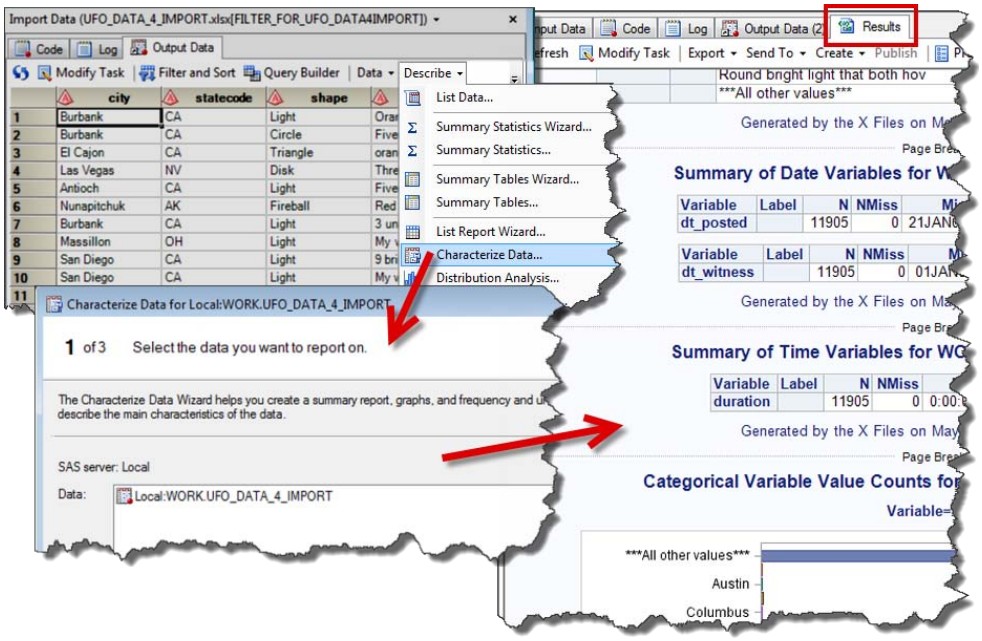

Figure 4. Using the Characterize Data Task

ADD DETAILS OR REMINDERS WITH THE NOTES FEATURE

Use Notes to add any information about the program or task results. Select **File > New > Note** to insert a note. In the following figure, you can see a Note in the project tree and its content in the process flow area. Notes can have reminders for how data is setup, information for other programmers, or just a quick place to keep a reminder.

Double-click the Note (or other objects) in the Project Tree to rename it.

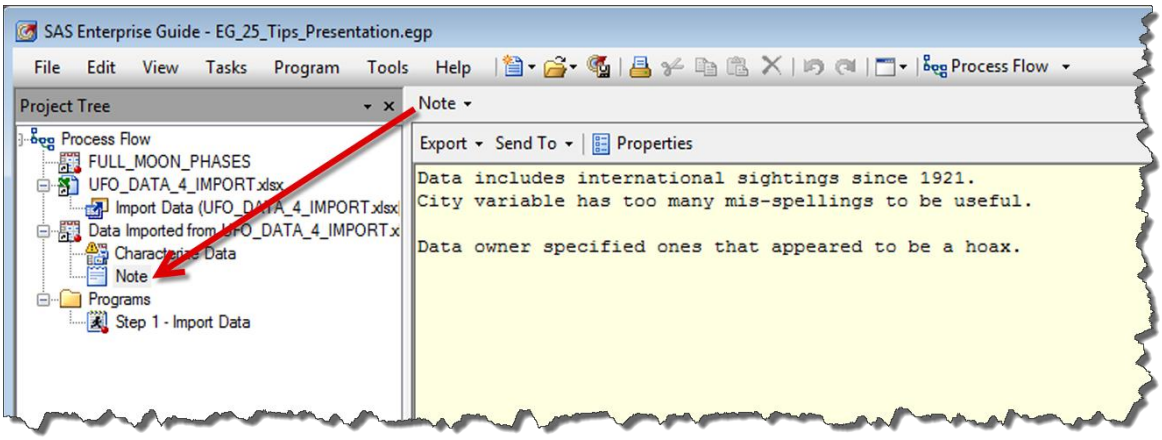

Figure 5. Add Notes to the Project

USE MULTIPLE PROCESS FLOWS TO ORGANIZE YOUR CODE

You can add as many programs as you want. Programs are listed in the Programs folder in the Project Tree.

