WU #7 - Correlation of coefficients
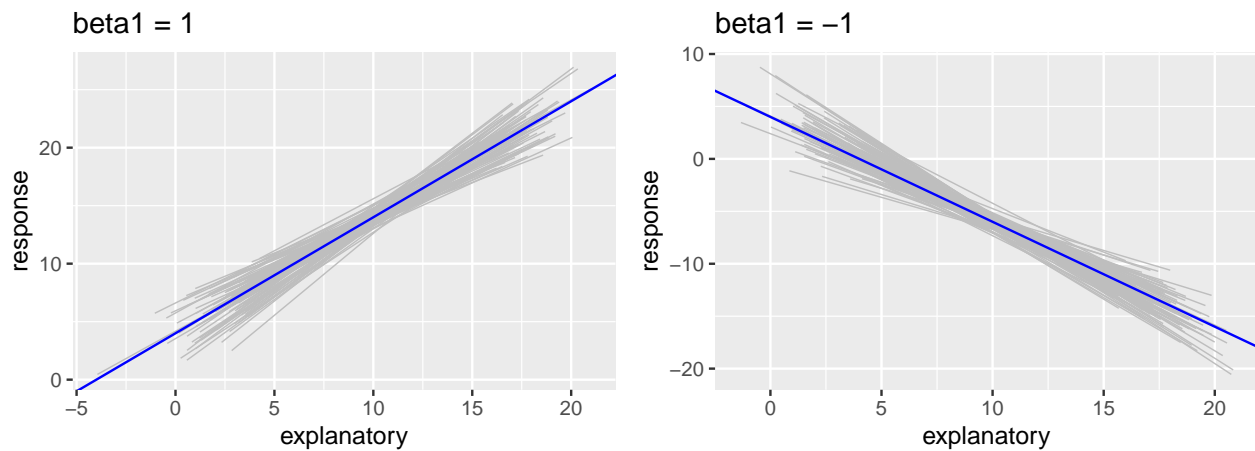
Math 158 - Jo Hardin

Thursday 2/10/2022

Name: _____

Names of people you worked with: _____

Consider the following two simulations. In both cases 100 datasets have been sampled from a huge population, and only the least squares regression line from each of the datasets is plotted. In the left graph, $\beta_1 = 1$. In the right graph, $\beta_1 = -1$.

Are b_0 and b_1 correlated? Explain.

Solution:

b_0 and b_1 are negatively correlated. First of all, to think about whether or not they are correlated, we need to remind ourselves that each of the statistics separately has its own sampling distribution. To say that they are correlated means that after taking a sample and looking at, say, the intercept b_0, you now know something about the slope b_1 (and vice versa). The larger the slope, the lower the intercept (in selecting a random sample). The lower the slope, the larger the intercept.