

Additional Hypothesis Tests Applications

YOUR NAME

26 October, 2020

Exercises

1. Golf balls

Repeat the analysis of the golf ball problem from earlier this semester.

- a. Load the data and tally the data into a table. The data is in `golf_balls.csv`.
- b. Using the function `chisq.test()`, conduct a hypothesis test of equally likely distribution of balls. You may have to read the help menu.
- c. Repeat part b. but assume balls with the numbers 1 and 2 occur 30% of the time and balls with 3 and 4 occur 20%.

2. Bootstrap hypothesis testing

Repeat the analysis of the MLB data from the lesson but this time generate a bootstrap distribution of the F statistic.

3. Test of variance

We have not performed a test of variance so we will create our own.

- a. Using the MLB from the lesson, subset on IF and OF.
- b. Create a side-by-side boxplot.

The hypotheses are:

H_0 : $\sigma_{IF}^2 = \sigma_{OF}^2$. There is no difference in the variance of on base percentage for infielders and outfielders.
 H_A : $\sigma_{IF}^2 \neq \sigma_{OF}^2$. There is a difference in variances.

- c. Use the differences in sample standard deviations as your test statistic. Using a permutation test, find the p-value and discuss your decision.
- d. Create a bootstrap distribution of the differences in sample standard deviations, and report a 95% confidence interval. Compare with part d.