**Assignment #2**

**1. The data below are the number of points scored in 30 games by the Portland Trailblazers.**

a. 92.2  
b. I think the estimate in (a) is likely to equal the population parameter. Because sample size is enough large (=30) and sample mean is good estimator. So it is similar to the population parameter.  
c. On R script  
d. 1.976529  
e. (88.15754, 96.24246)  
f. If repeated samples were taken and the 95% confidence interval was computed for each sample, 95% of the intervals (88.15754, 96.24246) would contain the population mean.

**2. Using the following data, test the null hypothesis that male and females have the same mean cholesterol concentrations. Include descriptive statistics, hypothesis testing and 95% confidence intervals.**  
H0 : Male and female have the same cholesterol value.

P-value = 0.5405, we do not reject null hypothesis under significance level 0.05.  
Male and female have the same cholesterol value.

**3. A clinical trial was carried out to test whether a new treatment has an effect on the rate of recovery of patients. The null hypothesis “H0 : 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. False. P-value does not determine size of effect.  
b. True  
c. False. Type 1 error is 0.05.  
d. False. Type 2 error is 0.95  
e. True.

**4. The data below are volumes of red blood cells from two individuals. Test the hypothesis that the red blood cells of person B are 1.5 times the volume of person A.**

T-test > P-value = 0.07663  
Wilcoxon test > P-value = 0.09923  
So, we do not reject H0 (the red blood cells of person B are 1.5 times the volume of person A).

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

Standard deviation : SD describes the spread of value in the sample. The sample standard deviation is a random variable. It varies from sample to sample. But it stays the same on average when the sample size increases.  
  
Standard error : SE is the standard deviation of the sample mean and describes its accuracy as an estimate of the population mean. When the sample size increase, the estimator is based on more information and becomes more accurate, so its standard error decreases.

I have three random sample from N(2, 9). Sample sizes are 100, 500, 2000





