POL 212
Winter 2024
Midterm Study Guide

1.) Basic data visualization/descriptions

   a. Load datasets
   b. Correlations between variables
   c. Histograms of variables
   d. Scatterplots of variables with nonparametric (lowess) smoothers
   e. Levels of measurement and corresponding R implementations (e.g., nominal/categorical and the "factor" class)

2.) Estimate a bivariate regression ($y \sim x_1$) and a multiple regression ($y \sim x_1 + x_2 + \ldots + x_p$) and for each:

   a. Interpret alpha (intercept) coefficients
   b. Interpret beta (weight) coefficients
   c. Apply a nonlinear transformation (e.g., log) at least one of the independent variables and interpret its coefficient
   d. Create and include an index variable (either as a dependent or independent variable) and interpret the results
   e. Apply and interpret standardized versions of the coefficients
   f. Interpret the statistical significance of the coefficients (p-values)
   g. Interpret model fit (R^2 values)
   h. Simulate one or more noise variables and include in model; interpret results
   i. Bootstrap a statistic of interest (e.g., a regression coefficient or the model R^2) and present results