

**I. TITLE OF HALF DAY
WORKSHOP**

**Exploratory graphical data analysis in model building
and prediction**

**II Instructor's contact
info**

George Fernandez PhD
Professor of Applied Statistics
University of Nevada - Reno
Reno NV 89557
(775) 784-4206
E-mail: gcjf@unr.edu
Homepage: <http://www.ag.unr.edu/gf>
Resume : <http://www.cabnr.unr.edu/gf/GFResumetop.htm>
Presentations: <http://www.cabnr.unr.edu/gf/dmpresent.html>

III. Instructor's Bio:

Prof George C.J. Fernandez currently serves as the statistician for the Nevada Experimental station and Cooperative Extension. He has more than 20 years of experience in teaching courses such as introductory statistical methods, design and analysis of experiments, linear and non-linear regression, multivariate statistical methods and SAS programming. He is a professional SAS programmer and has over 22 years experience in many statistical and graphical SAS modules. He has won best paper and poster presentation awards at the regional and international conferences. He has presented several invited full-day workshops on "Applications of user-friendly statistical methods in Data mining: American Statistical Association Joint meeting in Atlanta (2001), Western SAS users Conference in Arizona (2000), in San Diego (2002), and San Jose (2005), 56th Deming's conference, Atlantic City (2003), Key-note Speaker and workshop presenter, 16th Conference on Applied Statistics, Kansas State University. Many international and national SAS users are currently using his user-friendly SAS applications for data analysis via on-line. He has also organized 7th Western Users of SAS conference (WUSS) at Los Angeles in 1999 and served as the section chair, SUGI31. His book on "Data mining using SAS applications" (CRC press / Chapman Hall) contains many user-friendly SAS macro-applications.

IV Course Abstract

Data exploration and graphical data analysis methods stress visualization to thoroughly study the structure of data and to check the validity of statistical model fit to the data. This half-day course covers fundamental concepts for understanding and successfully applying data exploration and graphical data analysis methods by using the powerful **user-friendly SAS macro applications**. These concepts will be illustrated via downloadable SAS macro files. The participants will learn data exploration, best model selection, model fitting, model validation and graphical data analysis methods used in multiple and logistic regression. This workshop is intended for data analysts, predictive modelers, statistical consultants, and bio-statisticians, in advanced training in data exploration and graphical data analysis methods for increasing the effectiveness, efficiency, and productivity of research and development. Participants are required to have an understanding in basic statistical methods and an introductory working knowledge in SAS systems

V. Course Outline

1) Data exploration and graphical data analysis methods used in multiple linear regression

Multiple regression model: Partial regression plots, VIF plots, model selection methods based on AICC and SBC, model prediction, regression diagnostic checks, model validation methods

SAS DEMO:

Demonstrating the features of **Regdiag** macro for fitting multiple linear regression modeling, checking partial regression plots, model selection methods, model prediction, regression diagnostic checks, model validation methods

2) Data exploration and graphical data analysis methods used in Binary logistic regression

Logistic regression model: partial delta logit plots, model selection methods, model prediction statistics, logistic regression diagnostic checks, model validation methods, ROC curve, Classification table, Hosmer and Lemeshaw goodness-of-fit statistics.

SAS DEMO:

Demonstrating the features of **Logistic** macro for generating predictive probability plots, comparing model selection methods, model prediction statistics, logistic regression diagnostic checks, model validation methods, ROC curve, Classification table, and Hosmer and Lemeshaw goodness-of-fit statistics.

VI .LEARNING OUTCOMES	Upon completion of this workshop the participants will have a broad base of knowledge and access to these user-friendly SAS macro tools to perform appropriate graphical methods in data exploration, model building, prediction and in classification and check for data and model specification errors using SAS software.
VII Instructional Methods	<p>The course topics listed in the outline section will be presented following the same sequence using a power-point presentation slide show format. The participants will be encouraged to actively participate during the presentations by sharing their experiences in statistical data analysis projects.</p> <p>SAS DEMO:</p> <p>As an alternative to the point-and-click menu interface modules for obtaining quick and complete results from statistical analysis, a user-friendly based SAS macro applications will be presented here. This macro approach integrates the statistical and graphical analysis tools available in SAS systems and provides complete data analysis tasks quickly without writing SAS program statements or using the point and click menu interface by running the SAS macros in the background. The main feature of this approach is that participants can perform graphical statistical analysis quickly by following the steps and using the downloadable SAS macros. Using this MACRO APPROACH, the participants can effectively and quickly perform data analyses and spend more time exploring data, and interpreting graphs and output, rather than debugging their program errors etc.</p> <p>With the help of computer VGA projection systems, SAS demos will be performed using my notebook computer and the participants will have a chance to see and learn how these user-friendly SAS macros are used to perform data exploration and graphical data analysis methods.</p>
VIII Course materials and software	<p>Course materials: Hard copy of full set of power-point lecture notes</p> <p>Software: Unlimited access to use of the Online SAS macro applications (REGDIAG, and LOGISTIC) covered in this workshop.</p>