SIERRA INFORMATION SERVICES

...Maximizing your investment in the SAS® System... and those in your organization who use it...

An intensive look at SAS/STAT® and BASE SAS tools used to implement and analyze the results of studies predicting the value of a continuous level dependent variable. The focus is on practical implementation of techniques and interpretation of the SAS-generated output.

After taking this seminar you will be able to:

- **Apply SAS tools to assess the presence of a linear relationship between two continuous-level variables**
- **Implement a simple linear regression analysis using PROC REG**
- **Interpret the output generated by PROC REG**
- **Test for the presence of influential observations in your data set**
- **Create SAS data sets from PROC REG, and use them to assess your model**
- **Implement and interpret the results of a multiple linear regression model**
- **Apply 'optimal subset selection' techniques to find a potential 'best' model**
- **Use PROC GLM to implement an Analysis of Covariance (ANCOVA) model and interpret the results**
- **Successfully attend our "Building and Applying Predictive Models" one-day seminar**

One Day Seminar from Sierra Information Services

Linear Regression Modeling with the SAS® System

Overview

This one-day course gives attendees an intensive introduction to building and applying linear regression models using SAS System tools. You will learn how to use PROC REG, as well as other Base and SAS/STAT Procedures, to build, interpret and apply statistical models with a continuous dependent and one or more independent variables. This session also serves as an effective refresher/lead-in to our Building and Applying Predictive Models Using the SAS System seminar. This course also shows you the key enhancements to the REG Procedure contained in Version 8 and SAS 9 Software, and how to use Output Delivery System (ODS) capabilities to facilitate both the development of your models and their explanation/interpretation by others.

Intended Audience

Those who want to learn how create linear regression models and how to interpret the results of the models they build. This course is appropriate for researchers, programmers, analysts, technologists and other SAS Software users in scientific, corporate, and governmental settings *who meet the prerequisites given below*. You should be familiar with key SAS System concepts such as data set, SAS procedure, observation, variable, label and format. The materials presented in this course also assume you are familiar with statistical concepts such as independent and dependent variable, slope, intercept, confidence interval, null and alternative hypothesis, and p-value. The **emphasis of this class** is on the **generation and interpretation of statistical models** using SAS Software, and **not** on data management/ programming.

Seminar Topics:

Assessing linear association between variables

- Creating and interpreting the results of a simple linear regression model using PROC REG
- Understanding and interpreting parameter estimates and "coefficient of determination"

Creating output SAS data sets using PROC REG, and then using the variables in those data sets to assess the model

- How do we know when we have a "good" linear regression model? How and where does SAS give us "hints" that there are problems with our data?
- Model misspecification
- Outliners and Influential Observations

Creating and interpreting multiple regression models

- Automated selection of "optimal subsets" of independent variables in multiple regression
- When do we have "enough" versus "too many" independent variables in our model?
- Understanding and diagnosing multicollinearity among independent variables
- Principal components regression as a "treatment" for multicollinear independent variables (briefly)

Avoiding the "lurking qualitative variable" using Analysis of Covariance (ANCOVA) models in PROC REG

- Using the Output Delivery System (ODS) in conjunction with PROC REG to
- Create visually appealing presentations of the SAS-generated output
- Create output data sets containing the statistics generated by analytic PROCs such as PROC REG, CORR and UNIVARIATE
- Easily generate comparisons of the results of several competing regression models
- Use the experimental ODS statistical graphics tools available in PROCs REG and CORR in SAS 9.1 Software

Contact Sierra Information Services For More Information:

Email: training@sierrainformation.com **Phone:** (707) 996 7380

www.SierraInformation.com

About the Instructor

This seminar is written and presented by Andrew Karp, who started his own SAS Software consulting and training firm, Sierra Information Services, in 1994. Prior to starting Sierra he used SAS Software extensively to manage and analyze data while holding positions with PriceWaterhouseCoopers, Federal Express Corporation, Pacific Gas & Electric Company and Kaiser Foundation Health Plan. A 24-year SAS user, Andrew is a SAS Certified Professional™ who has presented this, and other, training seminars to SAS users in the United States, England, Scotland, Belgium, Australia, New Zealand and the People's Republic of China.

He has served on the technical review teams for seven books published by SAS Institute and has been an invited speaker at twelve consecutive SAS Global Forum/SAS User Group International conferences, as well as other events for SAS users in seven countries. Andrew earned undergraduate and graduate degrees from The George Washington University and taught for UC Berkeley's Extension Division from 1989 to 1995. He has also been a visiting lecturer in the Dept. of Experimental Statistics at Louisiana State University and at the University of Auckland in New Zealand.

About Sierra Information Services

Sierra Information Services is a **leading independent provider of SAS Software** consulting and training services. Our firm is based in the California Wine Country region north of San Francisco but **travel both domestically and internationally to work with clients and present training seminars**. Sierra offers clients **a wide range of support**, including SAS programming, data analysis/data mining with SAS tools, as well as the design and delivery of customized SAS Software training solutions tailored to the client's individual needs. Since its inception in 1994 Sierra has provided consulting and/or training services to, among others, Wells Fargo Bank, Bear Creek Corporation, Limited Brands, IBM, American Honda Motor Company, Lloyd's Bank/TSB, Capitol One Financial Services, Inc., Discover Financial Services, Inc., the US Department of Commerce and the US Federal Communications Commission. We have also provided consulting and training for numerous public and private sector entities in the United Kingdom, Belgium, Australia and New Zealand.

In addition to training solutions developed by Sierra's founder, Andrew Karp (see instructor's bio above), Sierra also works with other leading SAS experts to offer their training seminars around the United States. Sierra is proud to have well-known experts such as Art Carpenter, Dr. Paul Allison, Michael Raithel, and David Cassell present their training seminars under our auspices.

For the most current list of our public seminars, or to learn more about how Sierra can assist you and your organization, please visit our web site at www.**SierraInformation**.com or call us a (707) 360 5383. We look forward to hearing from you soon!

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Sierra Information Services

19229 Sonoma Highway
Sonoma, CA 95476

Voice: (707) 996 7380
Fax: (800) 248 8958
Email: training@sierrainformation.com

Visit Sierra on the Web at
www.SierraInformation.com