

# Table-Driven Strategies for Rapid SAS Applications Development

*Lecturer: Tanya Kolosova, author of "Object-Based Statistical Programming and Analysis with SAS" published by SAS Institute, 1998 and "Table-Driven Strategies for Rapid SAS Applications Development" published by SAS Institute, 1996*

The goals of this course are:

- To provide a sound understanding of the fundamental concepts of code-free design.
- To demonstrate SAS Software's ability to build complex database applications through table-driven, code-free advanced technology.
- To explain how to construct high-quality, reliable applications that are easy to understand, modify, and maintain.

This course is for application designers, SAS programmers, and application users.

We consider the *application designer* a person who defines application architecture and behavior, and does not need to know the SAS System. The *SAS programmer* should have at least average skills with the SAS System. The *application user* is considered a person who defines application requirements and is ready to participate in the application development process.

*For the application designer:*

- We present an iterative process that will take you from changeable application requirements to working applications, through code-free design.
- We show you how to use the table-driven environment effectively, thereby eliminating the need to know the SAS System at the expert level.
- We explain how to define an application data model using relational technology, specify data manipulation and data analysis processes using the trigger-message mechanism, organize an application using the mode mechanism, and much more.

- We teach you how to cultivate an application to meet future needs.
- We provide you with many realistic examples of application design.

*For the SAS programmer:*

- We show you how to develop table-driven generators to produce application objects and operations using the SAS System language's features.
- We demonstrate how to write reusable code.
- We provide you with many realistic examples of SAS macro and SAS Screen Control Language programs.

*For the application user:*

- We provide you with an understanding of application design and show you how to participate in application development from the very beginning
- We show you how to change or extend data management, analysis, and data presentation.
- We offer you examples and explanations on how to cultivate an application through a table-driven environment.

The complete source codes for the programming examples in this course are available.

**1. Introduction to Code-free Design** introduces the code-free approach to application development and its main principles. This lesson also provides a sample application that will be developed as the book progresses.

**2. The Data Dictionary** explains relational technology and data dictionary concepts. This lesson shows how to use relational technology to define an application data model and how to write programs that support the table-driven environment.

**3. Data Manipulation and Data Analysis** focuses on the concepts and usage of data manipulation and data analysis processes using code-free design. This lesson shows how to use code-free design to define an application operations model specifying data manipulation and data analysis processes, and how to write programs that generate such processes.

**4. Data Integrity Preservation and Verification** focuses on data integrity preservation. This lesson shows how to solve the problem of

data integrity assurance with code-free design and how to write programs that perform data verification processes.

**5. Report Generation** explains the main terms and concepts of reporting technology. This lesson shows how to define reports with the code-free approach and how to write program that generates output reports.

**6. Data Entry Environment** shows how to use code-free design to define a data entry environment and how to write programs that generate working application specific data entry environments.

**7. User Interfaces** focuses on the concepts and usage of menu-driven user interfaces. This lesson shows how to define user interfaces with code-free design and how to write programs that produce menus for the user interfaces.

**8. Data Authorization Access** focuses on the ideas and usage of data authorization access. This lesson shows how to define data authorization access to application objects with code-free design. This lesson also shows how to write programs that perform security and integrity checks on application data.

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# Object-Oriented Statistical Programming and Analysis with SAS

*Lecturer: Tanya Kolosova, author of "Object-Based Statistical Programming and Analysis with SAS" published by SAS Institute, 1998 and "Table-Driven Strategies for Rapid SAS Applications Development" published by SAS Institute, 1996*

The goals of this course are:

- To provide an understanding of concepts of object-oriented statistical programming and analysis.
- To demonstrate SAS software's ability to implement object-oriented approach to statistical programming and analysis.

This course is for statisticians, SAS programmers, and researchers. The complete source codes for the programming examples using in this course are available.

## **1. Introduction to Object-Oriented Statistical Programming**

The student will know principles of object-oriented statistical programming and analysis. The student will be explained the importance of the object-oriented statistical programming paradigm that extends SAS's capabilities. The main goal of this lesson is to create common-level view on object-oriented approach to statistical programming and analysis with SAS.

## **2. Statistical Data Objects and Attributes**

The student will know how to organize data into coherent collections having specific structure and called data objects. The student will learn about attributes characterizing data object, such as mode and length. The student will be explained the basic types of data objects such as vector, matrix, array, list, factor, data table, and time series.

## **3. Statistical Modeling**

The student will know how to create a set of methods that specify how a data object will behave with respect to certain generic operations. The student will be demonstrated reusable SAS macro programs

performing generic statistical functions in SAS. It will be explained how to create methods for developing of statistical models.

#### **4. Data Dictionaries for Classes and Methods Definitions**

The student will learn how to design environment for object-oriented statistical data analysis in SAS. The student will know how to define objects and classes in table-driven environment. The student will learn to consider data as statistical data object, and thus to see all statistical actions that can be performed on this data. The student will be able to define statistical actions specifically for the type of data object and will be able to write reusable SAS macro programs implementing various methods. The student will be demonstrated and explained SAS Macro programs evaluating tables of the table-driven environment in order to determine which method to use for a given data object.

#### **5. Object-Oriented Time Series Analysis**

It will be demonstrated the process of solving of specific statistical problem by using of object-oriented approach to statistical data analysis. The student will know how to define data objects and methods for time series analysis. The student will be demonstrated reusable SAS macro programs performing time series analysis for the variety of types of data objects.

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