Lab 1- Exercises

1.)

a) Do variables have to be single letters?

b) What does the object not found error mean?

c) Does R recognize implicit multiplication?

d) Once I use a variable, can it change?

2.)

a) Does R know what the value for e is? (e is approximately 2.718). How could I get R to return the value for e using the exp() function?

b) R does know the value of pi. What happens if you try to name a new variable pi? Why is this something to watch out for?

3.)

a) Explain the problem with changing factors into numeric values directly using as.numeric(). What is the work around for this?

b) Explain why you should be careful with data that is read into R as factors. How could this pose potentially unforeseen challenges to data analysis?

c) Why might there be different classes in R?

4.)

a) If you make the vector (1, 2, 10) and call it “vector1”, and you want R to return the second element, what code would you use?

b) Are vectors indexed from 1 in other languages such as Matlab or Java?

5.)

a) What is the purpose of paying attention to style when writing code?

b) When would you want to set your working directory?

6.)

a) I’m writing code for a simulation about a plant that needs water. The plant starts out with 100 units of water, and gets dry when the water goes below 20 units. Every unit of time, the plant loses some amount of water, which can vary based on random things like wind, light, temperature, etc. In this simulation, it loses 1, 2, 3, or 4 water each timestep. I want to know how much time it takes for a plant to get dry. I wrote the following “while” loop for this situation, but it will not run, and keeps returning an error! Can you tell me why?

> water<-100

> dry<-F

> timevar<-0

> while(dry=F) {

water<-water-sample(c(1,2,3,4),1)

timevar=timevar+1

if(water<20) {dry=T}

}

b) Write a for loop to create a random sample of 50 times that it would take for the plant to get dry. You can include the code from above as part of your answer.

7.)

a) Using the “mice” data set, create a histogram of mouse lengths.

b) How could I visualize whether the mice differ in weight by color? Create the graph.

8.)

a) What is the purpose of installing packages?

b) Why is it best to install dependencies when you install an R package?

9.)

a) Refer to question 6. Write a function that takes in water level of a plant and outputs the time until it gets dry. Try to have the function output 0 if the plant is already dry.

b) Say that a plant can be either drought resistant or not drought resistant. If it is drought resistant, it loses only half the water each time step. Say the original function you wrote is for just the non-drought-resistant plant. Rewrite the function so it can also take in whether or not the plant is drought resistant.

10.)

a) Open the help file for the function “points” which can be used to add points to a plot. What do the graphical parameters “pch”, “col”, “cex”, and “lwd” mean?