



## SESUG Speaker Sharing Program

### Presentation Titles, Abstracts and Author Bios

#### Program Goals:

- Speaker sharing is one of the many ways SESUG and SAS support local SAS user groups.
- SESUG and SAS will co-sponsor and provide SAS user groups in the SouthEast a yearly presentation selected from our list of topics and delivered by our SESUG EC featured speakers. Speaker Travel Costs are fully paid by SESUG and SAS.

#### Program Specifics:

- Local and in-house SAS user groups in the SESUG region (Alabama, Florida, Georgia, Kentucky, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, Washington DC, Puerto Rico) are eligible to participate.
- Sponsorship is limited to one speaker each calendar year. Speakers **do** facilitate requests to provide more than one presentation at a User Group Meeting.
- SESUG fulfills local SAS user group requests for speakers based upon speaker availability and reasonable travel costs.
- In support of the SESUG Speaker Sharing Program, SAS provides matching funds to assist SESUG in maximizing the effectiveness and coverage of the Speaker Sharing Program.

#### Requesting a Speaker:

- Please plan as far in advance as possible so that SESUG can accommodate your request.
- After reviewing the available topics, speakers, and speaker bios **BELOW**, select your “top three choices” of speakers, and email your request to [Bob Bolen](#). Please include:
  - Desired **date / time / location** of meeting
  - User Group name and contact information
  - **Three** preferred speakers, and the presentation titles of interest.
- SESUG will review your request and, if fulfilled, SESUG will provide you with confirmation of:
  - Speaker / title(s)
  - Dates
  - Travel arrangements.
- NOTE: Requests are fulfilled based on speaker availability and reasonable travel expenses.



## SESUG Speaker Sharing Program

### **Alphabetic List of Presentation Titles**

- [A Cup of Coffee and PROC FCMP: I Cannot Function Without Them](#) Peter Eberhardt
- [Are Your SAS® Programs Running You?](#) Marje Fecht
- [Building the Better Macro: Best Practices for the Design of Reliable, Effective Tools](#) Frank Dilorio
- [Creating Easily-Reusable and Extensible Processes: Code that Thinks for Itself](#) Marje Fecht
- [Demystifying the SAS® Macro Facility - by Example](#) Marje Fecht
- [Dictionary Tables and Views: Essential Tools for Serious Applications](#) Frank Dilorio
- [Easier than You Think: Creating Maps with SAS® Enterprise Guide®](#) Stephanie Thompson
- [Evaluating Sample Code for an Interview](#) Stephanie Thompson
- [Four Thousand Reports Three Ways](#) Stephanie Thompson
- [Getting Personal but not too Personal](#) Stephanie Thompson
- [Getting Your Data into SAS®](#) Stephanie Thompson
- [Graphing the Easy Way with SAS® Enterprise Guide® \(or How to Look Good With Less Effort\)](#) Stephanie Thompson
- [Labels, Labels, and More Labels \(note: 30 minutes\)](#) Stephanie Thompson
- [Making your SAS® Data JMP® Through Hoops](#) Mira Shapiro
- [Managing your SAS® Assets](#) Stephanie Thompson
- [Metadata 101: A Beginner's Guide to Table-Driven Applications Programming](#) Frank Dilorio
- [More than Models: The Data Mining Team](#) Stephanie Thompson
- [New to SAS® and New to Programming? What You Need to Do Before Typing Code](#) Stephanie Thompson
- [Point-and-Click Programming Using SAS® Enterprise Guide®](#) Mira Shapiro
- [Quick and Dirty Excel Workbooks Without DDE or ODS](#) Andrea Wainwright-Zimmerman
- [Rules for Tools - The SAS® Utility Primer](#) Frank Dilorio
- [SAS® Enterprise Guide® 4.3: Finally a Programmer's Tool](#) Marje Fecht



## SESUG Speaker Sharing Program

[Talking Past Each Other? How to Communicate with Medical Writers When Preparing Clinical Research Manuscripts for Journal Submission](#) Stephanie Thompson

[The SAS® DATA Step: Where Your Input Matters](#) Peter Eberhardt

[The SAS® Debugging Primer](#) Frank Dilorio

[The SAS® Hash Object: It's Time To .find\(\) Your Way Around](#) Peter Eberhardt

[Things Dr Johnson Did Not Tell Me: An Introduction to SAS® Dictionary Tables](#) Peter Eberhardt

[THINK Before You Type... Best Practices Learned the Hard Way](#) Marje Fecht

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[Why the Bell Tolls 108 times? Stepping Through Time with SAS®](#) Peter Eberhardt



## SESUG Speaker Sharing Program

### **Author Bios**

#### **Frank Dilorio**

Frank Dilorio is President of CodeCrafters, Inc., a consulting firm specializing in pharmaceutical applications and SAS training.

