



CodeCrafters, Inc.

CodeCrafters, Inc. IS PLEASED TO ANNOUNCE THE AVAILABILITY OF A **NEW WORKSHOP**:

“Building Utilities: Putting Dictionary Tables, SQL, and the Macro Language to Work”

Programmers are always seeking tools to simplify their working lives. They want, for example, normalized data, functions to perform routine tasks, and the ODS to render output in HTML. The same instinct drives them to avoid writing the same type of program more than once. Given an eye for repetition, a little imagination and the right tools, it's possible to create elegant, generalized, reliable utility programs that can decrease program development time and increase product reliability.

Content: This workshop walks you through the “rules and tools” needed to create reusable SAS programs. It is organized into five sections (approximate proportion of total class time is shown in parentheses):

- ✓ **Introductory Example** (5%) With a working definition of a utility in hand, we progress from a simple, brute-force solution to a programming request to a refined, generalized utility. As we make the progression, we identify concepts and tools that will be discussed in later sections.
- ✓ **SQL and the Macro Language** (15%) We address the features of SQL and the macro language that are most relevant to building general-purpose programs.
- ✓ **Dictionary Tables** (30%) We'll see what they are and show why understanding them is a vital skill for developing utilities. For each of the more commonly used tables we discuss content, usage “gotcha's,” and real-world examples.
- ✓ **Best Practices** (35%) This section presents a set of guidelines for building utilities. Because SAS programming is so free-form, it's important to suggest some common structure for programmers' efforts. This is especially relevant for utilities, which by their very nature are shared and highly connected.
- ✓ **Integrating Examples** (15%) The last section examines a series of programs, pointing out the strengths of their construction and giving the students insight into the evolution of the programs' design.

Outcomes: Attendees will come away from the workshop with:

- ✓ **Knowledge** of how to identify the need for and structure of a general-purpose utility.
- ✓ **Understanding** of how to use tools such as dictionary tables, SQL, and the macro language.
- ✓ **Appreciation** of the design strategy required for solid, generalized, and maintainable tools.
- ✓ **Motivation** to build their own utility library and realize the benefits of reliable, reusable code.

Audience: Advanced beginner or more experienced programmers who want exposure to the SAS tools required to develop generalized, reusable programs.

Length and Format: One day (8 hours) lecture.

Prerequisites: Familiarity with basic capabilities of the macro language is *required*. A working knowledge of SQL is *helpful*.

Scope: Examples focus on Windows platforms and Base SAS Version 9.0. The concepts and techniques are applicable to other SAS products and to different operating systems.

Materials: Attendees will receive printed course notes and instructions for accessing the CodeCrafters, Inc. web site for sample programs, macros, and data sets.

Presenter: Frank DiIorio is President of CodeCrafters, Inc. and the author of the books *SAS Applications Programming: A Gentle Introduction* and *Quick Start to Data Analysis with SAS*. A SAS user since 1975, he is a frequent speaker at local, regional and national user groups worldwide, discussing topics such as program design, debugging and efficiency. Frank has been active in the SouthEast SAS Users Group (SESUG) since its inception, and was co-chair of the group's 1994 and 1996 conferences. When not talking or writing *about* SAS, Frank writes *in* SAS, focusing on tool-building for data management and reporting applications in the pharmaceutical industry.

Contact: Direct questions about content, pricing, and availability to Frank DiIorio. Phone: 919-602-8421. Email: training@CodeCraftersInc.com.