- To open an existing program, select **File > Open > Program**. When a program is opened it is considered referenced since it is stored outside of SAS Enterprise Guide.
- To add a program where you can place your code, select **File > New > Program**. This is an embedded program because it is saved within SAS Enterprise Guide. You can avoid the point-and-click environment this way.

You can have more than one process flow, which allows you to organize the programs into separate areas. Select **File > New > Process Flow** to add more process flows. InFigure 6, you can see three different process flows that use a combination of embedded programs and referenced programs. The reference programs have a small arrow in the left corner of the icon.

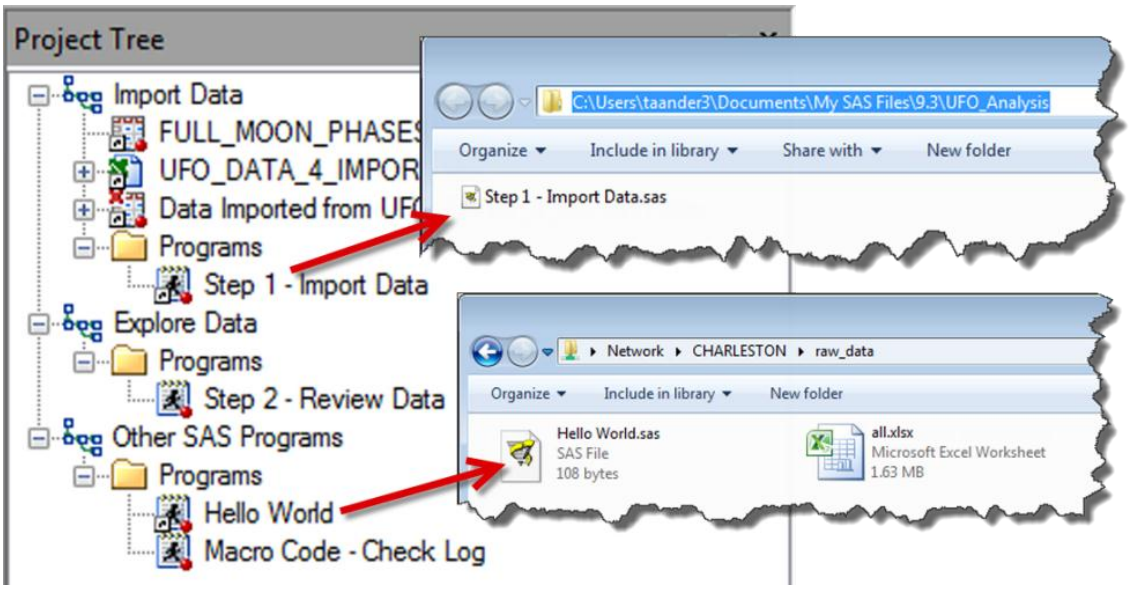

Figure 6. Use Multiple Process Flows

LET SAS DO THE HEAVY LIFTING

Many programmers do not realize that you can use a combination of tasks and coding to accomplish results quickly. SAS Enterprise Guide has many ways to make the coding process easier. In this example, use the Query Builder to start the code and then copy that code into your program.

QUERY BUILDER WRITES YOUR SQL CODE

When you have a large dataset with many variables or tricky variable names use the Query Builder to write the code, which you can access by right-clicking the dataset name and select **Query Builder**. Query Builder allows you to join tables, filter data, and sort data. The tasks outputs SQL code, so anything possible with SQL can be done.

In the Query Builder window, drag the variables names to the Select Data pane and click **Run** to see the results.