A SAS programmer since 1975, Frank is the author of the popular (almost 30,000 copies sold) "SAS Applications Programming: A Gentle Introduction" and "Quick Start to Data Analysis with SAS." He has written over 50 papers and is a frequent speaker at local, regional, and international SAS conferences.

Frank is past President of the SouthEast SAS Users Group, and was co-chair of its 1994 and 1996 conferences and in 2007 was a co-founder of the Research Triangle CDISC Users Group. In 2006, he was one of six recipients of the SAS Silver Circle Award.

#### **Peter Eberhardt**

Peter is a regular contributor to the SAS community as a speaker and conference organizer. He has spoken at local user groups across Canada, in the U.S., and the Caribbean; in addition he is a regular presenter at SESUG and other regional user groups as well as Global Forum. At SESUG he is active as a section chair and as the Academic Chair for SESUG 2012 in Cary N.C.

#### **Marje Fecht**

Marje Fecht is a Senior Partner with Prowerk Consulting, and has been a SAS software user since 1979. Her initial use of SAS focused on statistical applications and she has been teaching and using computer software and SAS for over 30 years. She developed and taught a broad curriculum of courses for SAS Institute including Applications Development, Data Management and Access, Graphics, Reporting, Macros, and Statistics.

Most recently, her consulting work has focused on developing efficient systems for reporting, analysis, and Business Intelligence at major financial and retail organizations. In addition to her focus on developing hands-free production coding techniques, she enjoys sharing tips for graphical representation of data as well as applications development.

Marje is a frequent presenter at Users Groups in the US and Canada. She co-chaired SESUG 2006 and 2011 and is SAS Global Forum 2014 Conference chair.

#### **Mira Shapiro**

Mira Shapiro is the Founder and Principal Consultant at Analytic Designers LLC. An analytics professional with more than 25 years of experience using SAS, first in the information technology industry and, more recently, in the healthcare arena.

Mira holds an M.Sc. in public health / biostatistics from the University of Massachusetts at Amherst and a B. A. in statistics / computer science from George Washington University. Mira is active in SAS user groups at the local, regional and, international level. She has been an invited speaker at SAS Global Forum, seminar presenter at the Southeast SAS User Group (SESUG) and will be serving as the SESUG Operations Chair for the conference being held in Florida in October 2013.



## SESUG Speaker Sharing Program

### **Stephanie Thompson**

Stephanie Thompson has over fifteen years experience applying statistical and modeling techniques to business problems in various manufacturing, retail, and academic environments using SAS and other programming languages. She has a strong understanding of data structures, analytical tools, and operating environments. She holds a B.S. in Industrial Engineering from Rochester Institute of Technology and an M.B.A. from St. Bonaventure University.

Stephanie is a SAS Certified Base Programmer for SAS9 and has presented at SESUG, SUGI / SAS Global Forum, NESUG, and local users group events. She is a member of the SESUG Executive Council, has co-chaired various academic sections at SESUG, and is the Academic Program Chair for SESUG 2010.

### **Andrea Wainwright-Zimmerman**

Andrea Wainwright-Zimmerman has been writing computer programs since the 2nd grade and has been programming in SAS for over 15 years. She graduated from Sam Houston State University with a BS in Mathematics and an MS in Statistics. She has been working for Capital One for over 12 years now. In her spare time she sings lead in a female barbershop chorus and is an animal lover and trainer working with 4 cats, 1 dog, 3 horses, and one husband.



## SESUG Speaker Sharing Program

### **Presentation Abstracts (in alphabetic order by presentation title)**

#### **A Cup of Coffee and PROC FCMP: I Cannot Function Without Them**

Peter Eberhardt

How much grief have you put yourself through trying to create macro functions to encapsulate business logic? How many times have you uttered "If only I could call this DATA step as a function"?

