

## Best Practices in SAS® Enterprise Guide®

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### ABSTRACT

This paper provides an overview of how to create a SAS® Enterprise Guide® process that is well designed, simple, documented, automated, modular, efficient, reliable, and easy to maintain. Topics include how to organize a SAS Enterprise Guide process, how to best document in SAS Enterprise Guide, when to leverage point-and-click functionality, and how to automate and simplify SAS Enterprise Guide processes. This paper has something for any SAS Enterprise Guide user, new or experienced!

### INTRODUCTION

SAS Enterprise Guide is an incredibly flexible tool, with many options, items, and ways a user can leverage the tool. This paper should have something for everyone: definitions, options, organization and documentation, leveraging point and click, graphing and reporting, tips and best practices, and how one should be using EG.

### WHAT IS SAS ENTERPRISE GUIDE

Enterprise Guide is a great tool for the SAS novice. New users can immediately begin working with Enterprise Guide projects, tasks, and wizards with no previous SAS experience. They can perform analyses and queries and create reports that would normally require extensive knowledge of SAS. Beginners can focus on the content of analysis rather than the details of coding.

Enterprise Guide is also a great tool for the SAS Expert. Experts can avoid repetitive or trivial coding by using Enterprise Guide for simple coding tasks. They can modify the automatically generated code and use it as a springboard for more complicated programs. Experienced programmers can also devote less time to searching for minor syntax errors.

### ORGANIZATION AND DOCUMENTATION

An organized and documented EG project is easier to understand, easier to debug and fix errors, easier to maintain, easier to make updates and changes to, and easier to pass it along or share with someone else.

### PROJECT DOCUMENTATION

It is very helpful to have a process flow just for overall project documentation. This will make your project easy to pass on and maintain. It could contain system documentation, maintenance logs, run time instructions, and wrap up instructions.

Enterprise Guide notes are a great way to produce documentation in Enterprise Guide. They are a text document that will appear as a project node in the Process Flow and the Project Tree. Notes can be associated with a data set, task, code module, output, or log or can be independent. Notes linked to a task should include what, who, when, and why of the task. A user can also use notes to explain the purpose of multiple tasks working together, including dependencies, and the overall purpose of the process. It is also helpful to have one overall note per Process Flow or to document overall pieces of your Project.

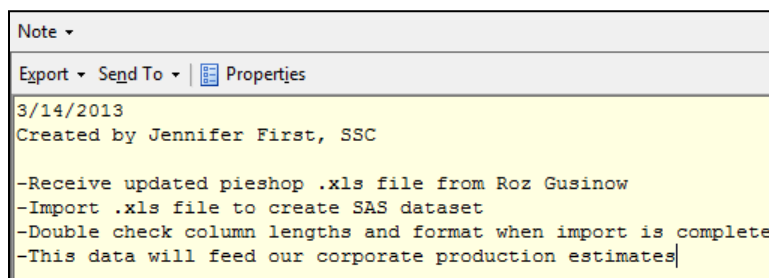


Figure 1: Example of a note in SAS Enterprise Guide

## **NAMING CONVENTIONS**

Good, consistent naming conventions are self documenting. 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. This applies to data, variables, output, tasks, programs, and process flows.

## **CODE DOCUMENTATION**

Always include documentation in your code! 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**

You can use a "folder" equivalent in Enterprise Guide – the Process Flow. The process flow can store many data sources, tasks, code, output, logs, and notes in a logical way in separate process flows.

### **Logical Breaks**

For example, a user wants to break up a financial projection system into 3 Process Flows: Income Projections, Expense Projections, and Production Projections. Each process flow has its own data, tasks, code, output, and notes. It is easy to keep track of and make changes to. This approach works well for a process that has logical pieces to it.

### **Functional Breaks**

This approach organizes the process flows on a system level and how the process will be run.

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

## **PROCESS FLOW ORGANIZATION**

Each Process Flow should be organized and easy to read. Enterprise Guide automatically arranges each component of the Process Flow. This option can be turned off. Then the user can drag around any of the items in the Process Flow to make it easier to read and in the order they want.

