**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**NOTE: Type your answers in the appropriate fields; please make answer fields larger as needed. Please turn in a printed copy to Joe during next Friday’s lab or Melissa’s mailbox by 12 PM next Friday (please contact Melissa regarding exceptions; e.g., illness and travel). Please note, assignments will lose 5% of the total possible points for each day they are late.**

*Conceptual Questions*

1. What are the formulas for SD? Describe in your own words what standard deviation describes in a distribution.
2. What expectations do we have given the central limit theorem (i.e., what are the claims of the central limit theorem)? In your own words explain what these expectations mean and why they make sense conceptually.

*Computational Problems*

Use the same data set from last week, HW01Data.csv.

1. a. Create a histogram of weight. Create a unique figure title and label the x-axis.

b. Create a density plot of height. Create a unique figure title and label the x-axis. Add a solid black vertical line to the plot at the mean value of height. Add a dotted black vertical line to the plot at the median value of height. \*Make sure you look at the lines() function syntax to learn about the argument for line types.

Code/Syntax:

Answer:

1. Calculate the mean, median, variance, minimum, and maximum values of BMI for each unique condition of biological sex and education completed—you’ll need to calculate BMI again using the formula provided in HW01 (if you saved your syntax you can copy and paste that). Summarize these values in a table. Comment on how these groups compare on these statistics.

Code/Syntax:

Answer:

1. a. Identify the rows with the maximum and minimum BMI values. What are the row numbers and the maximum and minimum BMI values?

b. Standardize BMI values so that they have a mean of zero and standard deviation of one. Now identify the rows with the maximum and minimum standardized BMI values. What are the row numbers and what are the maximum and minimum standardized BMI values?

c. Standardize BMI values so that the mean is 100 and the standard deviation is 15. Identify the rows with the maximum and minimum standardized BMI values. What are the row numbers and what are the maximum and minimum standardized BMI values.

d. What conclusions can you draw about linear transformations of data based on your answers to the preceding questions (i.e., 5a-5c)?

Code/Syntax:

Answer: