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Productivity Tips for SAS® Enterprise Guide® Users

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ABSTRACT

SAS Enterprise Guide is a versatile, revolutionary tool for everyone from novice analysts to experienced programmers. This paper focuses on tips for a wide variety of users. Topics include leveraging point-and-click functionality, producing quick ad hoc analyses, organizing SAS processes, increasing speed and accuracy in SAS, automating and streamlining processes, creating attractive reports and graphs, learning how to code what you want and avoiding what you do not, and leveraging new features available in SAS Enterprise Guide. We discuss many quick time-saving tips for analysts and programmers. This paper has something for any SAS Enterprise Guide user and also has great information for someone who has never used SAS Enterprise Guide but is interested in its capabilities.

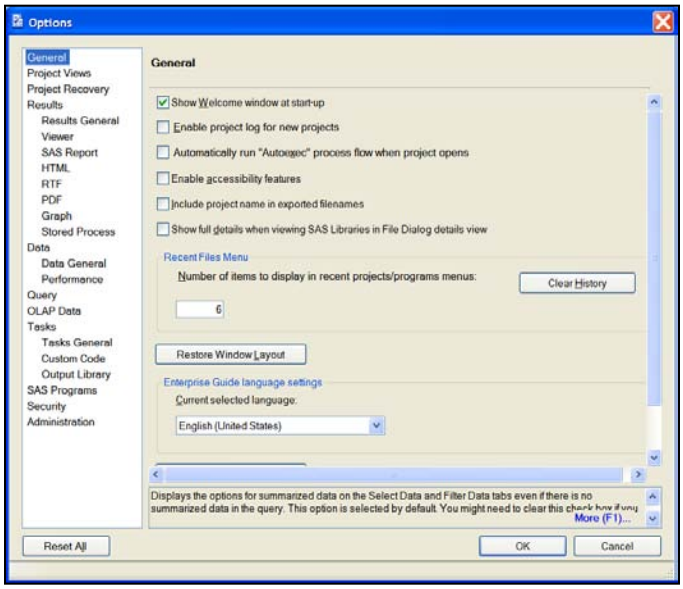
INTRODUCTION

SAS Enterprise Guide is an incredibly flexible tool, with many options, items, and things a user can do. It is highly customizable for individual users. Many options and defaults can be set, based upon someone's EG usage. Exploring EG's options and defaults will increase an EG user's productivity and simplify their processes. Another way to simplify processes and increase productivity is to have Enterprise Guide Projects that are well documented and well organized, on many different levels. Lastly, by leveraging the tools only available in Enterprise Guide (the Query Builder, Tasks, and Wizards) every EG user, from novice analyst to experienced programmer can increase their efficiency in using the software. As we often say at our office, "We have computers, let's use them!"

CUSTOMIZE EXPERIENCE WITH EG OPTIONS

Enterprise Guide (EG) can be almost anything the user wants it to be. It can be anything from quick ad-hoc analysis by a business analyst to an automated, complex, production system that is developed by an expert SAS coder—and anything in between. EG has many different capabilities and options that make this possible. One of the first ways to increase productivity in EG is to configure its options for the user's specific purposes.

Many of Enterprise Guide's options can be set up by going to the top menu bar and selecting **Tools**, **Options**.



Display 1. Enterprise Guide's Options Menu

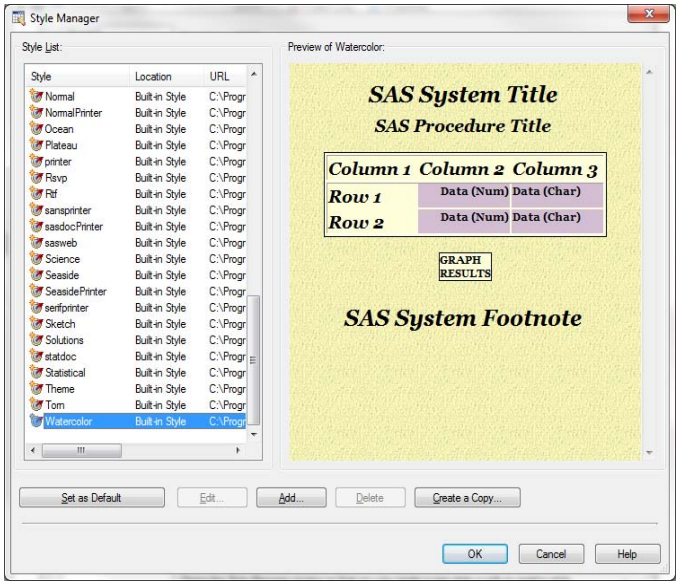
PROJECT VIEWS

The **Project Views** section will show different options that can be set up for how the Project (the entire Enterprise Guide file) looks. One can choose to hide or display logs, code that EG is generating, path names, and more. None of these options are right or wrong. As with many things in Enterprise Guide, it depends on what the user is doing. If

a user is writing code modules from scratch, then they likely want to display the logs on your Process Flow. But if they are a non-programmer, than perhaps showing the logs clutters up your Process Flow, and it will make their life easier to hide them.

