Paper 265-2013

SAS Enterprise Guide® -- Implementation Hints and Techniques for Insuring Success With the Traditional SAS Programmer

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ABSTRACT

There are many configuration options available in SAS® Enterprise Guide® for both the product itself and the included enhanced editor. There are also numerous software products from SAS® that may or may not be licensed at your site and greatly affect your workflow. Workflow options while developing the code are numerous and range from simple line-by-line execution up to and including the running of an entire process flow or project. Storage of SAS code under development also deserves careful thought. All of these topics and more are addressed to enable users to have a very thorough non-frustrating first-time experience with SAS Enterprise Guide. The presentation is aimed at users who have experience coding and running SAS programs. This presentation is a video presentation created using SAS Enterprise Guide 5.1 and SAS 9.3.

INTRODUCTION

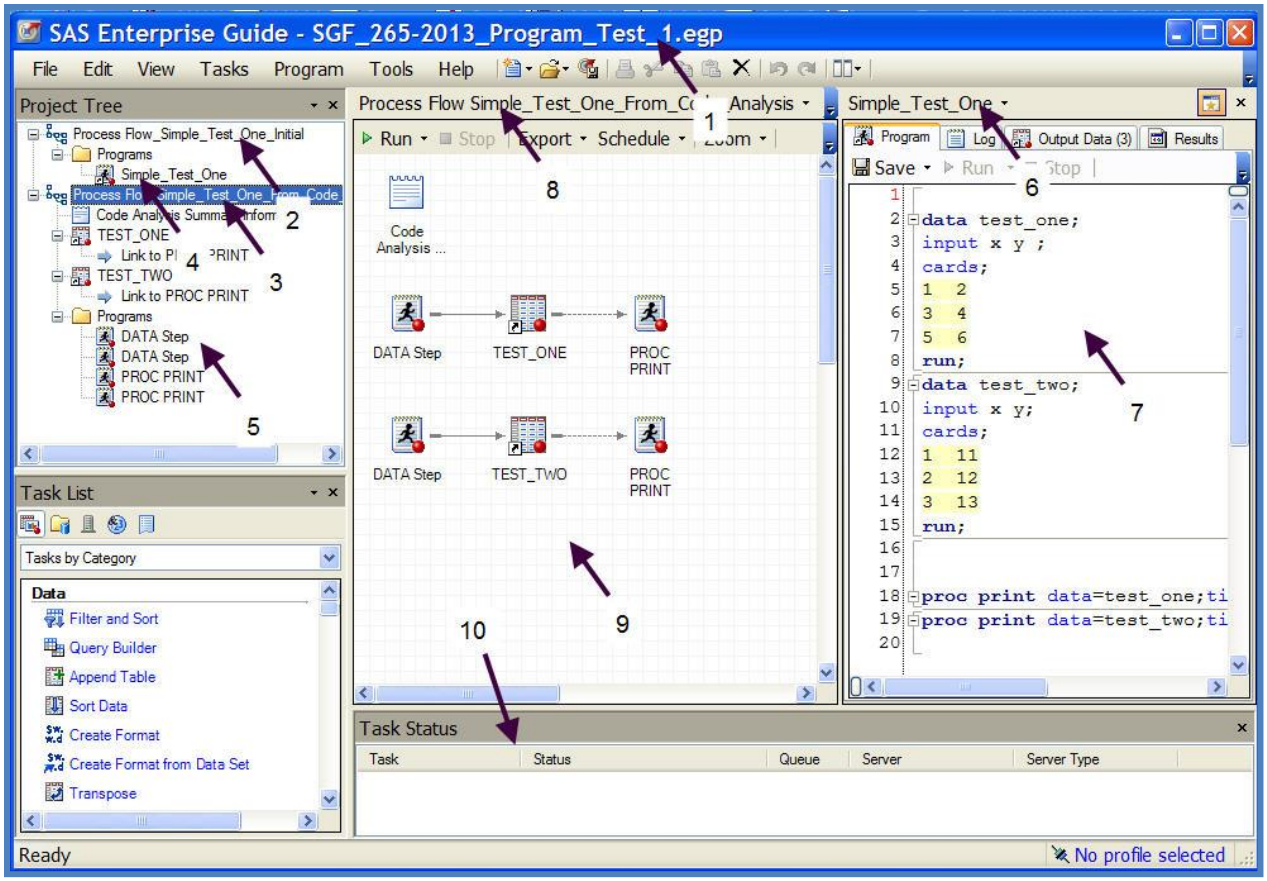
Traditional SAS programmers develop SAS code in files and submit it for processing regardless of the operating environment (PC, Unix, etc.). SAS Enterprise Guide (EG) follows this model, but adds some unique additional capabilities. This paper addresses setup, initialization and workflow ideas to smoothen and enhance the transition to the EG graphical user interface centered around a process flow window. Dual screen systems, split views and internal vs. external SAS code storage will be addressed. Certain features in SAS EG may either be hidden or exposed with advantages to doing either. The number of process flows in an Enterprise Guide Project offers flexibility in constructing the total programming effort. Techniques for submitting developing code for step-by-step processing vs. the submission of entire project files is discussed. The video will address environmental settings for both EG itself and for the enhanced code editor. And lastly, the handiest key in EG, the F4 key, which is used to toggle back-and-forth between the current Process Flow window and the most recent window (program, data set, log, output, etc.) will be utilized.

