

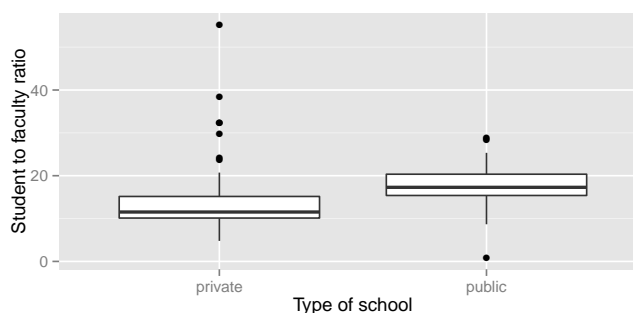
## Application Exercise 2.2: Randomization testing

Your name: \_\_\_\_\_

Write your responses in the spaces provided below. WRITE LEGIBLY and SHOW ALL WORK! Concise and coherent are best!

Student-to-faculty ratio data collected from random samples of public and private four-year colleges:

type	mean	SD	n
private	13.84	7.28	85
public	17.60	4.57	57



1. We would like to test if there is a *difference* between the average student-to-faculty ratio between public and private four-year colleges using a randomization test. What are the hypotheses?
2. Fill in the blanks below for the appropriate set up for this test:

We write the student-to-faculty ratio of each public and private college in this sample on a total of \_\_\_\_\_ index cards. Then, we shuffle these cards and split them into two groups: one group of size \_\_\_\_\_ representing public colleges, and another group of size \_\_\_\_\_ representing private colleges. We calculate the difference between the average student-to-faculty ratios in the public and private colleges ( $\bar{x}_{public} - \bar{x}_{private}$ ) and record this value. We repeat this many times to build a randomization distribution, which should be centered at \_\_\_\_\_. Lastly, we compare the simulated differences with the observed difference by checking the proportion of simulations where the differences in means are \_\_\_\_\_.

3. The dot plot below is created using 100 simulations. Based on the simulation results, does this data provide convincing evidence to suggest that the student-to-faculty ratio in public four-year colleges is different than that of private four-year colleges?