RESULTS

Another important set of options that a user can define in Enterprise Guide is **Results**. With these options, one can have EG automatically produce the desired output format (SAS Report, HTML, PDF, RTF, Text output, or any combination of these). The user can also use the **Results** menu to specify the look of any output, including background colors, font colors, logos, table borders, and more. They could also develop a custom style. For example, perhaps a user wants all of their output to be an HTML report that includes their company logo and colors. The user can develop a custom style (with easy point and click!) and use that for their default output format and style.

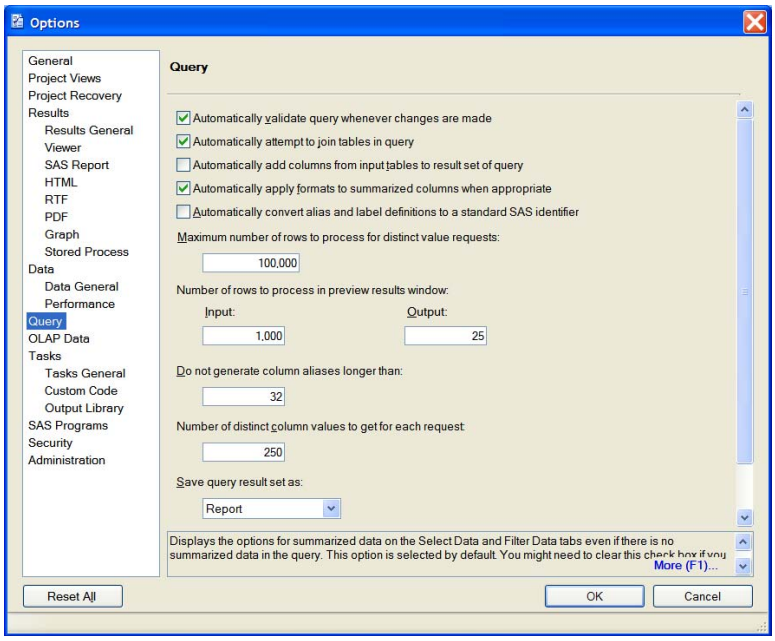


Display 2. Enterprise Guide's Style Manager that can be accessed through Result options

DATA AND QUERY OPTIONS

There are also many default options to configure for Data in Enterprise Guide. Some of these options include things that can improve performance, such as how many rows to scan when importing data or how wide to make columns.

The user can specify query options to improve efficiency, including items to do automatically when a query is run.



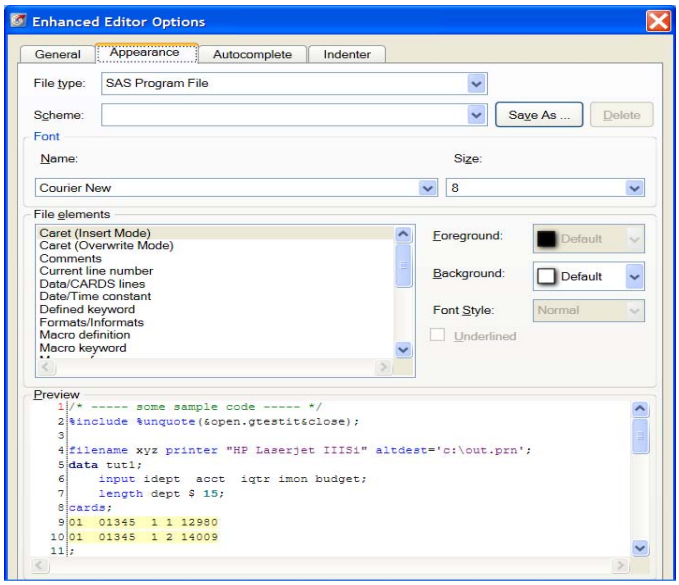
Display 3. Query Options in Enterprise Guide

The user can also insert custom code to run before or after a task or query. One can also change the default Output Library.

EDITOR OPTIONS

To access **Enhanced Editor Options**, click on **Options**, **SAS Programs**. These **Enhanced Editor Options** can also be accessed by going to the menu and clicking **Program**, **Editor Options**.

A SAS programmer can configure general settings, such as whether to show line numbers, tab options, many more general options, autocomplete options, and indenter options. This option menu can also setup many different appearance options, including fonts, colors, and more.