This presentation is a video poster. The video will be referenced at the proceedings site for the 2013 SAS Global Forum and the author also maintains publicly available YouTube playlists. This paper will be very brief from an instructional standpoint and will only serve to partially overview the video content.

THE INITIAL SCREEN ONCE A PROGRAM HAS BEEN RUN

To create Display 1, Enterprise Guide was launched. A new project was started (File, New Project). A new process flow was started (File, New, Process Flow) and a new program was started (File, New, Program). The program could as well have been one that preexisted prior to this launch. This program was then ran. **The concepts of project files, process flows and programs are all covered in Muller (2012) and Muller and Penix (2012) and will not be discussed further in this paper and video.** The goal of this paper/video is to surface techniques and settings useful to the traditional file-based programmer to get up and running in the EG workflow.

The project name is noted in Display 1 (Item 1). There are two Process Flows (Items 2 and 3) shown in the Project Tree Window. The initial simple SAS program is shown in the project tree (Item 4). The actual code in this file is shown in a split window of the Process Flow (Item 7). Notice that the file name is shown as Item 6 at the top of that split window.



Display 1. The Enterprise Guide Startup Window After Running an Existing SAS Program.

Workspace Splitting. The workspace shown in Display 1 is not the default. It was split by using the menu commands shown in Figure 1. The "Side By Side" option works particularly well when the EG display is stretched over a dual monitor configuration and allow for two simultaneous operations to be viewed. It is wonderful for editing a file.

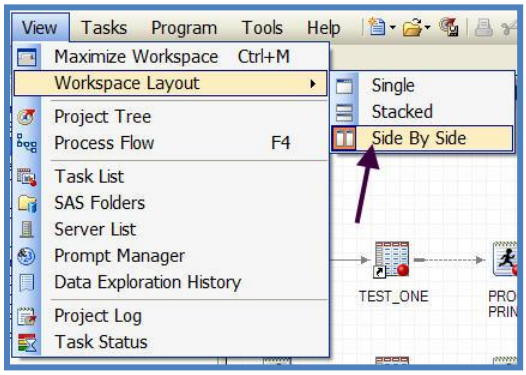


Figure 1. Splitting the Workspace.

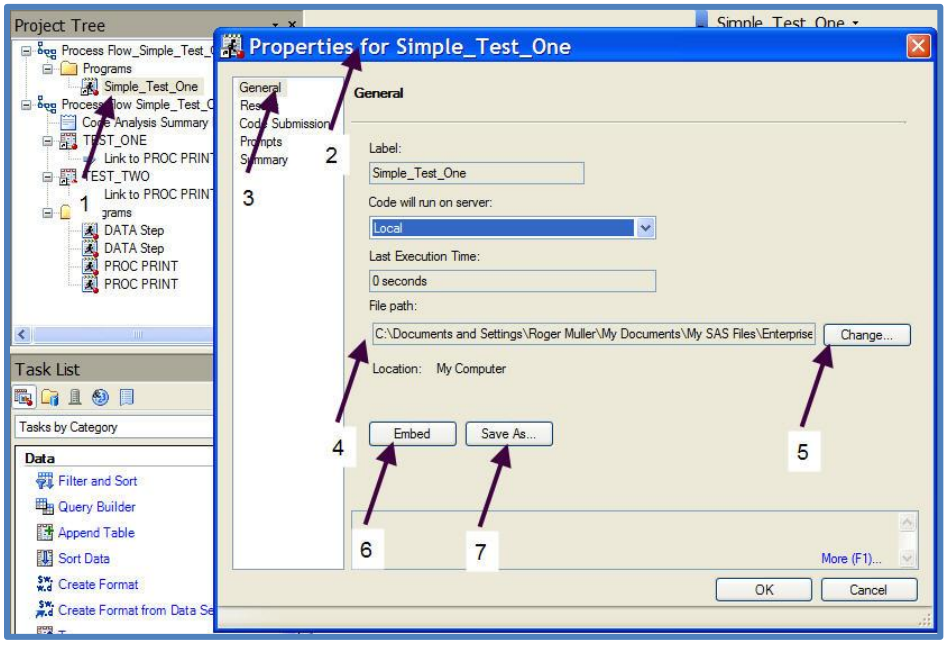
PC Computing Equipment and Display. Enterprise Guide is very flexible in adapting to and optimizing the resources available. In general, the more "screen real estate" you have, the greater the flexibility and ease of use. As shown in Display 1, the workspace splitting could crowd small screens. In addition as will be shown later, an enhanced editor window can be further split.