If any of these statements describe you, then the new features of PROC FCMP are for you. If none of these statements describe you, then you really need the new features of PROC FCMP. This presentation will get you started with everything you need to write, test, and distribute your own "data step" functions with the new (SAS® 9.2) PROC FCMP. This presentation is intended for beginner to intermediate programmers, although anyone wanting to learn about PROC FCMP can benefit.

#### **Are Your SAS® Programs Running You?**

Marje Fecht ( Co-author: Larry Stewart )

Most programs are written on a tight schedule, using the most accessible knowledge of the programmer. Often the programmer mistakenly assumes that the program will never be used again; five years later the spaghetti code is still in use. While the tasks are accomplished and the results are accurate, the program may not be as efficient as possible and subsequent submissions may require tedious and time-consuming input and modifications.

This presentation looks at typical SAS Code, and then suggests changes to improve the efficiency and maintenance of the programs. If you are a programmer who has inherited code that was written "*many SAS versions ago*", you will benefit from examples of "*updating your code to the current decade*".

This tutorial focuses on maintenance - free, efficient coding techniques so that you can spend your work time being more productive!

Topics include:

- macro coding techniques
- efficient programming tips
- code reduction tricks
- maintenance-free programming suggestions.



## SESUG Speaker Sharing Program

### **Building the Better Macro: Best Practices for the Design of Reliable, Effective Tools**

Frank Dilorio

The SAS® macro language has power and flexibility. When badly implemented, however, it demonstrates a chaos-inducing capacity unrivalled by other components of the SAS System. It can generate or supplement code for practically any type of SAS application, and is an essential part of the serious programmer's tool box. Collections of macro applications and utilities can prove invaluable to an organization wanting to routinize work flow and quickly react to new programming challenges. But the language's flexibility is also one of its implementation hazards. The syntax, while sometimes rather baroque, is reasonably straightforward and imposes relatively few spacing, documentation, and similar requirements on the programmer. In the absence of many rules imposed by the language, the result is often awkward and ineffective coding. Some amount of self-imposed structure must be used during the program design process, particularly when writing systems of interconnected applications. This presentation presents a collection of macro design guidelines and coding best practices. It is written primarily for programmers who create systems of macro-based applications and utilities, but will also be useful to programmers just starting to become familiar with the language.

### **Creating Easily-Reusable and Extensible Processes: Code that Thinks for Itself**

Marje Fecht ( Co-authors: Faisal Dosani, Lisa Eckler )

It's easy to write code that answers only one need. It's more challenging and time-consuming to develop a "hands-off" process that adapts to many needs. In the long run, time and effort is saved by building a modular process with wide applicability.

This presentation investigates the implementation of a framework to help in building efficient and reusable code. We start by looking at design considerations prior to the start of coding, including identifying design patterns and utilizing Metadata driven logic. Then we consider effective ways to split logical sections of code into easily reusable components.

Examples will be presented including

- components of the planning process
- design framework
- key features of flexible code
- macros that enable creating hands off code with minimal intervention.

A basic understanding of SAS® and the SAS Macro Language is assumed throughout the presentation, however the concepts may be beneficial to a wider audience.



## SESUG Speaker Sharing Program

### **Demystifying the SAS® Macro Facility - by Example**

Marje Fecht (co-author: Harry Droogendyk)

The SAS macro facility enables you to apply a wealth of useful, uncomplicated, real-world solutions to enhance your coding pleasure, reduce coding effort, and minimize error. As your business applications inevitably become more complex, the SAS macro facility is indispensable to:

- reduce code repetition
- increase control over program execution
- minimize manual intervention
- create modular code.

Unfortunately, the SAS macro facility is often perceived as confusing, difficult to use, and only really comprehensible by a few long-time macro masochists. This presentation removes the mystery of macros and provides coding tips, macro solutions, and methodologies you can take away and implement immediately.

### **Dictionary Tables and Views: Essential Tools for Serious Applications**

Frank Dilorio ( co-author: Jeff Abolafia )

Dictionary tables were introduced to the SAS System in during the mid-life of Version 6. Laden with information that is often difficult, and sometimes impossible, to get through other means, they still appear to be on the outside of many programmers' Bag of Tricks. This is both perplexing and unfortunate for as we will see in this presentation, once their content and organization is understood, they are readily adapted for a range of applications that "are only limited by your imagination." Indeed, it is difficult to think of a robust, generalized system utility that would not benefit from use of this metadata.

