0. Write down the names of everyone in your group, along with a fun fact about him or her.

1. As best you can, try to generate thirty random coin flips in your mind. Write your attempt below.

2. Flip a coin 30 times and write down the outcome (H or T) each time. Compare this truly random experiment with your attempt above. Do you notice any differences in your two sequences?

3. The QUAKE file in our textbook contains information (in chronological order) about the 2,929 aftershocks that occurred, over three weeks' time, after the 1994 Northridge earthquake in California. You are feeling lazy and don't want to analyze the entire dataset (which really wouldn't be difficult!), so you decide to use a subset for your sample. In each of the following cases, what type of data collection plan is used? Do you feel this plan gives a representative sample? Explain your reasoning.

(a) You use the first 10 aftershocks.

(b) You use every 100th aftershock.

(c) You randomly choose 10 numbers between 1 and 2,929 and use the corresponding aftershocks.

(d) You randomly choose an hour of the day (0 to 23) and use all of the aftershocks that happened in that hour.

4. The average magnitude of all 2,929 aftershocks is 2.12. Carry out plans (a), (c), and (d), above (using randomizer.org when appropriate). For each plan, find your sample mean (come see me for the raw data or download it from the course webpage). How do these sample means compare to the population mean? Are you surprised?

5. Do Exercise 1.91 from the Lock[5] book (see below). Give reasons for your answers to parts (d)-(f).

1.91 Green Spaces Make Kids Smarter A recent article[50] claims that "Green Spaces Make Kids Smarter." The study described in the article involved 2,623 schoolchildren in Barcelona. The researchers measured the amount of greenery around the children's schools, and then measured the children's working memories and attention spans. The children who had more vegetation around their schools did better on the memory and attention tests.

(a) What are the cases in this study?

(b) What is the explanatory variable?

(c) What is the response variable?

(d) Does the headline imply causation?

(e) Is the study an experiment or an observational study?

(f) Is it appropriate to conclude causation in this case?

(g) Suggest a possible confounding variable, and explain why it meets the requirements of a confounding variable.