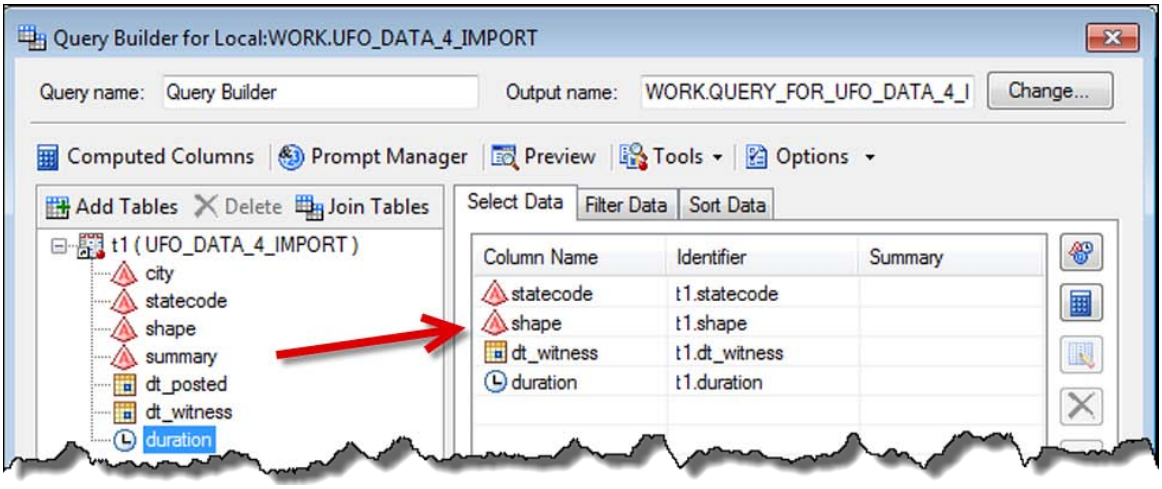

Figure 7. Use Query Builder to Write Your Code

From the Query Builder Code process flow, cut and paste the code into your program and make any changes, as shown in Figure 8. You can change the output dataset, add new variables, or change the existing variables.

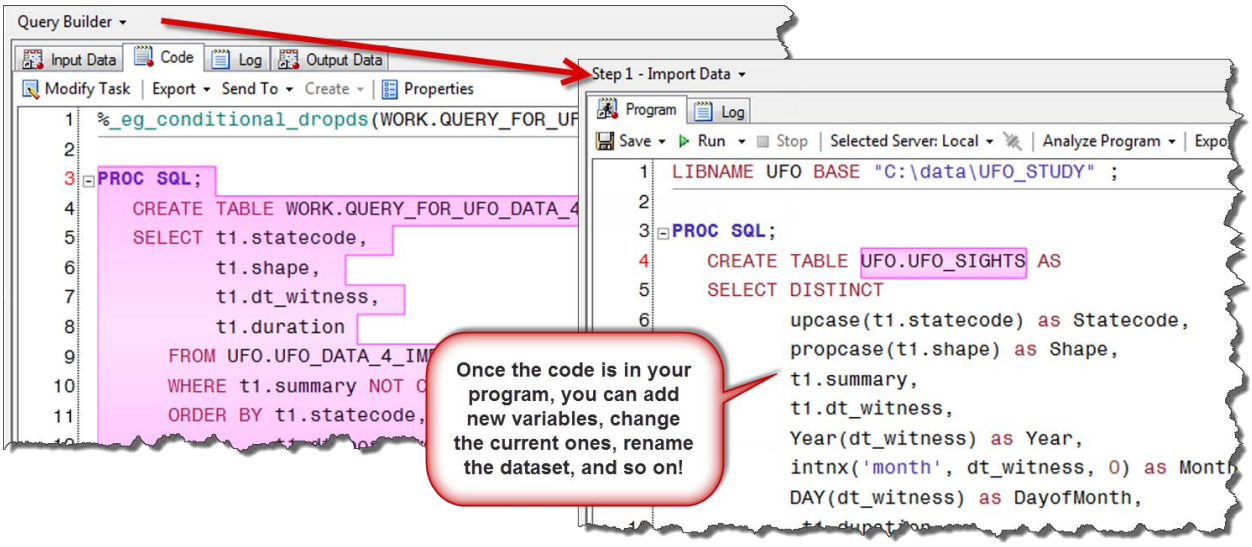

Figure 8. Copy code from the task to prevent typing

To run the code use **Program > Run** or **F8** to run the code. You can also select sections of the code and use **F8** to run only the needed areas.

