Applied Stats I
Exam Two Review

Disclaimer: The following questions are meant to serve as preparation, and are examples of what may appear on the second exam. Notice that much of the content on the second exam, as in class, is cumulative from the previous exam. Do not rely on this content as your sole means of preparation, this is meant to guide your studying.

1 Terms

Be able to define these terms and describe why they're important:

- Describing data:
  - Parameter vs. statistic
  - Data
  - Observations
  - Population
  - Sample
  - Variable
  - Skew
  - Outliers
- Measures of Central Tendency and Dispersion:
  - Mean
  - Median
  - Variance
  - Standard deviation
- Distributions
  - Normal Distribution
  - T Distribution
  - Degrees of Freedom
  - Standard deviation/variance
  - Sampling distribution
  - Central Limit Theorem
  - Standard error
- Estimation
  - Point estimate
  - Confidence interval
  - Confidence level
  - Bias
  - Efficiency

- Hypothesis testing
  - Hypothesis
  - Null/alternative hypotheses
  - Test statistic
  - P-value
  - Significance level (α-level)
  - Type I & Type II error
- Regression
  - Linear regression
  - Regression analysis
  - Y-intercept
  - Slope
  - Least squares line
  - Sum of squared error
  - Residual sum of squares
  - Total sum of squares
  - Correlation coefficient (r/R)

2 Calculate/execute these concepts:

- Measures of central tendency:
  - Mean
  - Median
- Measures of dispersion:
  - Variance
  - Standard deviation
  - Standard error
- Confidence intervals:
  - Confidence interval for a mean (large sample)
- One-Sample Hypothesis Testing:
  - Hypothesis testing for a mean (large sample)
  - Hypothesis testing for a mean (small sample)
- Regression
  - Interpret y-intercept and slope for a linear function
  - Write a prediction equation
  - Calculate Sum of Squared Errors
  - Calculate Total Sum of Squares
  - Interpret a scatter plot
  - Construct a CI around β
  - Conduct a hypothesis test for β
  - Calculate standard error for β
  - Calculate S_x and S_y

- Calculate r and interpret its meaning
- Calculate r^2/R^2
- Interpret a regression analysis table
- Interpret regression coefficients
- Interpret the significance of a multiple regression using the F-distribution
- Test an interaction term
- Interpret a regression line with an interaction term
- Plot regression lines
- Interpret error terms in regression equations
- Interpret residuals plotted together
- Transform variables