Assignment 3: Due to Oct 14, 2019

*** Please print your assignment and submit it to the lecturer on the due date, thanks for your cooperation.**

1. The duration of time from first exposure to HIV infection to AIDS diagnosis is called the incubation period. The incubation periods of a random sample of 7 HIV infected individuals is given below (in years):

   12.0 10.5 9.5 6.3 13.5 12.5 7.2

   a. Calculate the sample mean, median, and standard deviation.

   b. Suppose instead of 7 individuals, we had 14 individuals. (we added 7 more randomly selected observations to the original 7)

   12.0 10.5 5.2 9.5 6.3 13.1 13.5 12.5 10.7 7.2 14.9 6.5 8.1 7.9

   Make an educated guess of whether the sample mean and sample standard deviation for the 14 observations would increase, decrease, or remain roughly the same compared to your answer in part (c) based on only 7 observations. Now actually calculate the sample mean standard deviation to see if you were right. How does your calculation compare to your educated guess? Why do you think this is?

2. Assume blood-glucose levels in a population of adult women are normally distributed withmean 90 mg/dL and standard deviation 38 mg/dL.

   a. Suppose the "abnormal range" were defined to be glucose levels outside of 1 standard deviation of the mean (i.e., either at least 1 standard deviation above the mean, or at least 1 standard deviation below mean). Individuals with abnormal levels will be retested. What percentage of individuals would be called "abnormal" and need to be retested? What is the normal range of glucose levels in units of mg/dL?

   b. Suppose the abnormal range were defined to be glucose levels outside of 2 standard

deviations of the mean. What percentage of individuals would now be called "abnormal"? What is the normal range of glucose levels (mg/dL)?

3. Suppose a random sample of 100 12-year-old boys were chosen and the heights of these 100 boys recorded. The sample mean height is 64 inches, and the sample standard deviation is 5 inches. You may assume heights of 12-year-old boys are normally distributed. What's the interval includes approximately 95% of the heights of 12-year-old boys?

4. You sample 36 apples from a farm's harvest of over 200,000 apples. The mean weight of the sample is 112 grams (with a 40 gram sample standard deviation). What is the probability that the mean weight of all 200,000 apples is within 100 and 124 grams (Use Z table).