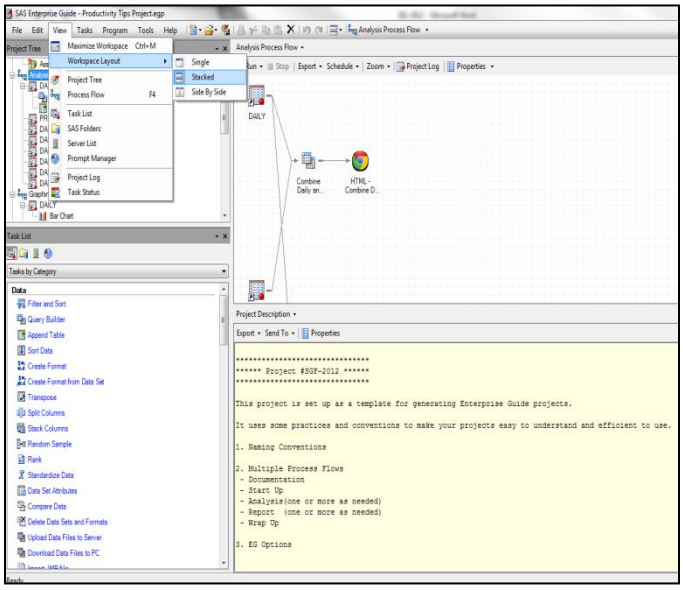


Display 4. Enhanced Editor Appearance options

By custom configuring editor options, including new exciting autocomplete options, display options, and more, any SAS programmer can increase their efficiency.

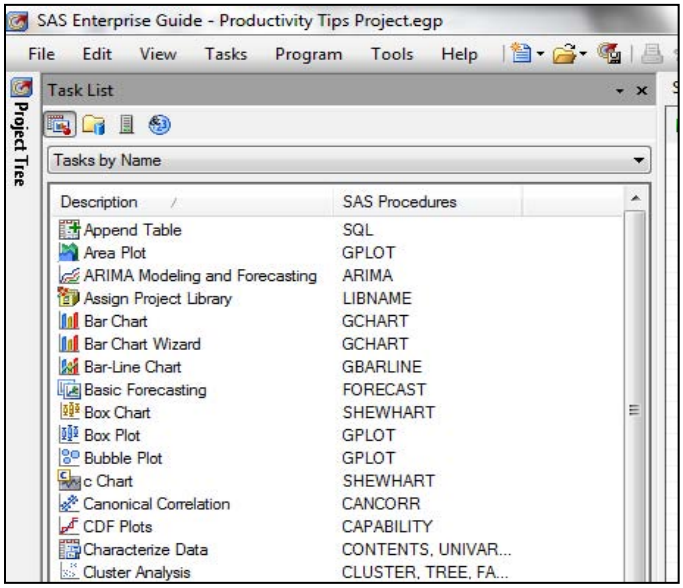
LAYOUT OPTIONS

A user can also specify how to set up all of the windows in Enterprise Guide. Based on how someone is using Enterprise Guide, they may want to change **View**, **Workspace Layout**, which will allow them to display multiple items at once.



Display 5. Example of a Stacked Workplace Layout

An EG user can also use the **View** menu to display or hide your Project Tree, Process Flow, Task List, SAS Folders, Server List, Prompt Manager, Project Log, and Task Status. On the **Task List**, one can also select **Task by Name** to show the name of the EG task, along with the name of the SAS PROC that is being generated behind the scenes.



Display 6. Task List by name, showing EG task, along with the SAS PROC

An Enterprise Guide user can customize many, many defaults to what the user does the majority of the time. When there exceptions, it easy enough to get around the defaults. This reflects just an overview of options. There are also many other options to configure. Users should explore each option to reflect how they are using Enterprise Guide. This may take some time to figure out what is best for each individual, but in the end, it will save a significant amount of time and headaches.

ORGANIZING SAS PROCESSES

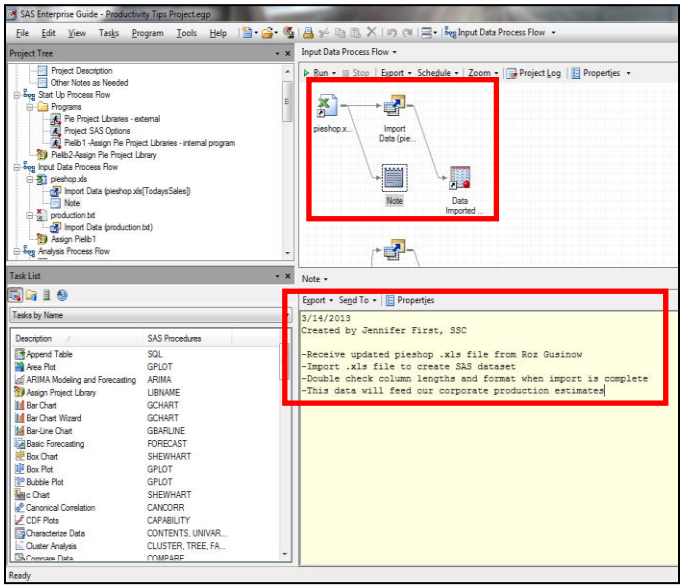
The next important principles for a streamlined Enterprise Guide process are organization and documentation. Enterprise Guide has many moving parts (data, programs, logs, output, and more). It is very important to leverage the tools in EG to create a process that is clean and organized. This will make it easy to maintain, make updates and changes, and pass it along to someone else. Clearly documenting your Enterprise Guide process is also very important. It will allow you to keep track of what EG is doing and why. This is necessary for when you have to fix run errors, make changes, or ask someone else to work on your project.

