Problem Set 4

Your name

This week we will be working with Wooldridge's dataset (`VOTE1.dta`).

Quadratic regression (4 points)

1. Imagine that you are a campaign adviser to an incumbent candidate. In the course of your work, you come across a theory that there are diminishing marginal returns to campaign expenditures for incumbents. Using only two variables *VoteA* and *expendA*, test this theory in a regression. (1 point)
2. Interpret the regression results. (1 point)
3. Draw a scatter plot and fitted curve, which depict the relationship expressed in question 1. (1 point)
4. If diminishing marginal returns exist, at what point do we begin to see a negative relationship between spending and the incumbent's vote share? (1 point)

Calculate standard errors + Level-log regression (3 points)

5. Regress *voteA* on *lexpendA* and interpret the regression results. (1 point)
6. Following the instruction in lab 4, calculate the standard error of the coefficient on *lexpendA* and the corresponding t-statistic, p-value, and 95-percent confidence interval. Compare these results with the output of the built-in function `lm()`. (2 points)

Heteroskedasticity and Outliers (3 points)

7. Regress *voteA* on *expendA* and interpret the regression results. Using `plot()` to run diagnostics. Explain your findings of each plot. (2points)

Then, answer the following questions: Do you conclude that there is heteroskedasticity in this regression? (1 point)