Introduction to Programming in R - STA 521

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1 Agenda

1. Installing R-Studio.

2. Markdown and why you should know it.

3. Initializing variables: storing, some variable types, length of vectors, summary statistics, printing and seeding

4. Indexing: accessing elements, dropping elements and adding elements.

5. Loops: while loops and for loops.

6. Matrices: matrix math, eigen vectors, determinants.

7. Basic Graphics: scatterplots, histograms and box-plots.

8. Reading Data into R: text data, delimiter type, comma separated values.

9. Writing Basic Functions.

2 Lab Tasks

1. Store three vectors using rnorm() of length $n = 100$ as Var1, Var2, and Var3.

2. List all the items currently in the environment.

3. Store Var1 in a 10×10 matrix. Call this myMatrix.

4. Create a scatterplot of Var1 vs. Var2. On the same plotting window include histograms of Var1 and Var2.

5. Write a function that takes as its inputs, $p = 2$, n-dimensional vectors and a vector of length p containing the names of these vectors. Your function combine these two vectors into a data.frame(), get the row-wise maximum and store this in a new vector. Finally produce a box-plot of this vector, store it as a separate .pdf, and return the mean value of this vector.

3 Directions

In general for Labs, at the top of any file you are asked to submit, please list the following:

1. First Name Last Name

2. Lab Date

3. Team Member(s)

With respect to any item for which you are asked to generate any output, please provide the actual R output as a part of your solution and any explanation needed as well. For any functions/ computations that you will write, please list the following as comments before the step in R:

1. Task number and descriptions.

2. Input(s) with descriptions.

3. Outputs(s) with descriptions.

4. Function/ output summary (along with intermediate step comments).

For Lab 1, please provide the following deliverable items:

1. Please provide your solutions using Markdown as a .pdf with the following naming convention: LastName_FirstName_Solutions_Lab1.pdf.

2. Provide your .Rmd file (this **MUST** compile) for the lab using the following naming convention: LastName_FirstName_Solutions_Lab1.Rmd

3. a .pdf file containing the box-plot from the last task using the following naming convention: LastName_FirstName_Solutions_myPlot.pdf.