This presentation describes dictionary tables and their associated SASHELP library views. It:

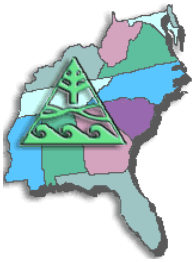
- presents scenarios that show how they can be used
- gives high-level descriptions of some of the more important (a relative term, to be sure) tables
- identifies features of SQL and the macro language that are commonly used when writing programs that effectively use the tables
- shows examples of the tables' use, emphasizing the use of SQL and the macro language interface

The audience should come away from the discussion with an understanding of the tables as well as with a checklist of SQL and macro skills that are required to use the tables most effectively.

### **Easier than You Think: Creating Maps with SAS® Enterprise Guide®**

Stephanie Thompson

Have you ever wanted to display data on a map to add more punch to your analysis? Sometimes seeing things geographically can put things into a completely new perspective. Letting your data tell a story on a map is easier than you might think. A two-step approach with SAS® Enterprise Guide® is all you need. From using supplied shape files right through customizing your graph, this presentation walks you through the process. Some best practices are also included to make sure your customers are impressed. They will never know how easy it really was.



## SESUG Speaker Sharing Program

### **Evaluating Sample Code for an Interview**

Stephanie Thompson

Requesting sample SAS® code from job candidates before an interview is a good way to gauge their level of experience, ability, and style. Once you have reviewed the code, prepare your questions for the candidate. You want to make sure that they 1) wrote the code themselves, 2) understand what they wrote, and 3) are familiar enough with it to explain why things were done the way they were. This presentation will provide you with some guidelines on how to get answers to these questions in an interview. Code samples that I have received over the last few years and the questions that arose will be used as examples. This is also a good time to ask if the candidate can think of another way to accomplish the same task using a different approach. Evaluating work samples can be a way to gain invaluable insight into your candidate's skills and this presentation will help you get the most out of it that you can.

### **Four Thousand Reports Three Ways**

Stephanie Thompson

How do you go about generating over four thousand PDF reports in up to three different versions? When a large, southern research university decided to add up to five optional questions per class section and up to five more questions at the prefix level to their core set of fifteen questions on the student evaluation of faculty survey, it seemed like a project that would never be completed. If the additional questions weren't enough, the reports were being revamped at the same time to improve their appearance for delivery on the web. Each report had a tabular section and two customized box and whisker plots. Thanks to ODBC / SAS Access, PROC SQL, macro, DATA Step programming, PROC GPLOT, goptions, and ODS it all came together. This presentation summarizes how each SAS® component was used and contributed to the completion of the project.

### **Getting Personal but not too Personal**

Stephanie Thompson

So, have you tweeted, friended someone, been dug, used a Wiki, blogged, created a network, or shot a video to post online? No? Maybe you think these tools are just for the youth of today and not for the professionally minded. Au contraire. Social media in the broad sense has a wide range of tools that you as a professional can leverage and benefit from. There are some things to look out for since there is a danger of crossing the line between personal and professional. This presentation covers some of the more common social media sites as well as some tips on what to put out there for the world to see.



## SESUG Speaker Sharing Program

### **Getting Your Data into SAS®**

Stephanie Thompson

Where is your data stored?

- Oracle tables
- SQL Server tables
- Microsoft Access
- Microsoft Excel
- Text file
- All over the place.

Over the years there has been a proliferation of ERP systems and other ways to collect and store data. Many times you need data from different systems to complete a single analysis. Sometimes getting data out can seem like quite a challenge. Luckily, SAS has the capability to access many different types of data but also different ways to do so. This workshop will cover how to use SAS to access data from a variety of sources through both presentation and live demonstration. Some practical tips on which methods work best or are fastest will also be covered.

The following methods to access data will be covered in the workshop:

- SAS libname engine
- PROC SQL
- ODBC
- PROC IMPORT (including the Import Wizard)

### **Graphing the Easy Way with SAS® Enterprise Guide® (or How to Look Good With Less Effort)**

Stephanie Thompson

Have you ever wanted to make some fancy graphs but were intimidated by coding them from scratch? Let Enterprise Guide® do the hard part for you. This presentation will provide a brief overview of Enterprise Guide then walk you through creating different types of graphs. Bar charts, pie charts, scatter plots and more will be created. Once the graphs are done, I'll "borrow" the generated code, put it in another SAS® program, make a few modifications, and then voila - fancy graphs from your program. I will use both the programming interface and Enterprise Guide in this presentation.

### **Labels, Labels, and More Labels**

Stephanie Thompson

SAS® datasets include labels as optional variable attributes in the descriptor portion. Labels are not a nuisance but something that you can get a lot of use out of. Learn how to get the most out of them in your programs. Here are just a few of the topics that will be covered: how labels can make reports more readable, how to permanently or temporarily create or change labels, how to use them in procedures or not use them, and how to extract them into a dataset or a macro variable. Consider this presentation a primer on the variable label.

Note: 30 minute talk



## SESUG Speaker Sharing Program

### **Making Your SAS® Data JMP® Through Hoops**

Mira Shapiro

Longtime SAS users can benefit by adding JMP to their repertoire. JMP provides an easy-to-use and robust environment for data exploration, graphics and analytics. This paper will provide an introduction to JMP 9 with an emphasis on features that SAS users will find useful.

During this presentation, users will learn how to read their SAS data, import Excel spreadsheets, transform their data, explore distributions, create reports and create sophisticated graphics all in the JMP environment. Users will be introduced to the tools within the JMP 9 environment that provide a pathway to quickly learn how to use the product and some of its unique features.

### **Managing your SAS® Assets**

Stephanie Thompson

Hiring talented SAS® professionals can be an expensive proposition. While it is great to get another position for your department, replacing someone can be a real downer. Why did they leave? Was it the work? Did we make a poor hiring decision? Was it just a better opportunity? Could they have been happy here? Maybe they just did not like me.

All of these questions are valid, and you can keep guessing and never really know. As they say, an ounce of prevention is worth a pound of cure. What can you do as a manager to keep your best talent happy and challenged? Keeping those in your department engaged is a big piece of the puzzle.

Not a manager? Well, you're not off the hook either. There are things you can do to help your manager manage you better. I've been on both sides of this fence, and this presentation per will talk about some of the things that will help keep everyone happy. Think of your company's SAS talent as SAS assets!

### **Metadata 101: A Beginner's Guide to Table-Driven Applications Programming**

Frank Dilorio

Any programmer dealing with frequent changes to program specifications is some one who has to cope well in frustrating, time-consuming and error-prone challenges. Changes to report headers and footers, dataset contents, and other aspects of client deliverables have to be communicated effectively and implemented correctly.

Metadata and metadata-driven utilities are effective tools to reduce or entirely eliminate many of the programming and management problems inherent in traditional project work flows. This presentation discusses the nature of metadata, some of its design criteria, and the notes the need for the all-important applications that make it usable throughout the project life cycle. It also presents a simple case history, presenting traditional, "before" code and work flow, followed by revised, metadata-driven coding. The audience should come away with an appreciation of the power of metadata-driven applications and, hopefully, ideas of how these techniques can be implemented in his/her workplace.



## SESUG Speaker Sharing Program

### **More than Models: The Data Mining Team**

Stephanie Thompson

Gathering data from various sources, preparing it for modeling, inputting, partitioning, testing various models, choosing the best, presenting it to your boss, then failure? Data mining is about more than just variables and models. Developing an understanding of each variable may take more than just running some summary statistics and deciding if it is ordinal or nominal. The need for comprehension is even more critical when the data you use are from different areas of the organization. Putting together a group of subject matter experts in the early phases of a data mining project can make a big difference in the outcome of your project. They can help you eliminate extraneous or duplicative variables and put others in context to help you better understand and interpret results. This presentation will discuss how subject matter experts can aid in data mining using examples from several actual projects. Learn how to leverage the knowledge to derive a better conclusion and avoid costly errors.

### **New to SAS® and New to Programming? What You Need to Do Before Typing Code**

Stephanie Thompson

People from all kinds of backgrounds are using SAS® software to meet their business needs. Some come with previous programming experience and some have never typed a line of code in their career. Have you been told what each proc does, that each DATA step must end in a run command, and then been told to write a SAS program? Have you been given code to launch and told to “just change the date and run it every week”? Beware. There is a lot more to SAS programming than knowing some syntax and launching a job. Being a successful SAS programmer means bringing yourself up to speed with some basic programming skills. Before typing even the first line of code into the Enhanced Editor, some preparation needs to be done. Doing this will help you more than you can imagine. This presentation provides the basics of programming that can help you write good code and ensure you are getting the answer you intended to get.

