Week 1 Suggested Readings and Practice Exercises

Suggested readings and practice problems from OpenIntro Statistics, 3rd edition (a free online introductory statistics textbook co-authored by Dr. Cetinkaya-Rundel) for this week:

Suggested reading: *OpenIntro Statistics*, 3rd edition, Chapter 4, Section 4.1, 4.2

Suggested exercises: (End of chapter exercises from OpenIntro Statistics)

- Variability in estimates and the Central Limit Theorem: 4.1, 4.3, 4.5, 4.33, 4. 35, 4.37, 4.41
- Confidence intervals: 4.9, 4.11, 4.13, 4.15

(Reminder: the solutions to the end of chapter exercises are at the end of the *OpenIntro Statistics* book)

Test yourself:

1. For each of the following situations, state whether the variable is categorical or numerical, and whether the parameter of interest is a mean or a proportion.

- *In a survey, college students are asked whether they agree with their parents' political ideology.*
- *In a survey, college students are asked what percentage of their non-class time they spend studying.*

2. Suppose heights of all women in the US have a mean of 63.7 inches, and a random sample of 100 women's heights yield a sample mean of 65.2 inches. Which one is the population parameter and which one is the point estimate? Which one is μ and which one is $\bar{x}$?

3. Suppose heights of all women in the US have a standard deviation of 2.7 inches, and a random sample of 100 women's heights yields a standard deviation of 4 inches. Which one is the population parameter and which one is the point estimate? Which one is σ and which one is s?

4. Explain, in plain English, what is going on in Figure 4.8 of the book (page 175).

5. List the conditions necessary for the CLT to hold. Make sure to list alternative conditions for when we know the population distribution is normal vs. when we don't know what the population distribution is, and the when the sample size is barely over 30 vs. when it's very large.

6. Confirm that $z^\star$ for a 98% confidence level is 2.33. (Include a sketch of the normal curve in your response.)