Exam 2 Study Guide

## Topics To Know For The Exam

* how can bias affect modeling
* what an outlier is
* what is an influential outlier and when should we consider them
* what assumptions do
* main assumptions
* how to assess
  + linearity
  + normality
  + homoscedasticity
  + independence of residuals
* know if your data needs to be normally distributed
  + what should be normally distributed
* how the central limit theorem involved in modeling
* know what and how homoscedasticity affects models
* know what homoscedasticity and heteroscedasticity are
  + what are options if you have heteroscedasticity
* what independence is
* know the difference between a p-p plot and a q-q plot
* what are the problems with statistical tests for testing normality assumption
* how to spot issues with normality and independence
  + how should visuals look for these assumptions
* know how to write out statistics in text form
* what can be done with bias in your data
* how to deal with violated assumptions
* know the difference between independent-samples t-test and paired-samples t-test
* know how t-tests are included in the linear model
* know what a dummy variable
  + know what the values are for dummy variables
* know what the intercept in a linear model is (t-test only)
* know what a Welch t-test and how its different from a Student’s t-test
* know the interpretation of a t-test
  + what does it mean to have a significant finding
* what is the issue of running multiple t-tests
  + what will happen if we run 20 tests and find one statistical finding
* know why we remove population means from calculations
* know how to calculate independent-samples t-test, paired-samples t-test, and one-way ANOVA
* know what the variance sum law is
* know what is missing from equations/formulas
* know what formulas/equations mean
* know what needs to be done when groups are different for independent-samples t-tests
* know the designs of each test (between-subjects, within-subjects)
* know the difference in the formulas for a paired-samples t-test
* know the difference in the distributions between the t-test distributions
* know the standard error of differences
* know how to calculate effect sizes for all tests
  + know size of correlation effect sizes
* difference between ANOVA and independent-samples t-test
* know how to read all the tables (studentized, t, F)
* know what a reference group
* know what an ANOVA can’t do compared to a linear regression
* know how to formulate both a null hypothesis and an alternative hypothesis
* know, generally, the difference between a planned contrast and a post-hoc analysis
* know what a F-test tells us and what it doesn’t tell us
* know when to check post-hoc findings
* know what a grand mean is compared to group means
* know what the total, model, and residual sum of squares
* know the difference between sum of squares and mean squares
* know what each degrees of freedom are and what they are used for
* know what a F-test is compared to the specific comparisons
* know how to calculate a Tukey Honestly Significant Difference Test
* know how to tell if a finding is statistically significant
* know what can be done to data suffering heterogeneity/heteroscedasticity for a F-test
* what can be done to correct model parameters that may violate assumptions for F-tests
* know, generally, what orthogonal vs non-orthogonal contrasts are
* know how many curves in a line equal what trend is trying to be shown
* know what happens when there are too many curves in a trend line
* know when to use the Least-Significant Difference comparison
* know what post-hoc tests are the most balanced
* know the difference between and