### **Point-and-Click Programming Using SAS® Enterprise Guide®**

Mira Shapiro (co-author: Kirk Paul Lafler)

SAS® Enterprise Guide® empowers programmers, business analysts, statisticians and end-users with the power to perform a multitude of reporting and analytical tasks, access multi-platform enterprise data sources, deliver data and results to a variety of mediums and outlets, perform important data manipulations, and support data management and documentation requirements quickly and easily, without the need to learn complex coding constructs. This presentation shows how to use the graphical user interface (GUI) to access tab-delimited and Excel input files; subset, group, and summarize data; join two or more tables together; flexibly export results to HTML, PDF and Excel; and visually manage projects using flowcharts and diagrams.

### **Quick and Dirty Excel Workbooks Without DDE or ODS**

Andrea Wainwright-Zimmerman

There is a simple trick using the X command in SAS® that allows you to write out your SAS data to an already formatted Excel workbook with graphs and/or pivot tables already built. This presentation will describe how to accomplish this, as well as the limitations of this method.



## SESUG Speaker Sharing Program

### Rules for Tools - The SAS® Utility Primer

Frank Dilorio

Let's start with the premise that good programmers are lazy by nature. They want to use tools such as formats and ODS for execution-time efficiency or to pretty-up our output, functions to perform calculations, and so on. Another hallmark of a good programmer is a keen eye for pattern recognition. Rather than rewrite basically the same program over and over, they identify similarities and parameterize the program, making it into a general-purpose program, a "utility."

This presentation steps through the life cycle of a simple utility. It starts with "naïve" code that doesn't exploit program similarities, then illustrates how a general-purpose utility may be developed. It ends with the initial program becoming a call to a simple, powerful routine in a macro library. The transition from simple, brute-force programming into a compact, general-purpose utility isn't a random event. The last sections of the presentation present a set of design principles for utilities.

Although we focus on Base SAS in Version 9.0, the principles and techniques are readily extended across SAS versions and products. The audience will come away from this presentation with an appreciation of both the process and the tool set required to build generalized programs.

### SAS® Enterprise Guide® 4.3: Finally a Programmer's Tool

Marje Fecht and Rupinder Dhillon

(note – there is also a version of this presentation for Enterprise Guide 4.2)

Have you been programming in SAS for a while and just aren't sure how Enterprise Guide can help you? It isn't *just a pretty face!*

This presentation demonstrates how SAS programmers can use SAS Enterprise Guide 4.3 as their primary interface to SAS while maintaining the flexibility of writing their own customized code.

We explore:

- navigating the views and menus
- using Enterprise Guide to access your existing programs and enhance processing
- exploiting the enhanced development environment including syntax completion and built-in function help
- utilizing Code Analyzer, Report Builder, and Document Builder
- adding Project Parameters and dynamic parameters to generalize the usability of programs and processes
- leveraging built-in capabilities available in SAS Enterprise Guide to further enhance the information you deliver.

Audience: SAS users who understand the basics of SAS programming and want to learn how to use Enterprise Guide. It is also appropriate for users of earlier versions of Enterprise Guide who would like to try out the enhanced features available in Enterprise Guide 4.3.



## SESUG Speaker Sharing Program

### **Talking Past Each Other? How to Communicate with Medical Writers When Preparing Clinical Research Manuscripts for Journal Submission**

Stephanie Thompson

Clinical research manuscripts are often a blend of qualitative prose and quantitative data. And, the people who help the author(s) prepare each section — introduction, methods and materials, results, and discussion — are typically from very different parts of the research organization and have different backgrounds. Speaking a common language makes the process easier. This presentation will present some tips on how to improve communication between medical writers and SAS® programmers, such as biostatisticians. Presented from both points of view, what does and doesn't work will be discussed in a point, counter-point fashion.

### **The SAS® DATA Step: Where Your Input Matters**

Peter Eberhardt

Before the warehouse is stocked, before the stats are computed and the reports run, before all the fun things we do with SAS® can be done, the data need to be read into SAS. A simple statement, INPUT, and its close cousins FILENAME and INFILE, do a lot. This presentation will show you how to define your input file and how to read through it, whether you have a simple flat file or a more complex formatted file.

