Intro to Math for Political Scientists

Homework 6

Fall 2017

1. You are interested in whether people are Democrats or not. You take a random sample of 100 US citizens and find that 56 are Democrats:
    1. What's the mean and median of your sample?
    2. What's the variance of your sample?
    3. Define a variable Y representing the distribution of whether or not a person is a Democrat. Estimate all applicable parameter(s).
2. Using a dataset in R (`mtcars`, `mpg`, or `gapminder`, if you don't have one already in mind), calculate an ols model with one independent variable and one dependent variable.
    1. Explain the meaning of the intercept and the number associated with the variable you've chosen.
    2. For an interesting x value, calculate your predicted y value.
3. Consider the following output from a regression with income (if 10s of thousands of dollars) as the dependent variable. Prestige represents the prestigiousness of a school, methodologist is an indicator variable for whether or not the person is a methdologist, and P*M is their interaction.

Variable	Coefficient
Prestige	10.5
Methdologist	0.3
P*M	1.4
Intercept	30

    1. Explain the substantive interpretation of all four parameter estimates.

Calculate:

    2. The predicted income of a non-methodologist with a prestige score of 3
    3. The predicted income of a methodologist with a prestige score of 2.5