DOCUMENTATION

Thorough documentation is an essential component of any good SAS process. Unfortunately, it is often overlooked, especially in Enterprise Guide. Whether a user is leveraging Enterprise Guide to write SAS code from scratch or they are using all of EG's point and click tools, it is important to document what is being done, when, by who, and why. Even though all of these seem obvious to the user at the time they are developing the EG project, when they revisit the project, of when someone else works with it, it is rarely that easy to decipher.

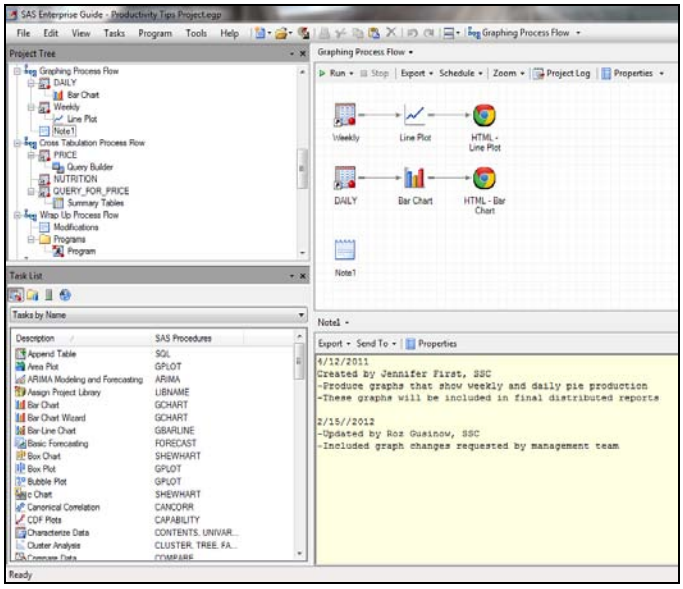
One built in way to document in Enterprise Guide is the **Note**. A Note is a text document where a user can type in any important details. This note will appear as a project node in the Process Flow and the Project Tree. A Note can be associated with a specific data set, task, code module, output, or log. A Note can also be independent of any other node.

A best practice in Enterprise Guide is to create a Note linked to each task used in the Project. The note should contain the what, who, when, and why of the task. It is quick to do, and it will save time in the long run. To create a Note associated with a task, click on the task. Then, from the **File** menu, click **New**, then **Note**.



Display 7. Note associated with a task that documents the task

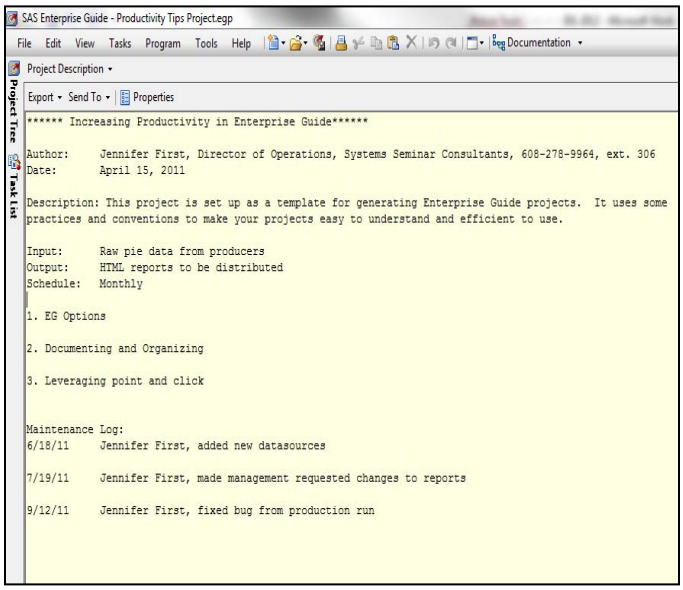
It is also a good idea to have notes to document overall pieces of your Project. These notes can explain the purpose of multiple tasks working together, including dependencies, and the overall purpose of the process. You may have one overall note per Process Flow.



Display 8. Note for overall Process Flow documentation

Finally, one should have documentation for the overall Project, and the first way to do this is to use good, consistent naming conventions. Enterprise Guide will use default names like 'WORK.QUERY_FOR_DAILY1' and 'Calculation'. Choose meaningful names, assign variable labels, and use good default formats for numeric fields. All of these are good general SAS practices. It can be easy to overlook them in Enterprise Guide; however, they are very important and are self-documenting. This applies to data, variables, output, tasks, programs, and process flows.

Another great way to document the overall Enterprise Guide project is to create a Process Flow just for documentation. This could include overall system documentation, maintenance logs, run time instructions, and wrap up instructions. All of these can be written in a notes component.



