Stat 6021: Module B Practice Questions

Topic B.2: Getting Started with R

1. The `mtcars` dataset comes built-in with R. The dataset was extracted from the 1974 Motor Trend US magazine and comprises several characteristics of automobile design and performance for 32 automobiles (1973 to 74 models).

    (a) Read this data in and assign it to an object called `cars.df`

    (b) Use the environment window and report how many observations and variables are in this dataset.

2. Download the dataset "students.txt" from Collab. The dataset contains information on students taking an introductory statistics class at a large public university.

    (a) Read this data in and assign it to an object called `students.df`

    (b) Use the environment window and report how many observations and variables are in this dataset.

3. Install the following packages:

    (a) `tidyverse`

    (b) `faraway`

    (c) `MASS`

    (d) `leaps`

    (e) `ROCR`

    (f) `nycflights13`

    (g) `gapminder`

    (h) `palmerpenguins`

4. Load the `faraway` package, and read in the dataset called `cornnit` and assign it to an object called `corn.df`

Topic B.3: Data Types & Structures in R

5. Are the following valid names for objects in R?

   (a) `2020_Major`

   (b) `.2020.Age`

   (c) `#Courses.2020`

   (d) `_courses_2020`

   (e) `Fav_Sport20`

   (f) `major 2020`

   (g) `age(2020)`

   (h) `FavSport_2020`

6. Create a numeric vector with the following 10 values

$$13, 91, 36, 95, 9, 3, 61, 20, 22, 97$$

   Assign these 10 values to a vector called `practice`. Use R to find out if `practice` is a character, numeric, or logical type.

7. For each of the following, determine if they are `TRUE` or `FALSE`. Try answering first without using R, then use R to confirm.

   (a) `practice[5]==5`

   (b) `practice[10]!=97`

   (c) `(practice[1]+practice[2])<104`

   (d) `(practice[1]+practice[2])<=104`

   (e) `(practice[2]==91) & (practice[9]==22)`

   (f) `(practice[5]<9) | (practice[6]>=4)`

8. Create the following matrix in R

$$\begin{bmatrix} 4 & 1 & 3 \\ 6 & 2 & 1 \end{bmatrix}$$

   and assign it to the object `Mat.A`.

   (a) Give the following column names to `Mat.A`: "Huey", "Dewey", "Louie".

   (b) Without using R, what is the output if we type `Mat.A[2,1]`?

   (c) Without using R, what is the output if we type `dim(Mat.A)`?

9. Convert the vector `practice` to a factor. What is the order of the levels in this factor?

Topic B.4: R Markdown

10. Type up your answers to these questions using R Markdown, and output an HTML file.