Thought Experiment Consider the following two variables:

- The `height` of all adults in the United States
- The annual `income` of all working adults in the United States

Think about the distribution of each variable, and discuss the following questions with a neighbor.

1. Sketch a density plot for the distribution. What features does it have? Is it symmetric? Is it normal? It is unimodal?

2. Label the axes on your density plot. What is the range of each variable?

3. How would you summarize each distribution numerically? Which measures are most appropriate?

4. Suppose that the government issued a tax rebate in the amount of $2000 to each American taxpayer. How would the distribution of `income` change? What would happen to your measures of center and spread?

Using a similar approach to the above, sketch out the expected distribution for the following variables:

- number of piercings

- scores on an exam

- IQ scores

Experimental Design Review

1. What is the best way to answer each of the questions below: an experiment, a sample survey, or an observational study that is not a sample survey? Explain your choices.

   (a) Are people generally satisfied with how things are going in the country right now?

   (b) Do college students learn basic accounting better in a classroom or using an online course?

   (c) How long do your teachers wait on average after they ask their class a question?

2. Students sign up to be subjects in a psychology experiment. When they arrive, they are told that interviews are running late and are taken to a waiting room. The experimenters then stage a theft of a valuable object left in the waiting room. Some subjects are alone with the thief, and others are in pairs - these are the treatments being compared. Will the subject report the theft? The students had agreed to take part in an unspecified study, and the true nature of the experiment is explained to them afterward. Do you think this study is ethically OK?