SAS Macro Programming

Course ID #: 7000-806-ZZ-Z
Hours: 14

Course Content

Course Description:

In this course, you will focus on using the SAS macro facility to design, write, and debug macro programs, with an emphasis on understanding how programs that contain macro code are processed.

Course Objectives:

- Differentiate between SAS Macro programs and SAS Macro variables
- Perform text substitution in SAS code.
- Use macro variables and macro functions.
- Conditionally or iteratively construct SAS code.
- Write self-modifying, data-driven programs.
- Debug Macro programs

Prerequisites:

Be able to:

- Write a LIBNAME statement
- Write DATA steps using SET, assignment statements, IF/THEN/ELSE, and DO loops.
- Use SAS data set options, including DROP= and KEEP=.
- Use character functions, including SUBSTR, SCAN, and UPCASE.
- Write PROC PRINT, PROC CONTENTS, and PROC FREQ steps
- Write simple SQL queries using the SELECT statement.

Target Audience:

SAS Programmers who are looking to create dynamic, maintenance free programs.

Topics:

Lesson 1: Introduction

- Review common functionality from SAS Programming Essentials course.
- Describe the two components of the SAS Macro Facility.
- List the three tips to making your SAS macro code easier to debug.

Lesson 2: Macro Processing Mechanics

- List the different types of tokens.
- Describe how a SAS program is processed.
- List the macro triggers.
- Describe how a SAS program is processed with macro triggers.

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Lesson 3: Macro Variables

- List the two different types of macro variables.
- Display the automatic macro variables.
- Use an automatic macro variable.
- Create a user-defined macro variable with a %LET statement.
- Use a user-defined macro variable.

Lesson 4: Macro Programs

- Describe the purpose of a macro program.
- Differentiate between compile and execution of a macro program.
- Create a macro definition.
- Call a macro.
- Debug with MPRINT and MLOGIC options.
- Make a macro more dynamic with parameters.

Lesson 5: Macro Symbol Tables / Processing Macro Programs

- Describe where macro variables are stored.
- Differentiate between the Global and Local symbol tables.
- Describe where macro programs are stored.

Lesson 6: Macro Language Functions

- Use macro character functions.
- Use macro evaluation functions.
- Call a SAS supplied autocall macro.
- Mimic a SAS function using %SYSFUNC.

Lesson 7: Macro Expressions and Statements

- Conditionally submit code to the SAS compiler
- Repetitively submit code to the SAS compiler

Lesson 8: Special Characters

- Describe why you would need macro quoting functions.
- Use macro quoting functions.

Lesson 9: Interfaces to the Macro Facility

- Create macro variables from data using CALL SYMPUTX.
- Create macro variables from data using PROC SQL.

Lesson 10: Storing and Reusing Macros

- Store compiled Macro programs in a permanent SAS library.
- Store uncompiled Macro programs and make them always accessible to your program.

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