

ST 551: Statistical Methods I

Fall 2023

Homework 0

Due: 11:59 pm Friday October 6

10 Points Total

- 1) Read the Brief Introduction to R (RIntroduction.pdf) document posted in Module 1. For more details and information, a good reference is 'An Introduction to R' from the CRAN website:

<https://cran.r-project.org/doc/manuals/R-intro.pdf>

- 2) Download and install R. Start an R session as described in Section 1 of the RIntroduction document.

Note: Rstudio is a user interface for R that makes window and file management easier, and provides some useful abilities to create Word documents that contain your R code and output. I recommend investigating Rstudio if you are interested in these capabilities:

<https://posit.co/download/rstudio-desktop/>

There is a brief introduction to Rstudio in the Week 0 Module: 'RStudioIntro.pptx'

- 3) Run through the examples in Sections 1 and 2 of the RIntroduction document, and try modifying the values and operations to make sure you understand what R is doing. Experiment!
- 4) Open a script file in Rstudio as described on Slide 8 of the 'RStudioIntro' powerpoint document. Use this script file to document and save the code you create for the portions of this homework that you will hand in. Be sure to save this script file in the working directory (file folder) where you will be saving all of your homework files and the necessary datasets, etc.
- 5) **Store all of the code for this part in your script file. You will hand in this portion.** Use Google, ask in office hours, or use the ``help()`` function in R to figure out how to do the following:

- a. Use the `'rnorm()'` function to generate a sample of $n = 100$ observations from a Normal distribution with mean parameter = 12 and standard deviation parameter = 3. Assign this sample the name `'samp1'`.
 - b. Find the *sample mean* of this sample using the `'mean()'` function.
 - c. Find the *sample standard deviation* of this sample using the `'sd()'` function.
 - d. Make a histogram of this sample using the `'hist()'` function. Note that you can change the size of the histogram bins by setting `'breaks = '` argument. Make another histogram where the bins are of size 1, with breaks at the integers.
- 6) **What to hand in:** Create a document with your R code and output, and with the resulting figures in the appropriate places. There are a couple ways you can do this:
- a. Use the Rstudio 'Knitr' functionality to compile a .Rmd file as a .docx file, which you can then save as a pdf. There is more information on this approach here:

<https://rmarkdown.rstudio.com/lesson-1.html>
 - b. Or you can store your code in a .R file, and create a separate .docx/.pdf file on your own. To copy and paste pictures:
 - i. Right click in the plot window, and select copy. Then just paste into the document, OR...
 - ii. Store your figures from R to a pdf or jpeg file by using the `'pdf()'` or `'jpeg()'` functions. See the help documents for these functions, or ask in office hours, if you have questions about how to use them. Then import the resulting figures, or open the resulting figure files (which will be stored in your working directory), and copy and paste them into your homework document.

7) **Submit your document (pdf or doc/docx) on Gradescope by uploading it.**