Statistics for Geography (GEOG 533) Lab 7

Complete the following exercises in Chapter 7 (Correlation) of the textbook pages 222-224. For each question, you need to specify the null hypothesis and why you accept or reject the null hypothesis.

1. Exercise 1 (5 pt.)
2. Exercise 3 (5 pt.)
3. Exercise 4 (5 pt.)
4. Exercise 6 (5 pt.)
5. Exercise 7 (5 pt.)
6. Exercise 8 (5 pt.)
7. Exercise 9 (5 pt.)
8. Exercise 10 (5 pt.)
9. Use the **cars** data frame in the **datasets** package to perform the following tasks (10 pt.):
   a. Plot a scatterplot for the data frame (x: speed, y: dist)
   b. How many rows in the data frame?
   c. Calculate Pearson's correlation coefficient using the equation below
   d. Use the **cor.test()** function to find Pearson's correlation coefficient and compare it to the one from part (c)
   e. Calculate Spearman's rank correlation coefficient using the equation below
   f. Use the **cor.test()** function to find Spearman's rank correlation coefficient and compare it to the one from part (e)

   Pearson's correlation coefficient:

   $$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{(n-1)s_x s_y} \qquad r = \frac{\sum_{i=1}^{n} z_x z_y}{n-1}$$

   Spearman's rank correlation coefficient:

   $$r_S = 1 - \frac{6\sum_{i=1}^{n} d_i^2}{n^3 - n}$$

   t-statistic:

   $$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

What to submit:

1. An R Markdown document that contains the script for each question.
2. An HTML document that contains the script/output for each question.
3. GitHub.io URL for the html document.

File name convention for assignment submissions: lastname_firstname_lab7.zip