Display 9. Example of overall process documentation

Of course, the same rules still apply for documenting code that a user writes! Use a header box and change log for each program. Comment as you develop code (or even before) but don't wait until after. Especially focus comments on difficult code, such as complicated calculations. Remember, especially in Enterprise Guide, a non-programmer may need to read and decipher this code.

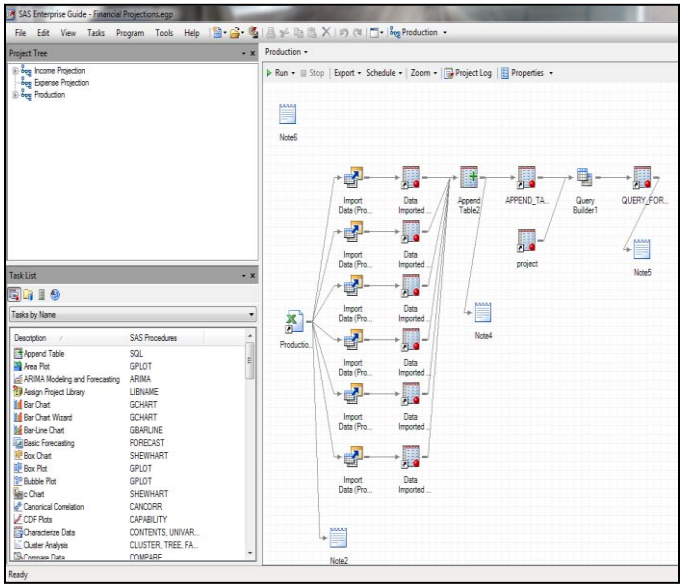
MULTIPLE PROCESS FLOWS

Imagine that an Enterprise Guide project is a file cabinet. An EG user could stuff all of their papers in the cabinet in a random order, with no regard for date, category, or anything else. It would be a quick, easy task to get everything off the user's desk. But when they revisit the cabinet in a week, a month, or a year, it will be impossible to find anything or know how things fit together. Not to mention how the user's coworker would feel if they had to go in the cabinet to find something!

Luckily, in an Enterprise Guide project, you can use a "folder" equivalent – the **Process Flow.** The Process Flow is just like a folder that can hold multiple data sets (spreadsheets that you import into SAS, SAS datasets, connections to your company's enterprise data warehouse, and more). The Process Flow can also hold all of the tasks you perform on this data, any programs you write, output, logs, and notes.

So, just like a file cabinet, we can stuff all of the components of our SAS processes into one messy file drawer. Or, we can create multiple Process Flows (just like our file folders!) to stay organized. Of course, how many Process Flows you create will depend on the complexity of your process, company standards, and your personal preferences.

One way to organize your Process Flows may be according to logical breaks. For example, if a EG user is developing a Financial Projection system, they may want to break their project up into 3 Process Flows: Income Projections, Expense Projections, and Production Projections. Each of these process flows will have its own data, tasks, code, output, and notes. It is easy to keep track of and make changes to. This works well for a process that has logical pieces to it.



Display 10. Multiple Process Flows organized by functional breaks.

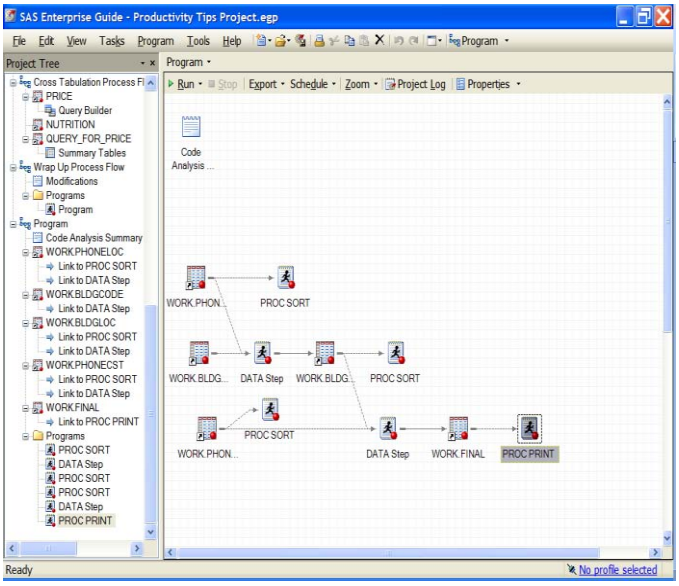
One could also organize the Process Flows based on a system level and how the process will be run. Here is an example of this Process Flow breakdown. In this example, each bullet is a separate process flow:

1. Overall System Documentation
2. Startup Processes, including Assigning Libraries and Setting Options
3. Data Import, Data Cleanup, Data Preparation
4. Preliminary and Exploratory Analysis
5. Final Analysis
6. Graphing and Reporting
7. Production, Scheduling, and Distribution
8. Wrap-Up Documentation

Regardless of how one decides to break a process up into multiple Process Flows, keeping things in neat "file folders" will greatly simply the Enterprise Guide project.