Shortcut! Type **Ctrl+ /** to comment code and **Ctrl+Shift+/** to uncomment the code.

Auto Complete Helps You Remember

Starting with SAS Enterprise Guide 4.3, SAS introduced the auto complete feature. With AutoComplete, SAS suggests the next coding statement, such as libraries and dataset names.

This feature is particularly useful when working with macros. It has all of the macro and macro variables available.

Notice in Figure 9 when you type ***&m,*** the tool lists all macro variables. Likewise when you type ***&t*** , the tool lists all macros, including the one just created.

When you are working with huge programs, this feature helps you remember the exact names to ensure accuracy and saves programming time since you do not have to scroll around looking for the code.

You can control this feature from the **Program > Editor Options > Autocomplete** if you find it annoying.

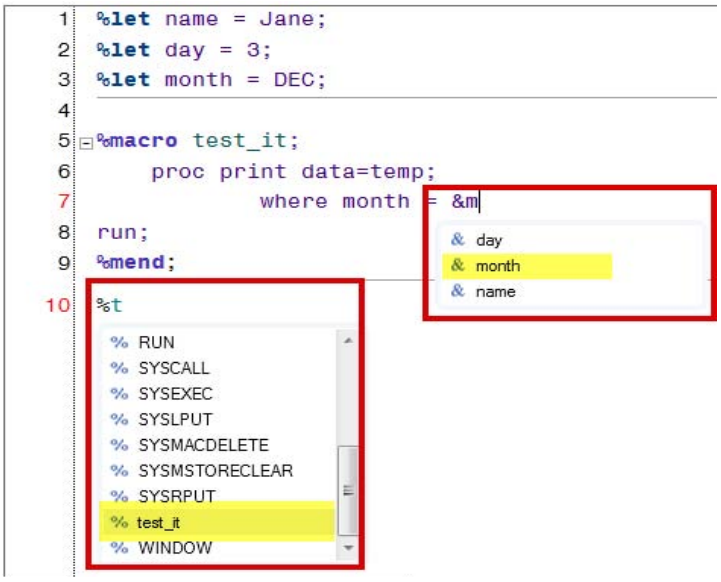

Figure 9. Autocomplete works well with Marcos

Use a Task to Create a Map

Tasks are helpful when you are learning a new PROC or when you do not use the feature often, such as with the MAP feature. You may need to shape your data to work with the specific map dataset. For instance, the MAPS.US uses a STATECODE variable that contains the abbreviation (CA, NC, NY and so on) for each US state.

The UFO_SIGHTS dataset contains observations from several years so an additional variable that contains the count by state and year was added. This variable is what controls the color for each state. The more sightings for the state, the darker the state appears.

