

WU #22

Math 58B, Spring 2022

Tuesday, April 19, 2022

Your Name: _____

Names of people you worked with: _____

Instructions: Work on this problem in class with your group. Do your best. This piece of paper will be collected during class.

Task: Here we will work with one of the Rossman/Chance applets. Find the applet here: <http://www.rossmanchance.com/applets/2021/regshuffle/regshuffle.htm>

Set up the applet in the following way:

- Click on “Design Population”
 - Change the population slope to equal 1
 - Click on “Create Population”
 - Click on “Show Sampling Options”
 - Change the sample size to 15
 - Take 500 samples from the population
1. What is the SE for the slope statistic?
 2. Let’s say you actually have a dataset (size $n = 15$) from the same population. If the sample you took had given you a $b_1 = 0.3$, what would your T score be? And would you reject $H_0 : \beta_1 = 0$ with that T score?
 3. Was it reasonable of me to suggest that you might have gotten a sample with $b_1 = 0.3$? Explain.

Solution:

1. The sampling distribution of b_1 seems to have a SE of approximately 0.30.
2. If $b_1 = 0.3$, then the T score would be:

$$\text{T score} = \frac{b_1 - 0}{SE} = \frac{0.3 - 0}{0.3} = 1$$

We would not reject $H_0 : \beta_1 = 0$ with a T score = 1.

3. The sampling distribution of b_1 seems to range from about 0 to about 2.0, so a value of $b_1 = 0.3$ is not impossible. However, if the true $\beta_1 = 1$, then the range of values for the majority of b_1 values is (0.4, 1.6). So $b_1 = 0.3$ would be unusual from this population.