PROCESS FLOW ORGANIZATION

It's also very useful to have each Process Flow organized and easy to read. Enterprise Guide automatically arranges each component of the Process Flow. This option can be nice to start off with and let EG do the work. But once a user starts adding more and more pieces, they may want to turn off **Auto Arrange.** To do this, the user can simply right-click on the Process Flow, and uncheck the **Auto Arrange** option. Then one can drag around any of the items in the Process Flow to make it easier to read and in the order that the user would like.



Display 11. Example of a well organized process flow

Creating an Enterprise Guide Project that is documented and organized is central to the success of a process. It is often easy to take shortcuts in the short term to rush and get something done. However, putting a small amount of time into this area will yield great results long term. Even if a user is developing an ad-hoc process, consider that someone may need to create a similar process down the road and could reuse part of what the user is developing.

LEVERAGING POINT AND CLICK FUNCTIONALITY

Enterprise Guide was designed to simplify the life of a SAS user. So, while many users only use SAS Enterprise Guide as a code editor, there is a whole other world of things to do in Enterprise Guide, using just the mouse. These point and click tools are useful to new SAS users but are also provide incredible time savings and simplification to expert SAS programmers.

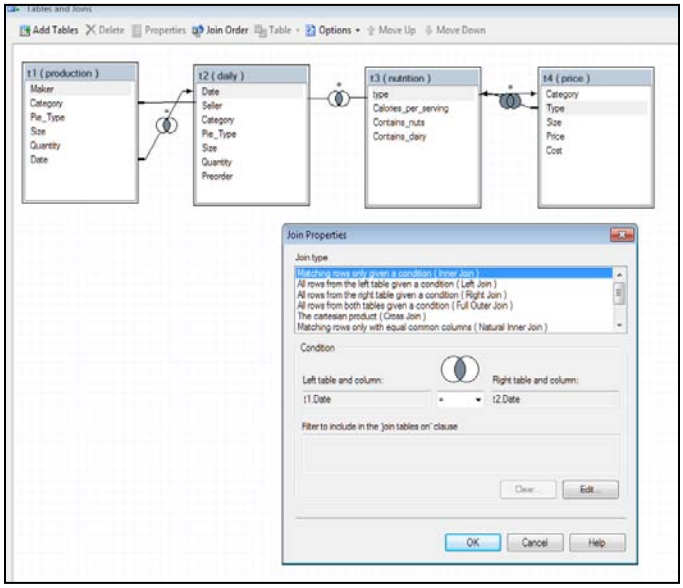
QUERY BUILDER

Enterprise Guide's Query Builder is arguably its most powerful tool. It has incredible functionality, all within one task. Here is a partial list of some of the things the Query Builder can do:

- Join tables
- Select variables
- Filter and data
- Compute columns
- Set up prompts
- De-dup observations
- Add titles, footnotes
- Limit output

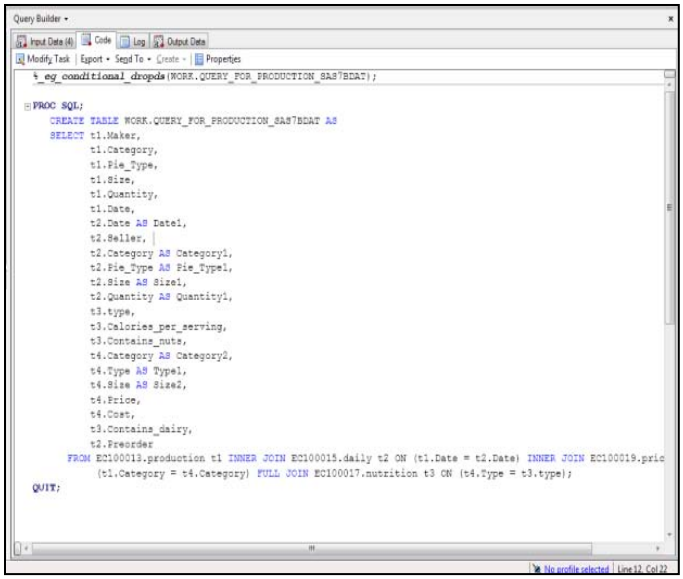
Joining Tables

The Query Builder can join up to 32 tables at once. The whole process is completed in an easy to use, point and click interface. Each table that has been added appears in the **Tables and Joins** window. Underneath each table name is a complete list of the table's variables. EG will guess at join keys (if there are similar variables names between tables). The user can also manually specify join keys. The Query Builder can use multiple join keys as well. The user doesn't need to worry about correctly spelling variable names correctly. The interface also includes many different join types, complete with small, descriptive Venn diagrams.