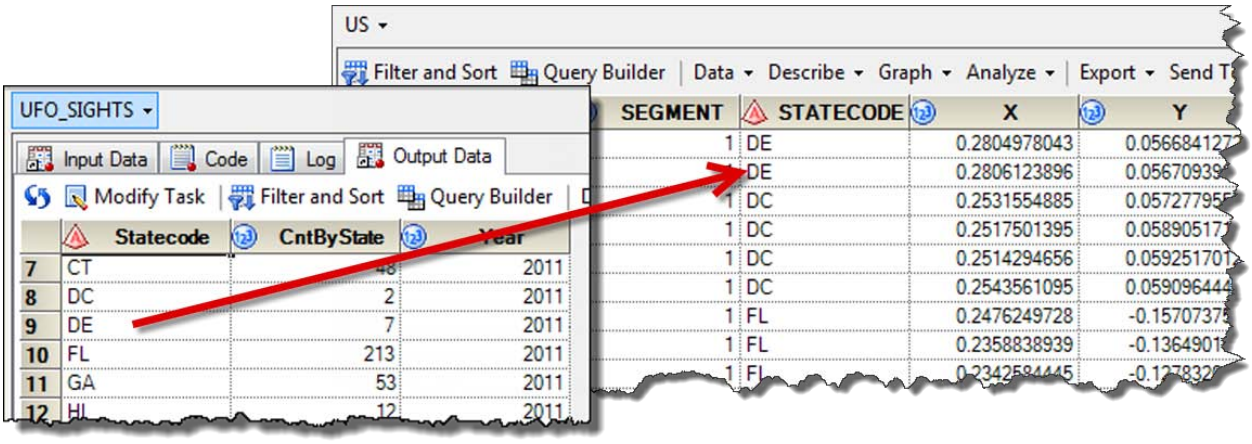

Figure 10. Ensure your dataset is setup properly for the task

To run the task, you need to select the UFO_SIGHTS dataset and then **Tasks > Graphs > Map Chart**. The Map Chart tasks guides you through the process.

Use the Preview pane to see how your other choices appear in the map before running the output.

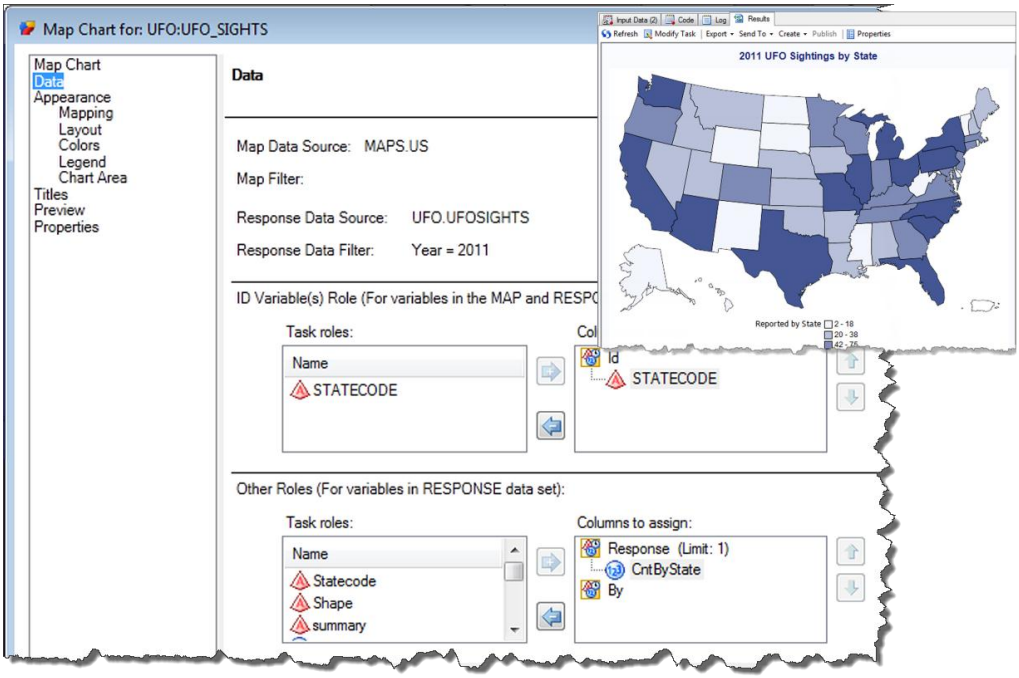

Figure 11. Use tasks to learn or use unfamiliar procedures

CHECK THE LOG

In Figure 12 we introduce an error by commenting out the source dataset.

When you run the code, the Log tab appears immediately to alert you there is an issue. In addition, notice the Program tab icon changed to include a red X.

When receiving a new project, scan the Project Tree to see if there are any errors (see example in Figure 6. Use Multiple Process Flows

