Assignment 5

Part 1: Based on Handout 5 R, use R (as needed) to answer the following questions. Make sure you include clear headings (e.g., Handout 5 R or Handout 5 SAS). For each part of the question, make sure you include the command line/code, then paste relevant output/results, and also comment on the output/results as needed (to answer the questions).

1. Using the following function (which was downloaded with the data set), plot all intervals. What proportion of your confidence intervals include the true population mean? Is this proportion exactly equal to the confidence level? If not, explain why.

```
plot_ci(lower_vector, upper_vector, mean(population))
```

2. Pick a confidence level of your choice (NOT 95% or 99%). What is the appropriate critical value? Run it and attach the output. How does it differs from the 95% confidence interval?
3. Calculate 50 confidence intervals at the confidence level you chose in the previous question. You do not need to obtain new samples, simply calculate new intervals based on the sample means and standard deviations you have already collected. Using the `plot_ci` function, plot all intervals and calculate the proportion of intervals that include the true population mean. How does this percentage compare to the confidence level selected for the intervals?

Part 2: Based on Handout 5 SAS, apply SAS to answer the above questions. Make sure you include clear headings (e.g., Handout 5 R or Handout 5 SAS). For each part of the question, make sure you include the command line/code, then paste relevant output/results, and also comment on the output/results as needed (to answer the questions).

1. Using the following code, determine whether the true population mean was captured by the intervals. Within the DATA step, the Boolean expression will flag **captured**=1 when the true population mean is within the confidence limits and 0 otherwise. To determine what proportion of your confidence intervals includes the true population mean, we compute the average of this binary variable with PROC MEANS. Is this proportion exactly equal to the confidence level? If not, explain why.

```
data work.reprun;
   set work.reprun;
   captured = (s_lower le &popmean le s_upper);
run;

proc means data=work.reprun mean;
   var captured;
run;
```

2. Pick a confidence level of your choice (NOT 95% or 99%). What is the appropriate critical value? Run it and attach the output. How does it differs from the 95% confidence interval?
3. Calculate 50 confidence intervals at the confidence level you chose in the previous question. Adjust the code to accommodate the confidence level you selected. Calculate the proportion of intervals that include the true population mean. How does this percentage compare to the confidence level selected for the intervals?

Part 3: Save your file as ***DA460_Assignment5_XXXXX.docx (or .pdf)*** where ***XXXXX*** is the first five letters of your last name, and submit it online.