Display 12. Joining multiple tables in the Query Builder

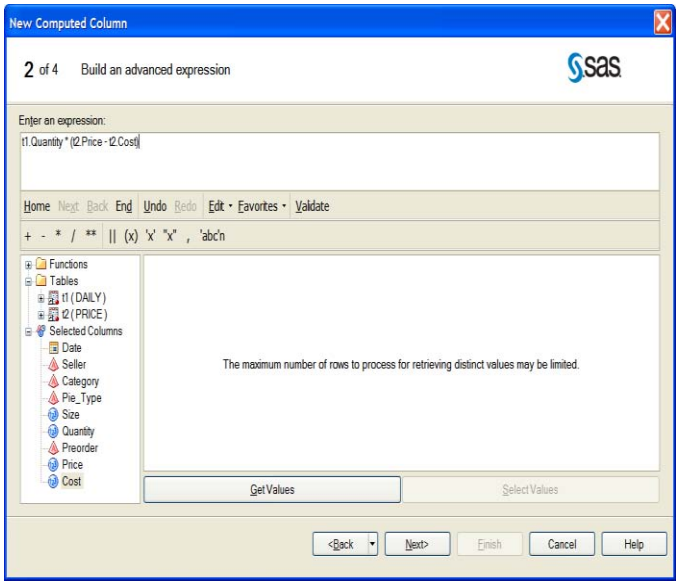
It is very simple to join multiple tables, with multiple variables, in fraction of the time it would take most programmers to code it. The Query Builder is also generating code behind the scenes. So, one can leverage the query builder and grab the code to modify later if needed.



Display 13. Code generated by the Query Builder

Computing New Columns

Another item that can easily done in the Query Builder is to compute new columns. This can include basic or advanced expressions, functions, or recording. For example, we can use the **Expression Builder** to add a new column, called Net that equals Quantity * (Price – Cost). This column can then be used in the Query, just as any other of the original columns.

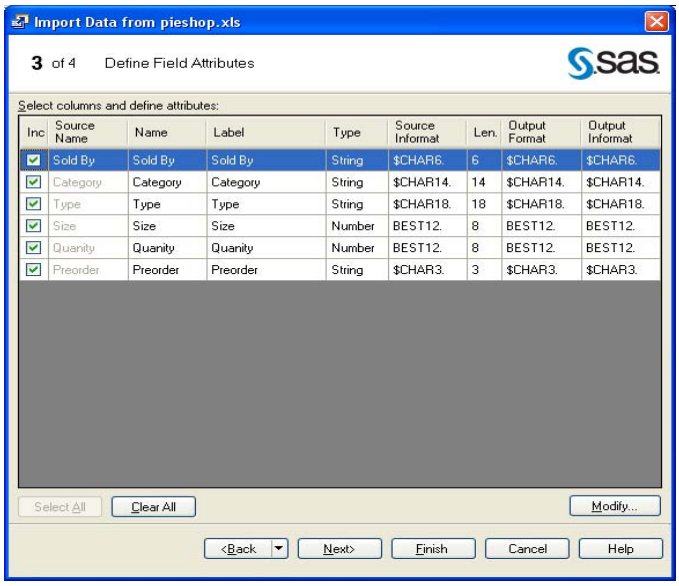


Display 14. Computing new columns in the Query Builder

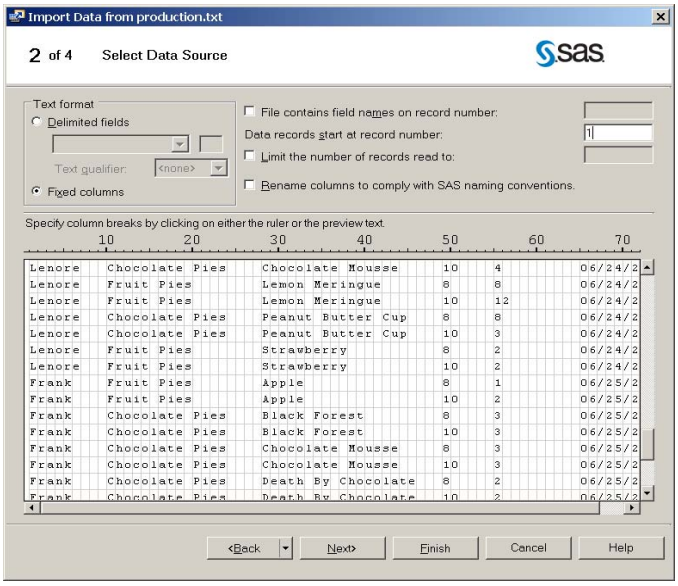
Importing Data

Enterprise Guide's wizards also do a great job with importing data, including databases, spreadsheets, SAS data, and text files. Files that had previously taken extensive amounts of coding and perhaps cumbersome infile statements are all just a few clicks away. It is also very straightforward to set column attributes (including labels, lengths, and formats), assign variable names, and other options.