## **WHY DOCUMENTATION AND ORGANIZATION ARE CRITICAL**

An EG Project that is documented and organized is central to the success of a process. Even for ad-hoc processes, someone may need to create a similar process down the road and could reuse part of what the user is developing. It is easy to take shortcuts in the short term to rush and get something done. Putting a small amount of time into this area will yield great results long term.

## **LEVERAGING POINT AND CLICK FUNCTIONALITY**

Enterprise Guide was designed to simplify the life of a SAS user. Many use EG as a code editor, but there is a whole other world of things. The point and click options are useful to new SAS users but are also provide incredible time savings and simplification to expert SAS programmers.

## **EXCEL IMPORT DATA WIZARD**

This wizard allows the user to import and modify data-drop fields, change variable attributes, which worksheet or cells to import, and more. This can be done all without any coding!

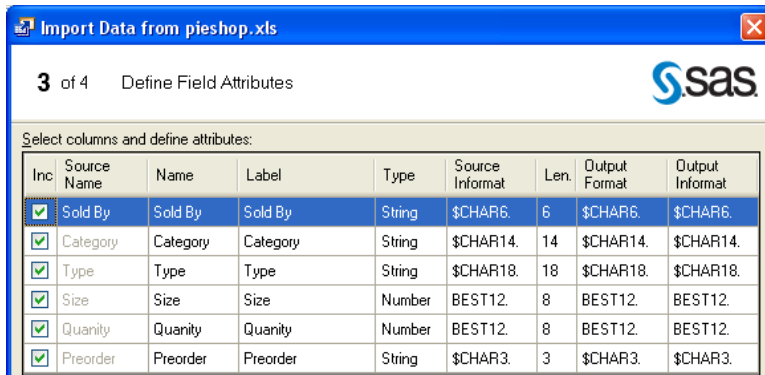


Figure 2: The Import Excel Wizard

### IMPORTING FIXED WIDTH DATA

The wizard for importing text data is also very straight forward and helpful. If the data is fixed width, highlight Fixed Columns. Click the ruler above the sample text to denote the column divisions.

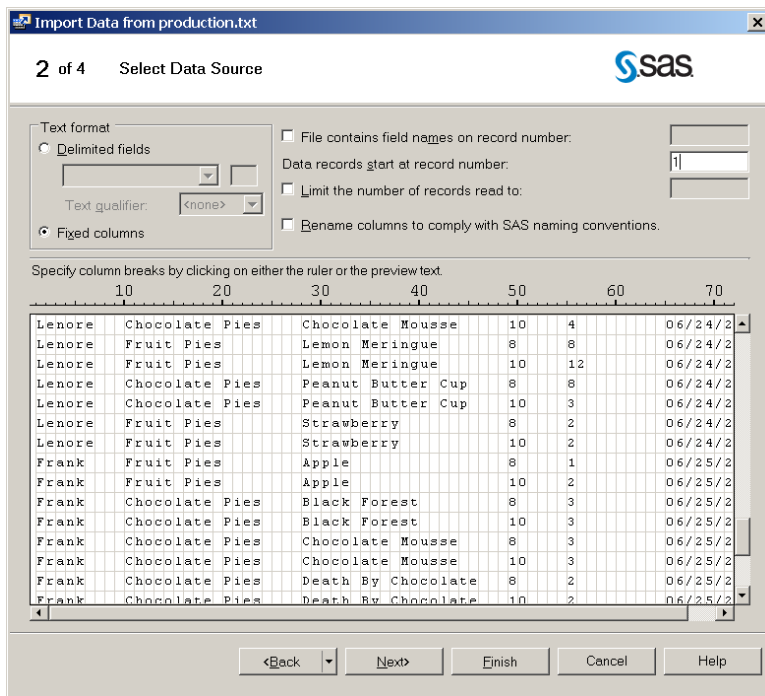


Figure 3: Importing Fixed Width Data

### IMPORTING DELIMITED TEXT DATA

To import delimited data, the user simply has to specify what the delimiter is. The user will also get a preview of the data.

