**Research Question:**

The material in this class slowly gets harder as the semester continues (or the students get sick of the class). Run an ANOVA to determine if there are differences in quiz grade averages across the semester or if all the averages are the same. Run THREE post hoc pairwise comparisons to determine which quiz might have the lowest score.

**IV:** Different quizzes with different course materials

**DV:** Quiz scores – each quiz grade is listed. Quizzes were given every two weeks over material. Scores ranged from 0 to 75, but since extra credit was allowed, some scores may go up to 80 points.

Include the following SPSS boxes:

1. Data screening:
   1. Accuracy – show the data is accurate with a descriptives box.
      1. If the data is inaccurate, delete the scores.
   2. Missing data – show if there are any missing data with a descriptives box.
      1. If so, delete the missing data.
   3. Outliers
      1. What are the top five Malanobis scores?
      2. What is the cut off score for Mahalanobis (df and X2)?
      3. Delete any multivariate outliers.
   4. Multicollinearity – are any of the time measurement too correlated?
      1. Include the correlation table.
   5. Normality
      1. Include output that shows skew and kurtosis values for the DV.
      2. Are the skew/kurtosis values within the normal range?
      3. Include the multivariate normality chart.
      4. Is the data normal?
   6. Linearity
      1. Include the PP plot.
      2. Is the data linear?
   7. Homogeneity
      1. Include the residuals graph.
      2. Is the data homogeneic?
2. ANOVA
   1. Include the descriptives box.
   2. Include the sphericity test.
   3. Include the ANOVA box.
      1. Was the test significant?
      2. Write the omnibus *F* value in APA style.
   4. Include your post hoc comparison (correction) box.
   5. Calculate Cohen’s d for your post hoc tests.
3. Chart
   1. Make a graph of the means of each quiz time.
   2. Be sure to have:
      1. Error bars
      2. X axis labels
      3. X axis group labels
      4. Y axis labels
      5. Y axis length
4. Write up:
   1. Short description of the study and variables.
   2. Data screening and assumptions – be sure to include a short description of the following.
      1. Missing data
      2. Outliers
      3. Multicollinearity
      4. Normality
      5. Linearity
      6. Homogeneity
      7. Sphericity
   3. Descriptive statistics: you can use the graph created and reference that figure (aka See figure 1 for means and confidence intervals).
   4. Inferential statistics
      1. The *F*-test result
      2. The post hoc results
      3. Effect sizes
   5. A short description of what the results practically mean (which quiz is the best? Based on the results, what would you recommend?).