MA117 - Worksheet 6
Point Estimates and Confidence Intervals
March 9, 2021 - Week 2, Tuesday

Problem 1. Determine whether the parameter of interest in each of these situations is a *proportion* or a *mean*.

(a) A survey asks Colorado residents what percentage of their friends were born in Colorado.
(b) A survey asks Colorado residents if they were born in Colorado.

Problem 2. Of all freshman at a large college, 16% made the dean's list in the current year. As part of a class project, students randomly sample 40 students and check if those students made the list. They repeat this 1000 times and build a distribution of sample proportions. What is the variance of this distribution?

Problem 3. Which is wider: a 50% confidence interval or a 95% confidence interval? Explain your answer.

Problem 4. Write down the R command you would use to find z^* for a 99% confidence interval.

Problem 5. A poll conducted in 2013 found that 52% of U.S. adult Twitter users get at least some news on Twitter. The standard error for this estimate was 2.4%, and a normal distribution may be used to model the sample proportion. Construct a 99% confidence interval for the fraction of U.S. adult Twitter users who get some news on Twitter, and interpret the confidence interval in context.

Problem 6. The General Social Survey asked the question: "For how many days during the past 30 days was your mental health, which includes stress, depression, and problems with emotions, not good?" Based on responses from 1151 US residents, the survey reported a 95% confidence interval of 3.40 to 4.24 days in 2010. Interpret this interval in context of the data.