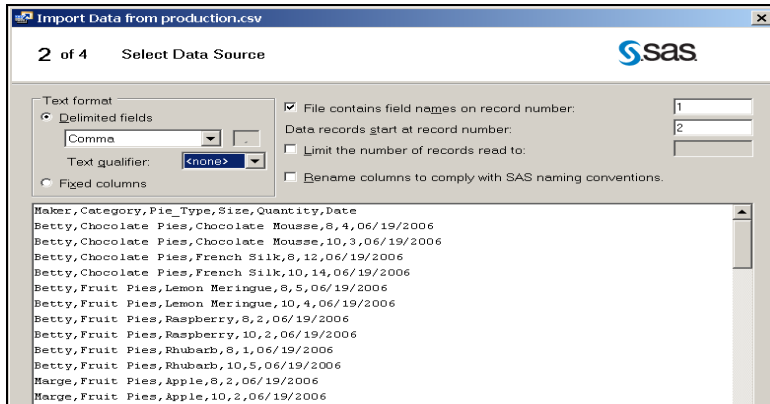


Figure 4: Imported Delimited Text Data

## MY FAVORITE TASK – THE QUERY BUILDER!

The Query Builder is a graphical way analysts can join tables, select variables, filter data, sort data, change data sources, compute columns, set up prompts, de-dup observations, change query options, add titles and footnotes, limit output, and more. The Query Builder is intuitive, easy to understand and use, and eliminates many coding errors. Like other tasks, the Query Builder builds code that can be reused and modified. Using this task to do queries can greatly increase efficiency.

## SUMMARY TABLES: PROC TABULATE

Proc Tabulate can be overwhelming code to write, especially if a user doesn't do it in a regular basis. The Summary Tables task is an extremely intuitive drag and drop interface that allows a user to slice and dice data into all different kinds of summary tables. The variables and statistics can be arranged on the report in the Preview Area. It can use one or two dimensions, concatenation and crossing, analysis and classification variables, and many different statistics.

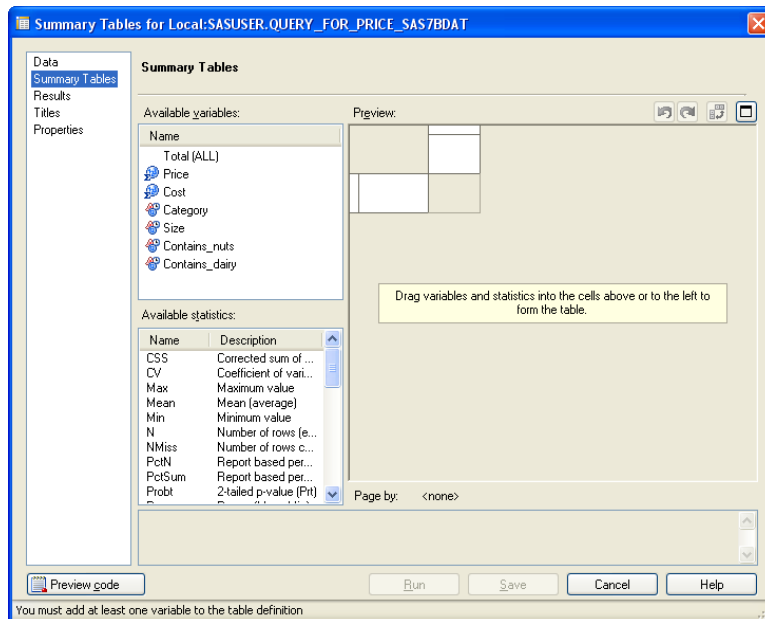


Figure 5: Summary Tables in SAS Enterprise Guide

## CHARACTERIZE DATA

One of the first tasks for any analyst is to learn about their data. This can be done manually, but leveraging the Characterize Data task does a great deal of this with just a few clicks. What variables do the data sets contain?

What does the data look like? Characterize Data Wizard creates: summary reports, graphs, frequency SAS data sets, and univariate SAS data sets.