Productivity Tips for SAS Enterprise Guide Users, continued



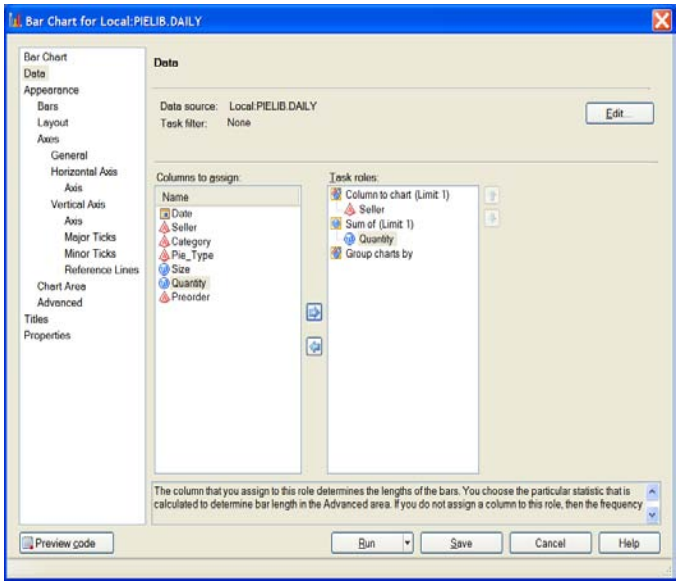
Display 15. Importing Microsoft Excel data into Enterprise Guide



Display 16. Importing a fixed width text file, just by dragging a ruler!

Easy to create graphs

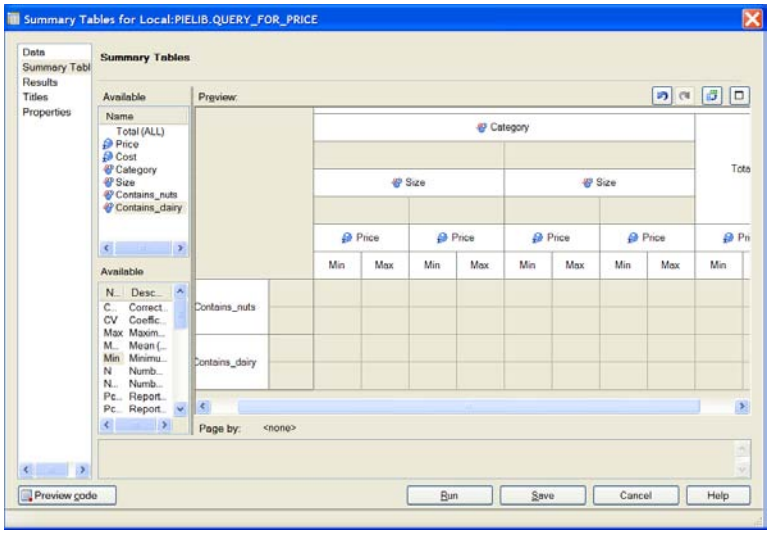
Creating graphs from SAS coding can often be time consuming and cumbersome. Especially if one doesn't do it very often, it is easy to forget the syntax. In the past, many SAS users have even exported their results to Excel to create their graphs. The graph interface in Enterprise Guide is so incredibly easy to use, that it opens up a whole new world of easy graphical representations of data. Not only is it easy, but it will also take a fraction of the time. It is simple to pick from any graph type one can imagine. The user can specify which colors to chart, titles, color, labels, annotations, and more.



Display 17. Bar Chart Task in Enterprise Guide

Quick view of PROC Tabulate report layout

Enterprise Guide users can also leverage the tasks to create processes that are difficult to code. A common favorite among SAS programmers using Enterprise Guide is the Summary Tables Task (generates PROC TABULATE code). Not only does this task have a tab to assign variable roles, it also has a report preview window where the user can drag and drop their preferences for one or two dimensions, concatenation and crossing, analysis and classification variables, and statistics. It is also very simple and incredibly easy to use.



Display 18. Summary Tables Task (PROC TABULATE)

Every user, no matter how comfortable they are with coding should explore EG's tasks and wizards. It will increase productivity and accuracy as the user can code what they want and avoid what they don't.

CONCLUSION

Analysts and programmers use software because it makes their job easier and enhances what they are able to do. There is no software that does these things more than SAS Enterprise Guide. There are a multitude of tools in Enterprise Guide that can be used to simplify SAS processes. Between all of the software's options and its exemplary user interfaces, SAS users can certainly increase their productivity. Even though Enterprise Guide can do a great deal of the heavy lifting, it is important to remember good systems practices, including good organization and documentation. All of these things will increase our productivity as Enterprise Guide users.

ACKNOWLEDGMENTS

We would like to thank our fellow enthusiastic Enterprise Guide programmers, Thomas Miron, Rosalind Gusinow, and Benjamin First.

RECOMMENDED READING

- The Little SAS® Enterprise Guide Book
- http://blogs.sas.com/content/sasdummy/
- http://www.sys-seminar.com/newsletter

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