

Advanced Statistical Analysis Using IBM SPSS Statistics

Overview

Advanced Statistical Analysis Using IBM SPSS Statistics is a seven day instructor-led classroom course that provides an application-oriented introduction to the advanced statistical methods available in IBM® SPSS® Statistics for data analysts and researchers. You will review a variety of advanced statistical techniques and discuss situations in which each technique would be used, the assumptions made by each method, how to set up the analysis, as well as how to interpret the results. This includes a broad range of techniques for predicting both continuous and categorical outcomes, as well as methods to cluster cases, create statistical groupings of variables, and find similar cases using a large set of variables. You will gain an understanding of when and why to use these various techniques as well as how to apply them with confidence and interpret your output.

Audience

This advanced course is for:

- Anyone who has worked with SPSS Statistics and wants to become better versed in the more advanced statistical capabilities.
- Anyone who has a solid understanding of statistics and wants to expand their knowledge of appropriate statistical procedures and how to set them up using SPSS Statistics.
- Analysts and Modelers

Prerequisites

You should have:

- On the job statistical experience or completion of the Introduction to Statistical Analysis Using IBM SPSS Statistics course and/or Intermediate-level statistics oriented courses.
- Knowledge of basic statistics, including linear regression.
- IBM SPSS Statistics Standard, IBM SPSS Statistics Professional, IBM SPSS Statistics Premium.

Course Outline

Factor Analysis

- Explain the basic theory of factor analysis and the steps in factor analysis
- Explain the assumptions and requirements of factor analysis
- Specify a factor analysis and interpret the output

K-Means Cluster Analysis

- Explain the basic theory of cluster analysis and the steps in doing a cluster analysis
- Explain the approach of K-Means cluster analysis

- Specify a K-Means cluster analysis and interpret the output

TwoStep Cluster Analysis

- Explain the basic approach of TwoStep cluster analysis
- Specify a TwoStep cluster analysis
- Use the Model Viewer to study and interpret the output

Binary Logistic Regression

- Explain the basic theory and assumptions of logistic regression
- Specify a logistic regression analysis
- Interpret model fit, logistic regression coefficients and model accuracy

Multinomial Logistic Regression

- Explain the basic theory of multinomial logistic regression
- Specify a multinomial logistic regression analysis
- Interpret model fit, logistic regression coefficients and model accuracy

Discriminant Analysis

- Explain the basic theory of discriminant analysis and how cases are classified
- Specify a two-group discriminant analysis and interpret the resulting output
- Complete additional analysis and validation of the discriminant model

Nearest Neighbor Analysis

- Explain the basic approach of nearest neighbor analysis
- Explain the meaning of k in the analysis and how cases are classified
- Specify a nearest neighbor analysis and interpret the resulting output in the Model Viewer

Kaplan-Meier Analysis

- Explain the general principles of survival analysis
- Specify a Kaplan-Meier analysis and interpret the resulting tabular and graphical output
- Specify a Kaplan-Meier analysis with a strata variable, and with pairwise comparisons

Cox Regression

- Explain the general principles of Cox regression
- Specify a Cox regression analysis and interpret the resulting tabular and graphical output
- Test the assumption of proportional hazards
- Specify a Cox regression with time-varying covariate for variables that don't meet the assumption of proportionality

Generalized Linear Models

- Explain the use of the exponential family of distributions and a link function and how these differ from a generalized linear model from a general linear model
- Specify a Generalized Linear Model analysis and interpret the resulting output
- Check model assumptions and predictions

Linear Mixed Models

- Explain the general principles of a linear mixed model approach to data analysis
- Specify a Linear Mixed Model analysis and interpret the resulting output, building successive models of greater complexity

Time Series Analysis and Forecasting with IBM SPSS

- The basics of forecasting
- Smoothing time series data
- Outliers and error in time series data
- Automatic forecasting with the Expert Modeler
- Assessing model performance
- Fitting curves to time series data
- Regression with time series data
- Exponential smoothing models
- ARIMA models
- Applying a model to new data
- Seasonal decomposition
- Modeling seasonality
- Intervention analysis
- Transfer functions in ARIMA
- Automatic forecasting of several time series