Skill Check 1: Basics of R

Exam Agreement

This Skill Check is an individual assessment and you should not receive or offer help on it from any other human. Cell phones are to be handed in to the instructor and all other digital devices must be stored in bags underneath the bench of in the lab cubbies.

You may use any **physical** resource to complete the work. This includes:

- Any notes, code, slides, papers, or previous feedback from the instructor as long as they are on paper.
- Any books that you have with you.
- Any scholarly works such as papers that you have with you.

You may NOT use:

- Help from any other student or person. **This is an individual assessment.**
- Any digital resource that does not exist as a physical copy present in class.
- The use of generative artificial intelligence (e.g., ChatGPT).
- Help from homework websites such as Course Hero or Chegg.

By signing, you agree that you have neither given nor received unauthorized aid on this examination.

Printed Name: _____

Chapman ID: _____

Signed: _____

Date: _____

Include this signed page as the first page of your submitted work.

Skill Check Instructions

You must answer every question on the exam to the best of your ability. Include all appropriate code, syntax, and functions that would lead to the code to run successfully.

Question 1: Access help

You've just installed and loaded the package `ape` and are looking to use the function `drop.tip()`. Write out how you would look up the help documentation for this function in the command line.

Question 2: Basic syntax

In one line of code, multiply the numbers `3`, `5`, and `18` together and assign the output to an object named `multi_dat`.

Question 3: Vectors

In one line, create a vector consisting of a sequence of numbers 0 to 400 that is length 763 and store it as `vec1`. What is the value of the 345th element of `vec1`?

Question 4: Matrices and Arrays

Create a matrix of random numbers that is 60 by 100. Store it as `my_matrix1`. In a second line, retrieve the value of the 44th column and the 23rd row of `my_matrix1`.

Question 5: Lists

I have created a list stored with the name `my_list` with the following code:

```
my_list <- list("flower" = c(1, 4.9, 18, 38, 20, 10.02),
                "micha" = matrix(runif(30), nrow = 5),
                "color" = data.frame("x" = c(1.1, 1.2, 1.3),
                                     "y" = c(2.3, 5.6, 6.2)),
                 1:40)
```

How many members does this list contain? What data class is each member? How would you reference the integer 3 in `my_list`?

Question 6: Data frames

Calculate the mean number of breaks in the `warpbreaks` data set if the tension is either low (`L`) or medium (`M`).

```
warpbreaks      54 obs. of 3 variables
    $ breaks : num  26 30 54 25 70 52 51 26 67 18 ...
    $ wool   : Factor w/ 2 levels "A","B": 1 1 1 1 1 1 1 1 1…
    $ tension: Factor w/ 3 levels "L","M","H": 1 1 1 1 1 1 1…
```

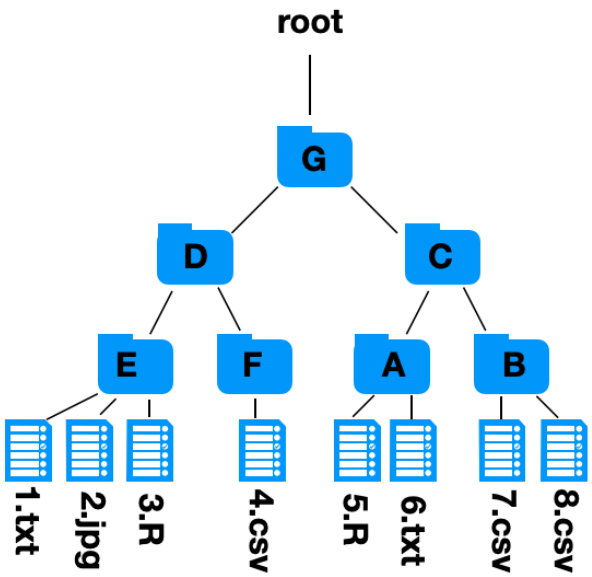
Question 7: Data Classes

List the five atomic data classes in R and give an example of each.

Question 8: Factors

Create an ordered factor vector with the levels good $<$ better $<$ best to describe your preference for the following sports: baseball, hockey, basketball, football, soccer.

Question 9: Filesystems



Write out the absolute path to file 5.R.

Question 10: Troubleshooting

For the data set below:

```
iris          150 obs. of 5 variables
    $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9…
    $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3…
    $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4…
    $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2…
    $ Species     : Factor w/ 3 levels "setosa","versicolor"…
```

Correct the following line of code:

```
mean(iris$sepal.length(iris$species == "setosa"))
```