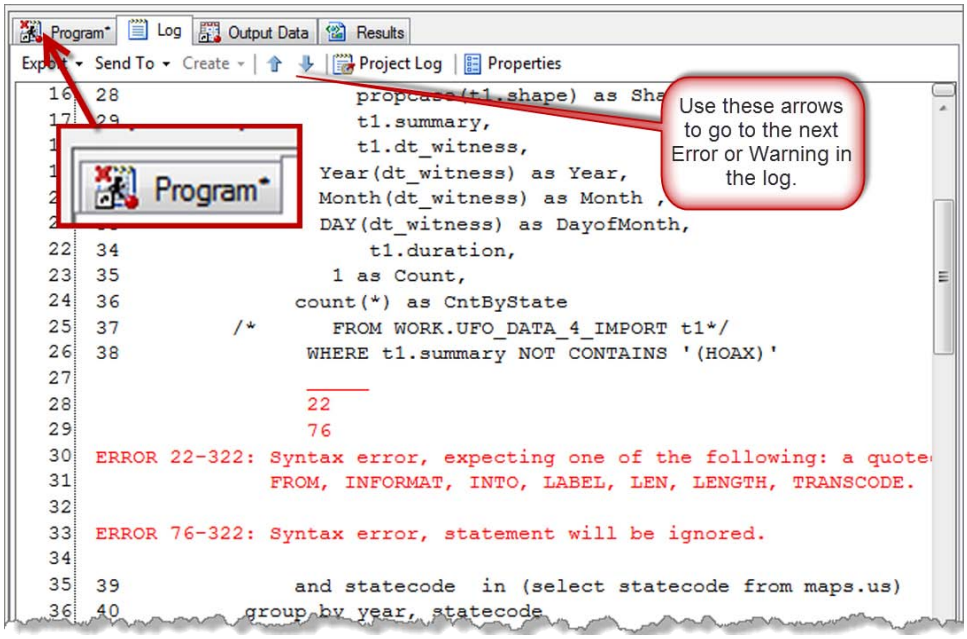

Figure 12. Log file available after program completes

CHANGE THE WINDOW LAYOUT

You can arrange the process flow area to see the log and code at the same time.

Select the Workspace Layout icon and then the layout you want, which can be **Stacked** or **Side By Side**.

Select **Single** to return to the single view layout.

You can select the tabs from each area to show the program, log, data, or results.

Shortcut! Select **Ctrl + M** to create maximize the project flow space.

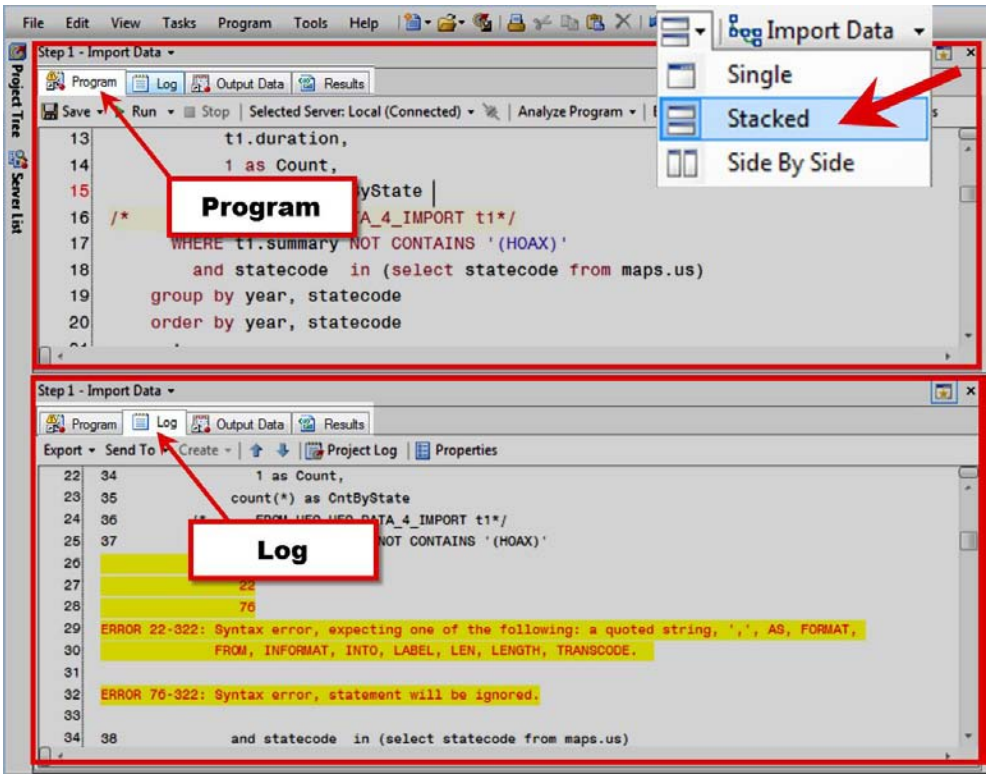

Figure 13. Change the layout in the Process Flow

CHANGE THE OUTPUT OPTIONS

You can change the format of your output so that the final report goes to HTML, PDF, RTF or just listing. Select **Tools > Options** and then **Results General**. The next time you run the code or task, the results are in all the selected formats.

