NFL team data was compiled on the number of passes attempted by quarterbacks for each team to determine if each quarterback (first and second string) was able to attempt different numbers of passes in each of three weeks.

SPSS dataset:

* Week number – three consecutive weeks within one season (w1, w2, w3)
* Quarterback – first and second string quarterbacks for each time (qb1, qb2)

1. How would you describe this ANOVA?
   1. #x# =
   2. Type of research design =
2. Data screening (assume you’ve screening for missing and accuracy errors):
   1. Outliers
      1. What are the top 5 Mahalanobis scores? (you can list them, rather than output).
      2. What are the *df* for your Mahalanobis cutoff?
      3. What is the cut off score for your Mahalanobis measure?
      4. How many outliers did you have?
   2. Multicollinearity: Include a bivariate correlation table of your continuous measures.
      1. Do you have issues with multicollinearity or singularity (remember this rule is different for RM designs)?
   3. Normality:
      1. Multivariate: Include a SPSS box that shows how you might assess multivariate normality.
      2. Do you think you’ve met the assumption for normality?
   4. Linearity:
      1. Multivariate: Include a SPSS box that shows how you might assess multivariate linearity.
         1. Do you think you’ve met the assumption for linearity?
   5. Homogeneity/Homoscedasticity:
      1. Multivariate: Include a SPSS box that shows how you might assess multivariate homogeneity/homoscedasticity.
         1. Do you think you’ve met the assumption for homogeneity/homoscedasticity?
3. Run a two-way analysis.
   1. Include the Sphericity test.
      1. Do we meet the assumption?
   2. Include the omnibus ANOVA test box.
      1. Which effects are significant?
   3. Include the marginal means estimates.
   4. Include a box of the interaction means.
   5. Include at least one plot.
4. Simple effects analysis:
   1. What type of test statistic would you use?
   2. What post hoc correction would you use?
      1. What would your corrected value be (show your work)?
   3. List the pairs you would compare (should match your output).
   4. Include the t-test boxes for your comparisons.
5. Include a figure of the interaction (remember: x-axis, y-axis, error bars).
6. Include a write up of the results of your study. Things to include:
   1. Brief description of the variables.
   2. Type of analysis used (i.e. ANOVA).
   3. Test statistics for both main effects and interaction.
   4. Test statistics for post hoc tests.
   5. List which type of error correction you used.
   6. A reference to your figure.
   7. Effect sizes for all statistics.
   8. Two decimal places for statistics.

Theory questions:

1. Why are repeated measures designs more powerful?
2. What are the two parts to the sphericity assumption?
3. If you decide to correct for sphericity, which correction should you pick?
4. How are the partial degrees of freedom calculated?