Creating Process Flows from Existing Code. In Display 1, there is a second process flow (Item 3). This process flow was created from the SAS Code file (Item 6) by choosing a tab (hidden from view) "Analyze Program", "For Process Flow". This resulted in the generation of the second process flow (Item 3) and the SAS code files in it. SAS code files run in the EG environment produce a much more detailed process flow diagram if they are subjected to this technique (results shown as Item 9 in Display 1). The analysis and "flowing" of existing code became available with the release of EG 4.3.

The Task Status Window. When a job is running, detail about what is happending on a step-by-step basis is shown in the Task Status Window (Display 1, Item 10). This is job monitor that allows you to detect system-lockups, poor perfomance, etc. and also allows you to stop the processing that is occurring in a method that is far more eloquent that Cntl-Alt-Delete. **Do not turn this window off.** It provides maximum benefit for a very small amount of screen real estate.

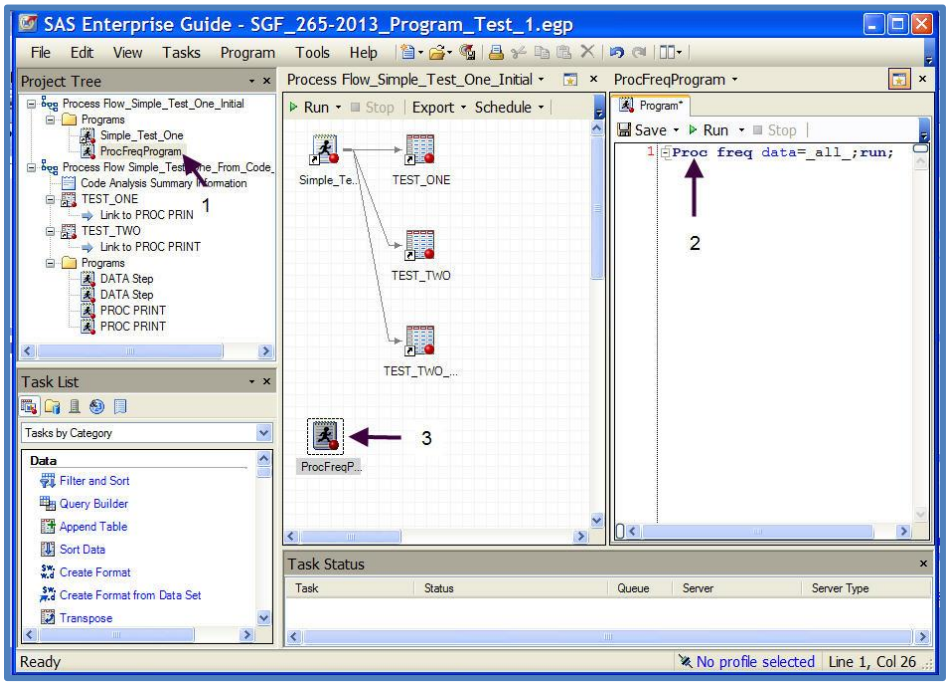
STORAGE OF SAS PROGRAMMING CODE, EMBEDDED VS NOT EMBEDDED

The storage of SAS code associated with Enterprise Guide is an issue that programmers often find confusing. Is the SAS code stored in programs that are "embedded" in the EG project file (i.e. internal to it) or "not embedded" somewhere else? Why is this so important? Either or both methods can be used. Mass confusion occurs when naming conventions are not clear. Identical naming of files is to be avoided. More importantly, project files must be backed up. If the SAS program files are embedded, they are included in the backup of the project file. If the files are not embedded and stored in their own separate directories, the backup for them is a separate operation. There are enough pros and cons on the benefits of each technique to make for a separate presentation. The discussion here is to make you aware of the differences and the ramifications of using each.



