Chapter covered: Chapter 8
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Textbook problems

Problem 1: Exercise 8.3, "Projecting Winning Candidate", Page 340.
Problem 2: Exercise 8.13, "Flu Shot", Page 352.
Problem 3: Exercise 8.23, "Chicken breast", Page 353.
Problem 4: Exercise 8.29, "Females' ideal number of children", Page 362.
Problem 5: Exercise 8.40, "Political views", Page 364.
Problem 6: Exercise 8.48, "Binge drinkers", Page 373.
Problem 7: Exercise 8.52, "Farm Size", Page 373.

R Problems

Problem 1: Let $p =$ proportion of students at UofM who like coffee. A survey takes a random sample of 200 students, and 120 of them say they like coffee.

(a) Use the *prop.test* function in R to give both point estimation and 95% confident interval of p.

(b) Use the formula $\hat{p} \pm z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ to give 95% confidence interval for p.

(c) Do you get the same confidence interval in (a) and (b)?

Note: The confidence interval in (a) and (b) are different, that is because they are using different methods to construct confidence intervals. The method in function *prop.test* is called Wilson's Score method; the method we learned using formula $\hat{p} \pm z_{\alpha/2}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$ is called Simple Asymptotic Method. There are also some other methods to construct confidence intervals for population proportion p. All of them are correct.

Problem 2: You are give 1000 numbers drawn from an unknown population X, the numbers are listed in the file **hw5_R_problem_2.txt**.

(a) Read this file into R, use:

```
dat = read.table("hw5_R_problem_2.txt")$V1
```

Draw both histogram and boxplot for these 1000 numbers. Describe its center, spread, shape.

(b) Calculate 95% confidence interval for the mean of the unknown population X, denoted by μ, using function *t.test*.

(c) Using formula $\bar{x} \pm t \frac{s}{\sqrt{n}}$ to construct the 95% confidence interval for μ. Do you get the same result as (b)? (Note: Be careful with the degree of freedom).