Homework 2
SOCI 303: Statistics for the Social Sciences (Spring 2017)
10 points

Overview:

In this assignment, you'll be completing 3 problems using R. These problems cover topics from Chapters 6 through 8 in your textbook. **Remember to append/copy and paste your R script as the final page of this assignment** (as a new page).

Problem 1 (*The Normal Distribution*)

- Using any mean and standard deviation, plot a normal distribution using $N = 100$ cases. Be sure to show your plot.

- Using any mean and standard deviation, plot a normal distribution using $N = 10,000$ cases. Be sure to show your plot.

- Comment on the differences between the two plots.

Problem 2 (*Sampling*)

- Using the `USArrests` data set in R, take 3 random samples of $N = 20$. Remember to give each sample a unique object name so you can do subsequent calculations.

- Calculate the means and standard deviations for the `Murder` variable for each sample.

- Comment on the differences between the 3 means, and on the differences between the 3 standard deviations. Do they differ? Why or why not?

Problem 3 (*Estimation*)

- Report the following formulas:

  - Z-score
  - 99% confidence interval
  - Standard error of the mean of the sampling distribution ($S_{\bar{Y}}$)

- Using the `USArrests` data set in R, calculate the mean, standard deviation, and the sampling error of the mean of the sampling distribution for the `Assault` variable. Do not save these as new variables in the data set.

- Calculate the z-scores for the `Assault` variable for all observations and save this as a new variable in the data set. Report the z-score value (of the `Assault` variable) for the 12th observation.

- Calculate the 99% confidence interval for the `Assault` variable. Report the lower and upper bounds/values of this confidence interval.