### **The SAS® Debugging Primer**

Frank Dilorio

Meet an accomplished SAS programmer and you meet someone who's probably learned by making (and fixing) lots of mistakes along the way. The breadth of the SAS System's target applications, the variety of its "dialects" (Base SAS, macro, SCL, IML, SQL), and the quirky procedural/non-procedural environmental mix conspire to make mastery of the SAS System a slippery slope to ascend. Debugging is the art of gracefully recovering and learning from falls during the ascent.

This presentation discusses techniques for debugging SAS programs. Its purpose is two-fold. First, it provides behavioral and technical tips for fixing code (how to read error messages in the SAS Log, knowing when there is a problem with the program even if SAS says there isn't, using the DATA step debugger, identifying system options, using PROCs for data validation, using macro variables to control debugging output, etc.) The second focus of the presentation is its presentation of design and coding methods that make the programming process more reliable, thus reducing the need for debugging in the first place.

The presentation's target audience is relative newcomers to the SAS System. More seasoned users may find or rediscover some of the techniques and features being discussed. Emphasis is placed on Base SAS and the macro language, although the techniques themselves are applicable to SCL and other products.



## SESUG Speaker Sharing Program

### **The SAS® Hash Object: It's Time To .find() Your Way Around**

Peter Eberhardt

“This is the way I have always done it and it works fine for me.”  
Have you heard yourself or others say this when someone suggests a new technique to help solve a problem? Most of us have a set of tricks and techniques from which we draw when starting a new project. Over time we might overlook newer techniques because our old toolkit works just fine. Sometimes we actively avoid new techniques because our initial foray leaves us daunted by the steep learning curve to mastery. For me, the PRX functions and the SAS® hash object fell into this category.

In this presentation, we address possible objections to learning to use the SAS hash object. We start with the fundamentals of the setting up the hash object and work through a variety of practical examples to help you master this powerful technique.

### **Things Dr Johnson Did Not Tell Me: An Introduction to SAS® Dictionary Tables**

Peter Eberhardt

SAS maintains a wealth of information about the active SAS session, including information on libraries, tables, files and system options; this information is contained in the Dictionary Tables. Understanding and using these tables will help you build interactive and dynamic applications. Unfortunately, Dictionary Tables are often considered an ‘Advanced’ topic to SAS programmers. This presentation will help novice and intermediate SAS programmers get started with their mastery of the Dictionary tables.

### **THINK Before You Type... Best Practices Learned the Hard Way**

Marje Fecht

We have all done it....

You leave a meeting with a new project on your plate – you sit down at your computer and start programming – a day later and lots of code on the screen, you try to remember the real purpose of your latest task. Or, worse, you finish your task only to find that it is not what was requested. Discipline and planning aren't always easy but they pay off in the long run!

OR

You deliver the quick adhoc and move onto the next task on the list. A month later, someone wants the “adhoc” again with just a wee variation. WHAT??? You thought you would never look at that code again? Generalization was the last thing on your mind and now you have to dig through all that code... Discipline and planning aren't always easy but they pay off in the long run!

This presentation focuses on best practices to help you minimize effort and maximize results. Although the concepts are more project-focused than SAS®-specific, example SAS code will be shared so that you can apply the concepts more quickly.



## SESUG Speaker Sharing Program

### **While You Were Sleeping.....SAS® Was Hard At Work**

Andrea Wainwright-Zimmerman

Automating and scheduling SAS code to run over night has many advantages, but there are also many pitfalls to be aware of. This presentation discusses how to make sure you save the log, get e-mail messages at critical points, as well as makes other recommendations and considerations on how to make it all work.

### **Why the Bell Tolls 108 times? Stepping Through Time with SAS®**

Peter Eberhardt

For many SAS programmers, new or even advanced, the use of SAS date and datetime variables is often very confusing. This presentation addresses the problems that the most of programmers have. It starts by looking at the basic underlying difference between the data representation and the visual representation of date, datetime and time variables. From there it discusses how to change data representations into visual representations through the use of SAS formats. Since date manipulation is core to many business process, this presentation also discusses date arithmetic first by demonstrating the use of simple arithmetic to increment dates; then by moving on to SAS functions which create, extract and manipulate SAS date and datetime variables. Finally, this presentation demonstrates the use of the %sysfunc macro function and the %let statement to present date, datetime and time variables.

This presentation is introductory and focuses on new SAS programmers, however, some advanced topics are also covered.