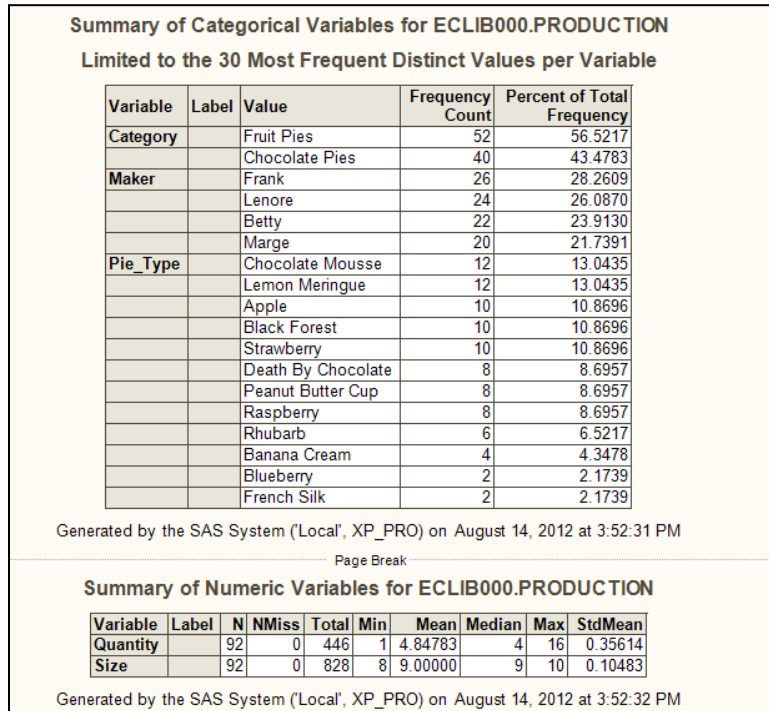


Figure 6: Characterize Data Summary Report

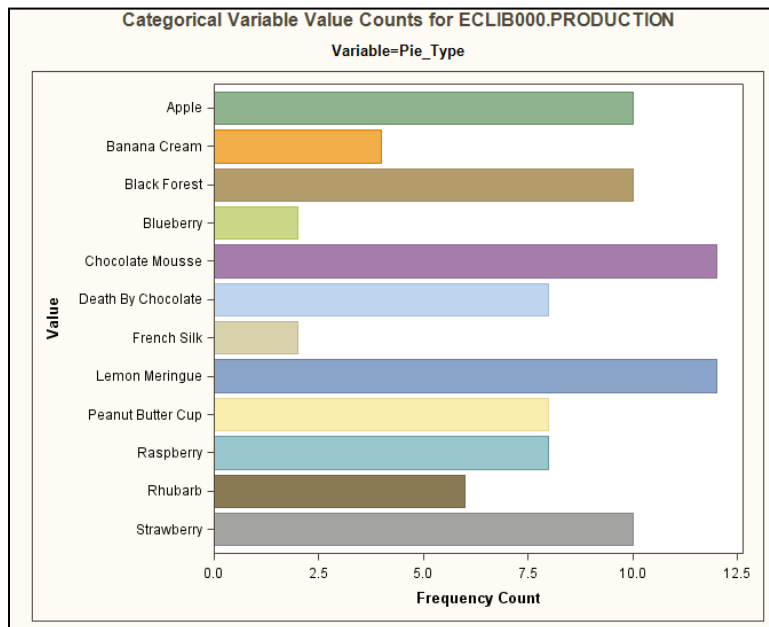
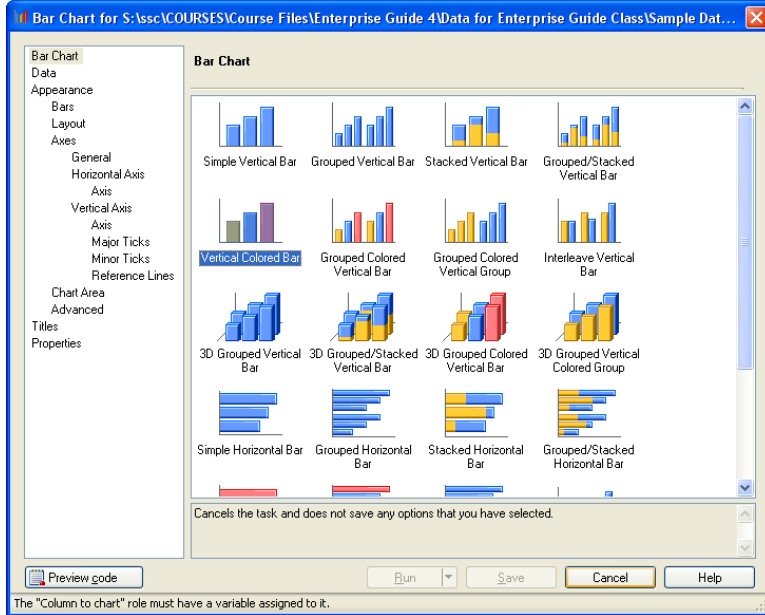


