

STAT 310, HW 6

Due: Tuesday, March 23

Reading: Section 5.3 from *OpenIntro*

Directions: Please submit your completed assignment to Blackboard. Your answers can either be typed using Word, or handwritten and then scanned. The best format for submission is PDF. Please convert your Word document or scan to a PDF.

Exercise 1. A Rasmussen Report survey of 1000 US adults found that 42% of respondents believe that raising the minimum wage will help the economy.¹ Do the results of this survey indicate that the population proportion is significantly different than 50%?

- (a) Write the null and alternative hypothesis for a two-sided test.
- (b) Check the conditions for the hypothesis test.
- (c) Calculate the test statistic.
- (d) Calculate the p -value and make a decision using $\alpha = 0.01$ significance level.
- (e) What is the conclusion of the test in the context of the data?

Exercise 2. Some people claim that they can tell the difference between a diet soda and a regular soda in the first sip. A researcher wanting to test this claim randomly sampled 80 such people. He then filled 80 plain white cups with soda, half diet and half regular through random assignment, and asked each person to take one sip from their cup and identify the soda as diet or regular. 53 participants correctly identified the soda. Do these data provide strong evidence that these people are any better than random guessing at telling the difference between diet and regular soda?

- (a) Write the null and alternative hypothesis for a one-sided test.
- (b) Check the conditions for the hypothesis test.
- (c) Calculate the test statistic.
- (d) Calculate the p -value and make a decision using $\alpha = 0.01$ significance level.
- (e) What is the conclusion of the test in the context of the data?
- (f) What type of testing error might we have made?

¹Rasmussen Reports survey, Most Favor Minimum Wage of \$10.50 Or Higher, April 16, 2019.