Below are the things I would expect you to know for the exam on Wednesday, May 9 from 4 to 6:45 PM.

Know the things from the mid-term test that included principal component analysis and factor analysis plus these expectations:

I expect you to be able to use a set of data on two or three variables with 10 or fewer observations (frequently I use digits from your VCU V-number as one of the values in the data set) to be able to do the following:

* Center or mean correct the data and standardize the data.
* Calculate the centroid (mean vector), the covariance matrix, and the correlation matrix.
* For a covariance or correlation matrix, calculate the total variance, generalized variance (determinant), eigenvalues and the corresponding eigenvectors.
* For a vector be able to calculate the length of the vector and use the vector to translate a set of data into a new variable (calculate scores for principal components).

Since the mid-term, I have covered the topics below along with some designated expectations.

* Cluster analysis (both hierarchical and k-means)
* One-factor MANOVA and subsequent analysis of significant individual variables using ANOVA and multiple range tests (Tukey HSD in JMP and Tukey Post Hoc test in SPSS)
* Discriminant Analysis in both JMP & SPSS. Know how to select and indicate the prior probabilities of (all groups having the same likelihood, the data being a representative sample of the phenomenon being modeled, or entering specified prior probabilities for each group). Also interpret the results of the leave-one-out classification procedure in SPSS.
* For Discriminant Analysis with two groups you should be able calculate the prior probabilities to enter to compensate for unequal misclassification costs for a situation that has specified prior probabilities and either the costs for the two types of misclassification or the ratio between the two.
* Be able to use the Fisher’s linear discriminant functions and variable values for an unknown case to predict the group for the unknown case.
* Bivariate Logistic Regression in both JMP & SPSS.
* Be able to use the Bivariate Logistic Regression coefficients and variable values for an unknown case to estimate the probability of this unknown case being an Event and predict the group for the unknown case.

I expect you to answer general questions and questions based on output from either JMP or SPSS for Principal Component Analysis, Factor Analysis, Cluster Analysis, MANOVA, ANOVA, Multiple Range Tests, Discriminant Analysis, Bivariate Logistic Regression and the use of Training and Validation Data in the model building process.

Suggested JMP resources: You can download books and save the pdf file from JMP by going to Help > Books > (select the appropriate book)

***Multivariate Methods***

Chapter 3 (Correlations and Multivariate Techniques)

Chapter 4 (Cluster Analysis)

Chapter 5 (Principal Components).

Chapter 5 (Discriminant Analysis)

***Consumer Research***

Chapter 6 (Factor Analysis) from this Consumer Research book. We **will not use** the **Maximum Likelihood** method of extracting factors **nor** the **Common Factor Analysis** method for estimating the variance for the common factors for each variable.

***Fitting Linear Models***

Chapter 10 (Logistic Regression with Nominal or Ordinal Responses) We only covered Nominal Responses with two Nominal Categories.