**Assignment: Coding Practice #1**

* R can perform basic mathematical operations.
* We can create R objects using numeric values and characters (within quotes).

Example: x <- 4 or x <- “Apple”. These are scalar objects.

Numeric and non-numeric data cannot be added.

* **Function:** something that does something to an object. There are built-in basic functions in R, some of them are mean(), median(), sd(), sqrt(), exp(), log(), etc.
* To create a vector object, several scalar elements will be combined using a concatenate function, i.e., c() in one object.

Example: x1<- c(1,2,3,4) #numeric vector

x2<- c(“Nala”, “Nova”) #character vector

another kind of vector is a logical vector: x3<-c(TRUE, FALSE)

* **Logical operators**

== means exactly equal to

!= means not equal to

| means OR

& means AND

t<- 1:12

t[(t>7)] #t such that t is greater than 7

t[(t>7) | (t<3)] #values of t such that t is greater than 7 or less than 5

t[(t>10) & (t<12)] #values of t such that t is greater than 10 and less than 12

t[t!=5] #elements of t that are not exactly equal to 5

20 %in% t #ask R if 20 exists in a vector t

* **Data types**

Mostly, we use data frames (.csv or .txt files from Excel)

Other data types are matrices, lists, scalar objects, vectors.

* **Matrices**

can use the matrix function to create a matrix and can only contain one data class, either numeric, character, or logical.

Example: mat1<-matrix(data=c(1,2,3), nrow=3, ncol=3) #numeric matrix

mat2<-matrix(data=c(“Nala”, “Nova”, “Dallu”), nrow=3, ncol=3)

To find elements within matrix: mat1[1,3] #first row third column

mat1[1] #returns the element from row1 column 1

mat1[3] #returns the element from row3 column 1

mat1[5] #returns the element from row2 column 2

mat1[8] #returns the element from row2column 3

* **Data frames**

Data frames are like matrices but with multiple data classes or data types like numeric and character.

Example: df<- data.frame(mat1[,1], mat2[,1]) #create a data frame with first column of mat1 and mat2 and all rows.

Colnames(df)<- c(“value”, “catsname”)

df[1] #gives entire first column

df[1,2] #gives first row second column

df[,“catsname”] #gives elements of column “catsname”

Similarly, df$catsname # gives elements of column “catsname”

* **Subsetting**

df$value[df$catsname==c(“Nala”, “Nova”)] #return elements of column value within data frame df for names Nala and Nova

df$value[!df$catsname %in% c(“Nala”, “Nova”)] #return elements of the column value within data frame df such that the name is not equal to Nala and Nova

subset function: subset(df, catsname == “Nala”) #returns all rows with Nala in catsname column

add columns: df$log\_value<-log(df$value) #create a new column with header name log\_value will be added with values of log of “value” column within df

* **Installing packages**

install.packages() function used to install packages (usually for packages that are available in the default repository, i.e., CRAN repository

library() function to load the packages

For packages from other repositories, search for packages and copy and paste the code to download it.

* **Load data into R**

datum<- read.csv(“path to your data or name of your file”, na.strings= “na”)

na.strings for missing data in your file which is filled as na in the cell.

I was familiar with most of the codes and features of R given for this assignment. I practiced all the codes in R and have written the brief notes for all the topics covered in the lectures above.