CSCI 3900C Lab #2 (25 points)

Write an R script to accomplish the following tasks. Please put all code in a single script file, and use comments to identify the different sections. Also use comments for your name at the top.

UPLOAD YOUR SCRIPT TO THE LAB2 D2L Dropbox.

A. In 2012, the distribution of SAT Critical Reading scores (across all test-takers) was approximately normal with a mean of 496 and a standard deviation of 114 (source: Collegeboard.com). Write the code necessary to find and display the following information.
    1. What percent of test-takers obtained a score of 450 or lower?
    2. A student who got a score of 580 is at what percentile?
    3. What score was at the third quartile of the distribution?
    4. How high a score was needed to be at the 80^{th} percentile?
    5. To be in the top 5% of scores, a student would need to have at least what score?

B. Write the code necessary to perform the following tasks.
    1. Generate a sample of size 100 from the uniform distribution between 1 and 10, inclusive.
    2. Display the first quartile of the theoretical uniform distribution.
    3. Display the first quartile of the sample you generated.
    4. Create a histogram of the sample you generated.
    5. Generate a second sample of size 1000.
    6. Display the first quartile of your second sample.
    7. Create a histogram of your second sample.
    8. Generate a third sample of size 10,000.
    9. Display the first quartile of your third sample.
    10. Create a histogram of your third sample.
    11. Add some comments to the end of your script to answer the following questions:
        a. How did the first quartile of your 3 samples compare to each other and to the first quartile of the distribution from which they were drawn?
        b. How did the histograms of your 3 samples compare?
        c. Review (or look up) the “Law of Large Numbers”. What does this law have to do with the tasks you have completed above?