Many users find HTML output generates quicker when you have larger results.

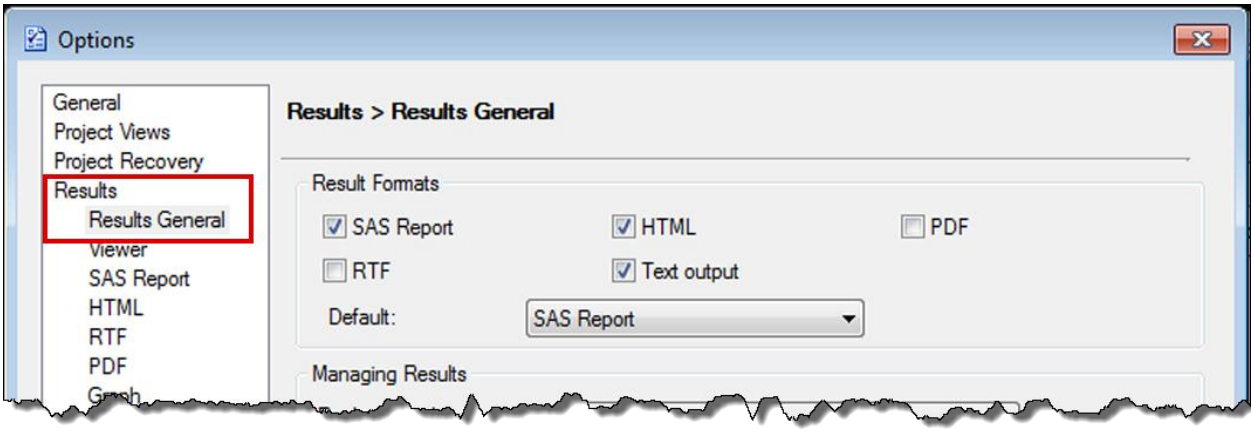

Figure 14. Choose different results

To send your data or results to a Microsoft Office location, select the Send To menu and the desired application. You can also send your Output Data to Microsoft Excel.

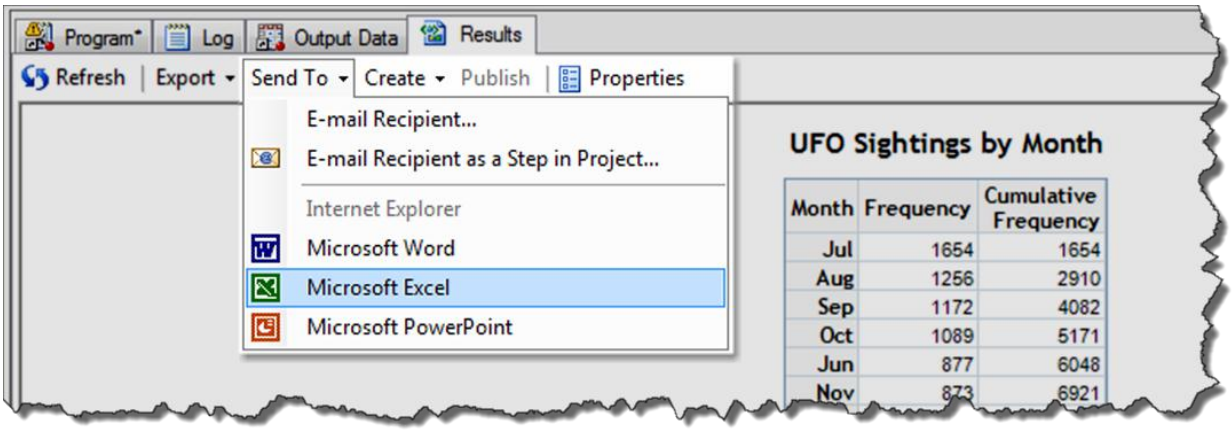

Figure 15. Quickly place results in MS Office Applications

Update the Code and Log Schemes

You can change the colors used in your code or log. The color cues assist in navigating the code or log. To change the look, select **Programs > Editor Options** and then the **Appearance** pane.

