Pretest

23 January, 2023

This pretest is designed for me to better to understand your prior knowledge of R and statistical computing. There is no harm in leaving a question blank if you do not know the answer. This does not count toward your grade

Please put your name at the top of this sheet of paper. You have 10 minutes to answer all of the questions below. The pretest is openbook – you may use R, Google, etc. Please write your answers on the paper below.

1. Write code to calculate the mean of a vector, `x`, using only standard arithmetic operations and the `sum()` function and any other functions except `mean()`.

```
sum(x)/length(x)
```

2. I want to make a function that will take a numeric vector, `xvec` as input, and add 2 to every element, and return the updated vector. Write in the necessary code to complete the function below.

```
myFunction <- function(x){
  x+2
}
```

3. Write out *three* ways to access the first element of `myList`.

```
myList <- list(letters = c("a", "B", "C"), numbers = c(1,2,3))
myList[[1]]
```

```
## [1] "a" "B" "C"
```

```
myList[["letters"]]
```

```
## [1] "a" "B" "C"
```

```
myList[[-2]]
```

```
## [1] "a" "B" "C"
```

4. Write in words what the following R code accomplishes. You can assume that both inputs are vectors of the same length.

```
thisFun <- function(vec1, vec2){
  output <- FALSE
    for(i in 1:length(vec1)){
      if(vec1[i] == vec2[i]){
        output <- TRUE
      }
    }
  return(output)
}
```

`thisFun()` returns `TRUE` if any element in the same position in `vec1` and `vec2`, say the fourth element, is the same.

5. Identify the flaw in the following code:

```
x <- 1
while(x <= 20){
x <- (1 - x/20)
}
```

The `while()` loop will never exit. `x` will always be smaller than 1 for infinite iterations.

6. What would the code below accomplish, assuming that the file `Simulations.csv` already exists?

```
cat("\n", file = "~/Simulations.csv", append = TRUE)
```

It would append an empty row to the end of the file.

7. What function can I use to add the point $(2, 1)$ to an existing plot?

The `points()` function.