**Week 9: Ordinary Least Squares**

Complete these problems from Chapter 7 in Open Intro Statistics: 7.4; 7.8; 7.14; 7.22; 7.24; 7.32; 7.42; 7.44

1. Answer the following statements with True or False

1. If I remove a variable from the model, and the other parameters don’t change, then the relationships I’m capturing are linear.
2. You can use linear regression to model a variable that is repeated measurements of the same individual over time
3. Income as predicted by age is an example of a relationship that exhibits homoscedasticity, or constant variance
4. A correlation of -1 means that there is no relationship between two variables
5. Linear regression can only model additive relationships
6. It is fine if there is a pattern in the residuals as long as the variance among the residuals is constant

2. You are a political consultant hired to conduct an analysis into your candidate’s favorability ratings. You plan to model this with a linear regression. Your outcome is candidate approval rating, and your independent variables are age, income, and political ideology. To get your data, you survey respondents in swing districts that you predict will be close in the next election. Is your selection of a linear model justified? Describe why or why not.

3. You are running linear regression with income as the response and education as the explanatory variable.

1. Set-up and describe the null hypothesis in this situation.
2. Say you get a p-value of .04. How would you interpret this?