To change the code, do the following:

1. Select SAS Program File or SAS Log File from **File type**.
2. Select the element you want to change, such as Comments.
3. You can change the font, foreground color, background color and font style. The results show in the Preview area.

Select **Ok** to accept the changes and return to your program or select **Save As** to save the options.

Change your error statement in the log to be bright yellow with red text as shown in Figure 13 so it is easy to locate.

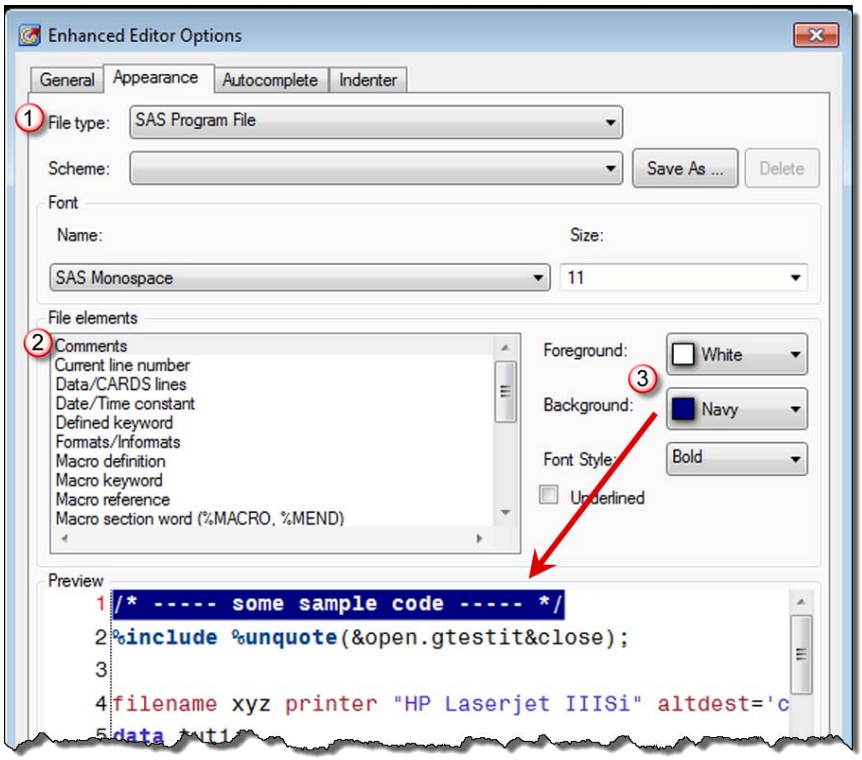

Figure 16. Making changes to the code

CONCLUSION

SAS Enterprise Guide is a feature rich application that makes programming tasks easier. Using the tasks, editor features, and options, you can improve your programming speed and accuracy. You can learn more tips from the Business Intelligence for SAS BI Users (http://www.bi-notes.com) blog.

ACKNOWLEDGMENTS

Thanks to Chris Hemedinger for suggesting a few additional features.

REFERENCES

- Business Intelligence Notes for SAS BI Users, *http://www.bi-notes.com*

RECOMMENDED READING

- Aanderud & Hall, *Building Business Intelligence with SAS*: *Content Development Examples*, SAS Press, Cary, NC.
- Hemedinger & McDaniel, SAS® For Dummies®, SAS Press, Cary, NC.
- SAS You Tube Channel, http://www.youtube.com/user/SASsoftware/videos?query=enterprise+guide

CONTACT INFORMATION

Your comments and questions are valued and encouraged. Contact the author at:

Tricia Aanderud
And Data Inc
tricia.aanderud@and-data.com