

Programming II: Data Manipulation Using the Data Step

Course Length: 3 days **CEUs** 1.8

Format: Hands on Training

AUDIENCE

This course is designed for SAS® programmers who need a more indepth understanding of the Data Step. It also provides the tools for programmers to perform various data transformations and summarizations, and read several types of data sources.

BENEFITS

This course focuses on how to manage SAS data, work with different data types, manipulate data, and create various reports. Upon completion of this course, you should be able to:

- Read, create and combine SAS data sets
- Summarize, manipulate and transform data
- Process data iteratively
- Create and use arrays
- Understand how the Data Step processes work
- Create exception reports

PREREQUISITES

Before attending this course, you should have completed the Programming I: SAS Essentials course. Specifically, you should be able to:

- Understand file structures and write system commands to create and access files on your operating system
- Work with a text editor
- Write Data and Proc Steps
- Understand error messages in the SAS log and debug your program
- Work with conditional logic such as and/or/if/then
- Build SAS files from external data
- Use SAS Software to access SAS data libraries
- Program TITLE and FOOTNOTE Statements
- Read a SAS data set with a SET Statement
- Perform a simple merge
- Understand how to drop and keep variables
- Work with SAS date values

COURSE TOPICS

Understanding the Data Step

- Understanding the difference between compile and execute phases of the Data Step
- Learning about Data Step storage areas
- Reading and creating multiple SAS data sets

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How to Debug Your Program

- Learning to Dump the Input Buffer and Program Data Vector with the PUT statement
- Using the interactive debugger to understand program logic Problems

Reading External Data Types and Creating Flat File Basics

- Reading flat files using delimiters
- Reading data from a relational database
- Creating user defined informats for special data
- Creating flat files in SAS

Creating New Variables and Adding Value to Your Data

- Cleaning existing data
- Assigning new character, numeric and date variables
- Using Picture Statements to create user defined formats

Combining Data Files Using a Match Merging and Interleaving

- Match Merging multiple SAS data sets together
- Interleaving SAS data sets with the SET statement
- Changing variable types using the PUT and INPUT functions

Summarizing Data Files

- Summarizing data in the data step using Sum and Retain statements
- Creating group totals with First and Last processing
- Creating summary data sets with Proc Summary
- Selecting specification summarization hierarchies using the `_TYPE_` variable

Perform Iterative Processing on Data

- Using DO loops for repetitive calculations and processing
- Using Arrays to process across an observation
- Using DO WHILE and DO UNTIL statements for conditional looping
- Creating a simple random sample

Producing Exception Reports

- Using a WHERE statement to subset data
- Using a contribution option to perform table lookups when merging files
- Identifying duplicate rows of data in a file