Homework 10

S520, Spring 2019

Due at the beginning of class, Tuesday April 16th. Include all R code. Please upload your file to Canvas no later than 1pm on the due date. Late submission will be accepted (but penalized) before the solutions are posted.

Trosset question numbers refer to the hardcover textbook. Show all work.

1. (5 points) Trosset Section 13.4 Exercise 2.

2. (7 points) Trosset Section 13.4 Exercise 5.

3. (5 points) Trosset Section 13.4 Exercise 11.

4. (12 points) In class we found that the number of goals scored in games of the 2000–01 English Premier League soccer season could be adequately modeled using a Poisson distribution. Does the same hold for the 2014–15 season? Data for this season can be readily found on the internet as a .csv file, a common format for spreadsheet data. You can read it into R using `read.csv()`:

   ```
   EPL201415 = read.csv("http://www.football-data.co.uk/mmz4281/1415/E0.csv")
   ```

   Within the data set, the column "FTHG" contains the number of home goals and the column "FTAG" contains the number of away team goals for each of the 380 games.

   Taking each game as an experimental unit, is the Poisson model a good fit for the following?

   (a) Home team goals?
   (b) Away team goals?
   (c) Total goals (home plus away)?

   Perform appropriate chi-squared tests and state conclusions.

5. (7 points) Is anger associated with heart disease? Williams et al. (2000) gave a sample of 8474 people with no heart disease and normal blood pressure a test to classify their anger as low, moderate, or high. The researchers then tracked the subjects for four years, recording which of them developed heart disease. The results:

   - Of 3110 people with low anger, 53 got heart disease.
   - Of 4731 people with moderate anger, 110 got heart disease.
   - Of 633 people with high anger, 27 got heart disease.

(a) Perform a chi-squared test, giving a test statistic, P-value, and conclusion.

(b) Does this analysis alone prove that anger affects the chance of getting heart disease? Explain why or why not.

6. (2 points) Go to `guessthecorrelation.com` and play the game until you get a score of at least 30. Include a screenshot of your name and high score. (Extra credit if you beat Dr. Luen's high score.)