Figure 7: Characterize Data Graphs

## EASILY CREATE USEFUL, BEAUTIFUL GRAPHS

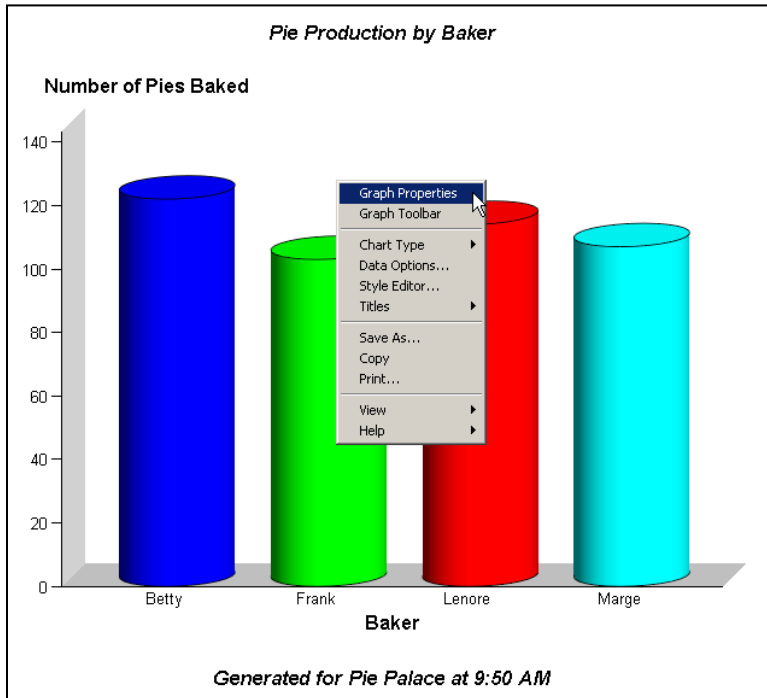
Creating graphs is simple with EG's interface. There is no cumbersome SAS/GRAPH syntax, and graphs can be completed in a fraction of the time that it would take to code them. It is all very easy point and click. Graphs can

include bar charts, pie charts, line plots, scatter plots, area plots, donut charts, bubble plots, contour plots, box plots, and more.



**Figure 8: Graph Task in SAS Enterprise Guide**

Graphs can also be interactive. The user can change colors or change to a pie graph without rerunning the data.



**Figure 9: Interactive Graph in SAS EG**

## MANAGING TABLES

Many Tasks Leads To Many Intermediate Tables. It is very useful to keep these tables in a permanent library because the project can be restarted in the middle (instead of waiting possibly hours for tables to be recreated that haven't changed). The intermediate tables are also useful for testing and debugging.

## ENTERPRISE GUIDE PROJECT BACKUP

EG projects are stored as a single binary file (not plain text). It is important to always back up the .egp file to plain text with "Export All Code..." option.

## CONCLUSION

### HOW SHOULD AN ANALYST USE EG?

It will decrease errors and increase productivity to use the GUI for the majority of tasks in Enterprise guide. Then the user can learn how to program as necessary. They can dig into programming for debugging, using macro variables, exploring the world of SAS functions, and understanding code that others have written.

### HOW SHOULD A PROGRAMMER USE EG?

Programmers shouldn't be afraid to use EG features! The point and click can increase efficiency, even if the user is an expert programmer. EG tasks minimize spelling and naming ambiguities. The line is blurring between coding and GUI with new editor options, and it is a good thing for all of us.

## RECOMMENDED READING

- *The Missing Semicolon*: [www.sys-seminar.com](http://www.sys-seminar.com) – *Enterprise Guide Tips, Papers, and Webinars*
- *Chris Hemedinger-The SAS Dummy* <http://blogs.sas.com/content/sasdummy/>

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