In Figure 2, the properties of an external (not embedded) file are shown. This was accomplished by right-clicking on the file name in the Project Tree (Item 1) and selecting properties. General properties (Items 2 and 3) show that the path is in to an external directory (4). There are provisions for changing this name and directory (5). Also, it can be changed it an embedded file (6) with a new name (7). The point is --- this is a stand-alone file stored external to the project.

Figure 2. Properties of an Externally-stored SAS Code File.



In Figure 3, a new program has been added to the first process flow. The program has a name of "ProcFreqProgram". It was NOT saved at the time of creation to an external directory. Consequently by default, it is just "parked" inside the project file and is considered "embedded" by default since it was not specifically saved.

Figure 3. Creation of an Embedded SAS Program "file".

In Figure 4, the file has been selected in the Project Tree and the right mouse clicked to show general properties (2). The file path shows that the “file” (i.e. code) is embedded in the project (3). Thus, it will be saved whenever the project is saved, and more importantly, backup of the project will back up the SAS code program.

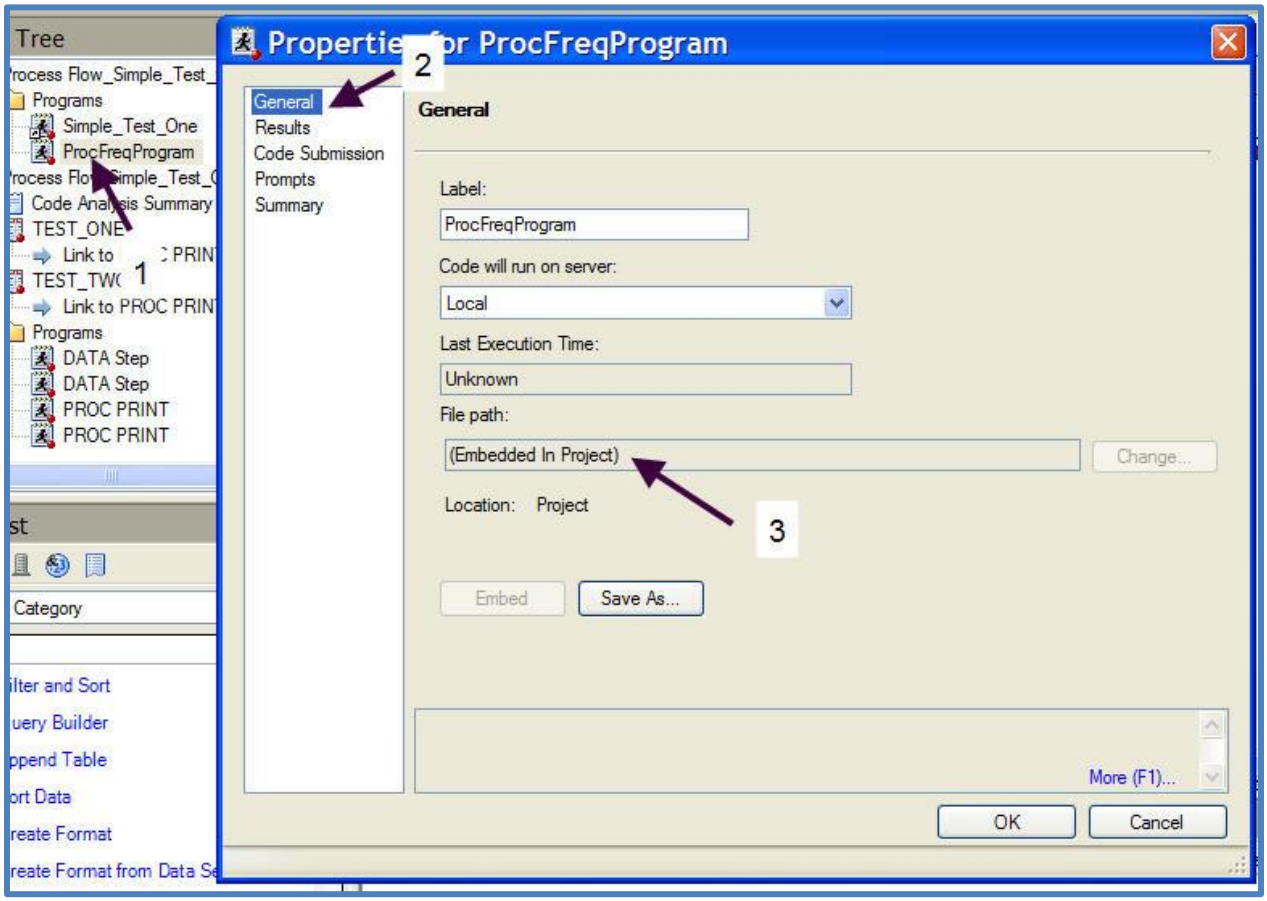


Figure 4. Properties of an Embedded SAS Code File.

HOW TO CHOOSE THE OUTPUTS YOU WANT GENERATED

Enterprise Guide makes generating outputs very easy at the procedural level. You then assemble these outputs into more complete reports. To pick one or more outputs to be generated after every proc, go to Tools, Options (Figures 5 and 6) and select one or more of the output types. As a side note, most other options for EG that are available here are best left to default when you are getting started with EG workflows. This is the only "EG" option discussed in this paper. Types of output include straight text, a new generation SAS report, HTML, RTF and PDF. Multiple selections can be made to generate multiple outputs for differing uses.

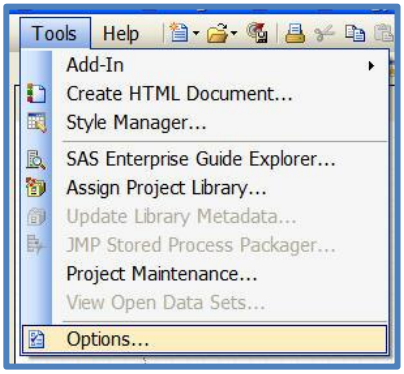


Figure 5. Selecting Options for EG .

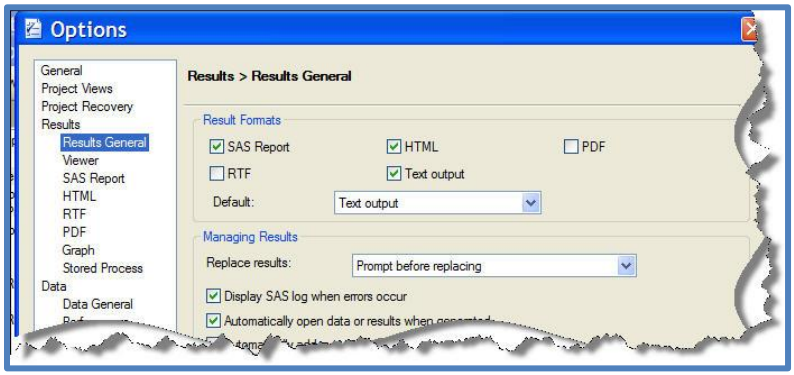
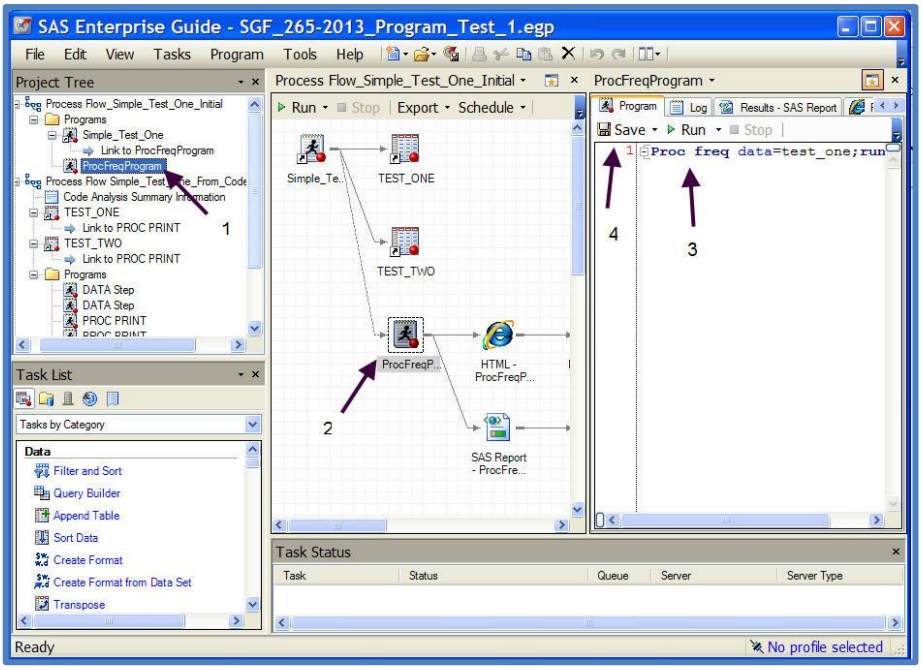


Figure 6. Select As Many Output Result Types As You Wish.

