**Psy 633 Lab Assignment 5: Multiple Regression**

We will be using the Test scores, GPA, and Stats Performance data file which is posted on the course website. The output is not required for this assignment, but you may want to save it for your files.

1.  Run the bivariate scatterplots to ensure linearity between each independent variable and the dependent variable. What do you conclude? Are there any blatant violations of the linearity assumption?

2.  Run the standard multiple regression analysis (the full model with all five variables entered into the model simultaneously).  ANALYZE, REGRESSION, LINEAR...Be sure to request descriptives and collinearity diagnostics along with the default selections.

What do you conclude about this full model? Does it explain a significant proportion of variability in stats exam scores?

3.  Now suppose that you wonder whether all five predictor variables are necessary in predicting stats exam scores. After all, five is a large number of predictor variables and all variables require time and money to obtain. You notice the predictors may be grouped into two different sets—high school aptitude test scores and high school GPAs. You hypothesize that perhaps English and Math aptitude scores predict a significant amount of variability in stats exam scores without having to include the other three GPA measures. Reset if necessary. Run a regression analysis that compares two hierarchical models against each other--The "reduced" model using English and Math aptitude scores vs. the "full" model using English aptitude, Math aptitude, and the three high school GPAs. Be sure to request descriptives, collinearity diagnostics, and R Squared Change along with the default selections.

4.  Evaluate the tolerance statistics.  Is multicollinearity a problem?

5.  What percentage of variability in stats exam scores is explained by the reduced aptitude tests only model?

6.  For the aptitude tests only model, how much distance do we expect, on average, between predicted stats exam scores and actual stats exam scores?

7.  What is the total percentage of variability in stats exam scores explained by the "full" model using all five independent variables?

8.  What percentage of additional variability in stats exam scores is explained when the three GPA measures are included in the model (above and beyond the variability explained by model 1-math and English aptitude scores)?

9.  Is the “full” model significant in predicting stats exam scores? Explain.

11.  Is the reduced aptitude scores only model significant in predicting stats exam scores? Explain.

12.  Recognizing the limited time and resources usually available to researchers/stats instructors, which of these two models would you use to make predictions about stats exam scores? Explain.

13.  Write the regression equation for stats exam scores.