STA-209 Exam 3 Topics

The **vast** majority of exam 3 content will be focused on linear regression and ANOVA. This list is not exhaustive, but will serve as a good guide. There will be a small bit of study design content that has been with us for awhile.

General
- parameter vs statistic
- defining parameters and statistics in context of a study
- describing aspects of a study
    - experiment vs observational
    - population/sample/case/explanatory/response var

Study Design
- randomization vs random sampling
- generalization vs causal conclusions

Linear Regression
- correlation (pearson / spearman)
- scatterplot description, judging forms of relationships
- ecological correlation (and fallacy)
- writing regression equations using R output
- interpreting slopes and intercepts (using both categorical and quantitative)
- prediction using the regression equation
- residual calculation
- R^2, adj. R^2 interpretations, using them to guide model selection, assess performance
- overall model fit using F-stat and p-value (know hypothesis statements!)
- individual slope/intercept tests using t-stat and p-value from ANOVA table
- residual analysis and checking conditions/assumptions

ANOVA
- intuitive descriptions of SSG, SSE, SST, MSE, MSG, F
- what these terms represent in terms of variability in a graph
- Null and alternative hypothesis
- type-1 or type-2 errors in context of an ANOVA setup
- Filling out an ANOVA table using info (example will be given in practice review)
- Research question conclusions in context using p-value
- residual analysis and checking conditions/assumptions