THE RUNNING OF A MORE COMPLEX PROCESS FLOW, GENERATING REPORTS

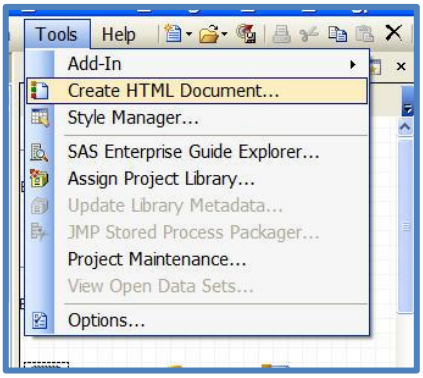


A minor adjustment was made in the process flow in Figure 3. The frequency code file is linked to the original "Simple_Test_One" program (Figure 7, details of this operation not show, just the results, see Item 2). The entire process flow was then run, resulting in some listings from Proc Prints (icons are not showing) and some output from the ProcFreqProgram including an HTML file and a SAS report. These are shown to the right of item 2.

Figure 7. EG Display After the Process Flow Is Run.

What do we do with these outputs? In most other SAS workflows, outputs accumulate into one big "listing" file and you simply print or edit it. These can be processed/printed one at a time, but if we want to make a more complete cumulative report they must be "assembled" into that entity.

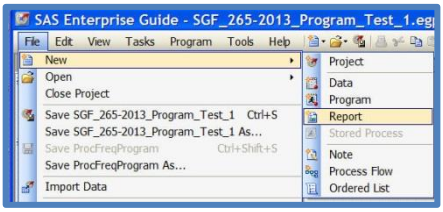
ASSEMBLING AN HTML REPORT



Complete details of making one HTML file are not shown here. Start in Figure 8 by using the menu commands "Tools, Create HTML Document…". The process essentially involves interactively selecting any or all of the HTML outputs and arranging them into a final document. The end result is an icon showing on the process flow which can be double-clicked and the consolidated document shows in a result window (Figure 10).

Figure 8. Creating an HTML Document.

ASSEMBLING A REPORT



A "report" document creation is very similar (Figure 9). Select "File, New Report".

Figure 9. Getting Started With a Report Document.

THE ASSEMBLED DOCUMENTS

The exact details of these two report generation activities are not reported here as they are pretty straight forward (pick and choose the elements you want). They are added to the process flow and will be rerun at future times. The end result of this example in the video will be a one-page report that can be printed. A one-page HTML file called "Document" is shown as is an icon labeled "Document". The other icon is called "Report" for the report file.

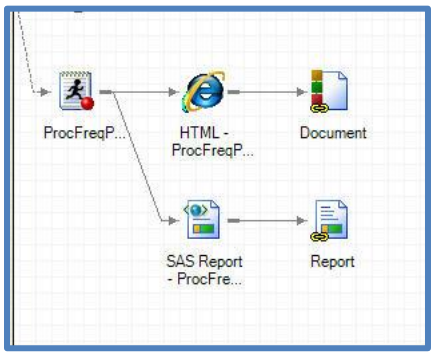


Figure 10. The Process Flow After Assembling Reports.

By double-clicking one of these (we'll do only the HTML "Document"), the output will open in its own window (Figure 11, Item 2). This is the file that most likely would be "final" and emailed or printed.

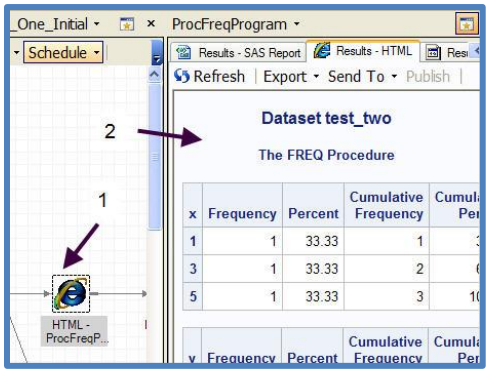


Figure 11. Opening the Assembled HTML Report.

