Assignment #2 (25 pts)
Due: July 9 at the beginning of class
Instructions: You can work in groups but you must your own R scripts and figures to your own github repository.

1. (5 pts) The data below are the number of points scored in 30 games by the Portland Trailblazers.

Scores: 90,95,89,71,73,96,87,95 107,89,96,80,97,95 102,97,93 101,82,83,74,91,83,98,95 111,99 120,93,84

   a. Estimate the sample mean score. What does the quantity estimate?
   b. Is the estimate in part(a) likely to equal the population parameter? Why or why not?
   c. Calculate the standard error for your sample estimate.
   d. What does the quantity in part(c) measure?
   e. Calculate a 95% confidence interval for the population mean.
   f. Provide an interpretation for the interval you calculated in part (e).

2. (5 pts) Using the following data, test the null hypothesis that male and females have the same mean cholesterol concentrations. Include descriptive statistics, hypothesis testing (e.g., t-test) and 95% confidence intervals.

Male: 220.1, 218.6, 229.6, 228.8,222.0,224.1, 226.5
Female: 223.4,221.5,230.2,224.3,223.8,230.8

3. (5 pts) A clinical trail was carried out to test whether a new treatment has an effect on the rate of recovery of patients. The null hypothesis "H_0: the treatment has no effect" was rejected with a P-value of 0.04. The researchers used a significance level of 5%. State whether the following conclusions is correct. If not, explain why.
a. The treatment has only a small effect.
b. The treatment has some effect.
c. The probability of committing a Type I error is 0.04.
d. The probability of committing a Type II error is 0.04.
e. The null hypothesis would not have been rejected if the significance level was $\alpha=0.01$.

4. (5 pts) The data below are volumes of red blood cells from two individuals. Test the hypothesis (using the Mann-Whitney test) that the red blood cells of person B are 1.5 times the volume of person A.

person A: 248, 236, 269, 254, 249, 251, 260, 245, 239, 255
person B: 380, 391, 377, 392, 398, 374

5. (5 pts) What is the difference between the standard error of mean and the standard deviation? Provide example data that illustrates their difference.