This concludes the discussion on general workflow for working with EG.

THE ENHANCED SAS CODE EDITOR --- CONFIGURING OPTIONS

The transition from previous SAS workflows to EG can be eased by several configuration options for the SAS enhanced code editor. This editor is very similar to the one in interactive PC SAS and is the best SAS offers. Here are a few configuration and use techniques that are useful. Use menu "Program, Editor Options", Figure 12.

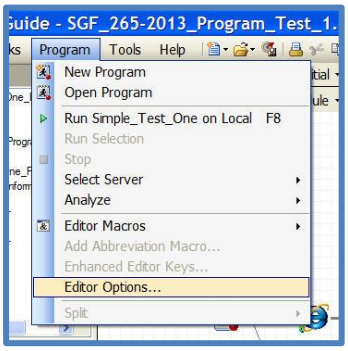


Figure 12. Finding Editor Options.

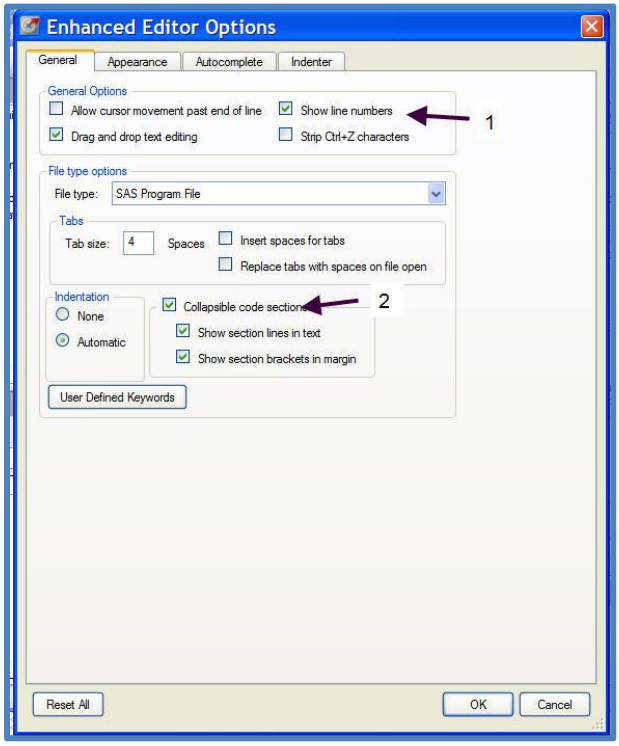


Figure 13. Editor Options To Change.

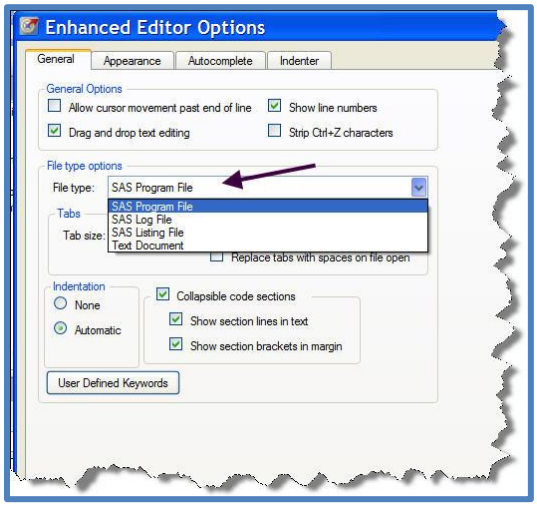


Figure 14. Other File Types the Editor Can Edit.

The 2 options which should definitely be enabled by checking (Figure 13) are “show line numbers” (Item 1) and collapse code section (Item 2). Other filetypes such as logs and listings can also have options set (Figure 14).

SPLITTING EDITING WINDOWS

An edit window may be split into up to 4 separate subwindows to allow indepenent inspection and editing of diffent areas of a file being edited. Each of these windows is fully scrollable. To enable splitting (Figure 15), right click in the file in a white area (1), pick split (2) and then pick “Stacked” (3) to make 2 stacked windows (Figure 16, Items 1 and 2). This is greatly facilitated by dual large screen monitors.

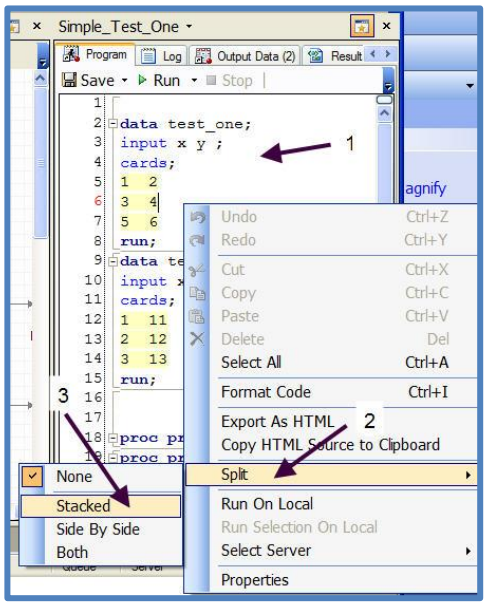


Figure 15. Path to Splitting Editor Windows.

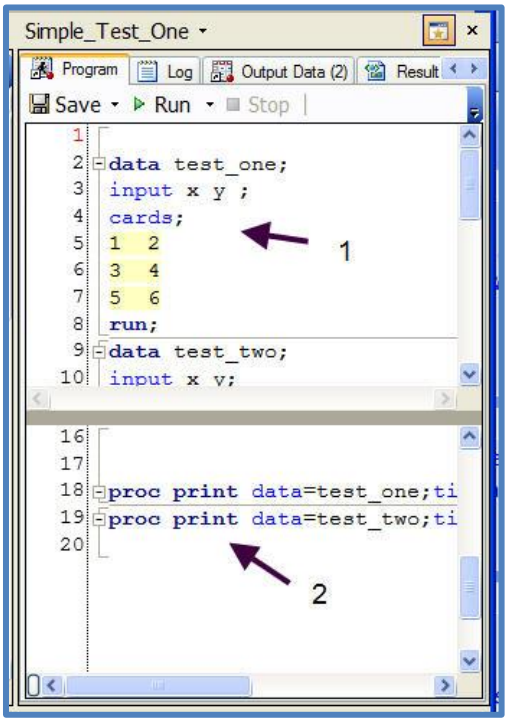


Figure 16. The Appearance of the Editor Window Following Splitting.

COLLAPSING CODE SECTIONS

Code sections may be individually collapsed and expanded by hitting the “+ and –“ signs on the left side of the file (Figure 17).

In addition, keystrokes may be used to collapse and expand all code: (Alt + Ctrl + the number pad minus sign) for collapsing, (Alt + Ctrl + the number pad plus sign) for expanding. This works on notebook computers with limited keyboards that have an additional key such as “fn” to implement numeric pad functions.

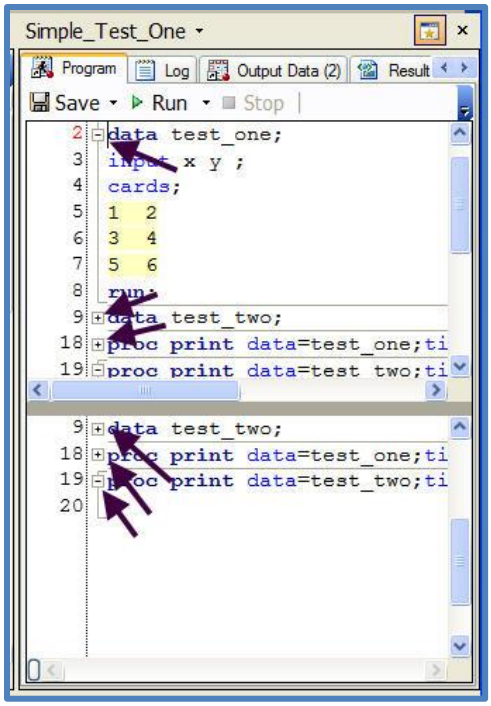


Figure 17. Collapsing and Expanding Code Sections at Arrows.

CONCLUSION

The adaptation of SAS Enterprise Guide by experienced SAS programmers used to working with a file-driven workflow is greatly enhance by setting of several options for Enterprise Guide, setting several options in the enhanced editor and following the workflow logic in this presentation (paper and video).

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CONTACT INFORMATION

Your comments and questions are valued and encouraged. The author has core competencies not only in SAS, but in videography and technical writing. **Inputs on the future use and direction of video for SAS Training and Documentation are sought.** Contact the author at:

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