Questions:

1. Use a nested for loop (a for loop inside a for loop) that produces the following matrix, pre-allocate the matrix with NA values.
   0 1 2 3 4
   1 0 1 2 3
   2 1 0 1 2
   3 2 1 0 1
   4 3 2 1 0

   Code & Output:

```
> x<-matrix(data=NA,nrow=5,ncol=5)
> for(i in 0:4){
+    for(j in 0:4){
+      x[i+1,j+1]=abs(j-1)
+    }
+ }
> x
     [,1] [,2] [,3] [,4] [,5]
[1,]    1    0    1    2    3
[2,]    1    0    1    2    3
[3,]    1    0    1    2    3
[4,]    1    0    1    2    3
[5,]    1    0    1    2    3
```

2. Using the following variable:
   x=100
   y=50
   i=1
   For this exercise, write a repeat () loop that incrementing i computes x=x-i and y=y+i until x<y.
   Code & Output:

```
> x=100
> y=50
> i=1
> repeat
+ {
+    x=x-i
+    y=y+i
+    if(x<y)
+        break
+ }
> print(x)
[1] 74
> print(y)
[1] 76
> |
```

3. Find out the river length less than 400, if so, identify it as short river. count the number of short rivers. if the river length is > 800, then it is long. count the number of long rivers. (Use revier dataset)

Code & Output:
```
> d=read.csv("C:/Users/Sashank K/Desktop/River_Dataset.csv")
> d
   Sno rivername length category
1    1    river1    995       NA
2    2    river2   1186       NA
3    3    river3    959       NA
4    4    river4    414       NA
5    5    river5    202       NA
6    6    river6    290       NA
7    7    river7    531       NA
8    8    river8   1047       NA
9    9    river9   1096       NA
10  10   river10    378       NA
11  11   river11    487       NA
12  12   river12    209       NA
13  13   river13    615       NA
14  14   river14   1092       NA
15  15   river15    647       NA
16  16   river16    847       NA
17  17   river17   1205       NA
18  18   river18    605       NA
19  19   river19   1198       NA
20  20   river20   1089       NA
21  21   river21    915       NA
22  22   river22    981       NA
23  23   river23   1295       NA
24  24   river24    378       NA
25  25   river25    332       NA
26  26   river26   1062       NA
27  27   river27    285       NA
28  28   river28    955       NA
29  29   river29    449       NA
30  30   river30    335       NA
31  31   river31    500       NA
32  32   river32   1018       NA
33  33   river33   1095       NA
34  34   river34   1085       NA
35  35   river35    321       NA
36  36   river36    800       NA
```

```
> for(i in d$length){
+   if(i<400){
+     c1=c1+1
+   }else if(i>800){
+     c2=c2+1
+   }
+ }
> print(paste("No of Short Rivers is: ",c1))
[1] "No of Short Rivers is:  155"
> print(paste("No of Long Rivers is: ",c2))
[1] "No of Long Rivers is:  382"
>
```

4. Using an if -else find out the largest animal based on overall sample size.
   (Use animal dataset)

   Code & Output:

```
> animal<-read.csv("C:/Users/Sashank K/Downloads/Animal dataset.csv")
> large=0
> animal$Overall.Sample.Size[is.na(animal$Overall.Sample.Size)] <-
+   mean(animal$Overall.Sample.Size, na.rm=TRUE)
> for (i in animal$Overall.Sample.Size){
+   if(large < i){
+     large = i
+   } else {
+     large=large
+   }
+ }
> name<-
+   animal$Species.Common.Name[animal$Overall.Sample.Size==large]
> print(paste("The largest animal based on overall sample size is ",name))
[1] "The largest animal based on overall sample size is  Flamingo, Chilean"
>
```

5. Count how many males are in underweight and overweight. you need to
   measure with ounce. 1 ounce=28.34 gm. (Use BMI Dataset)

   Code & Output:

```
> weight<-read.csv("C:/Users/Sashank K/Downloads/bmi_data.csv")
> count1=0
> count2=0
> weight$BMI[is.na(weight$BMI)]<-mean(weight$BMI,na.rm = TRUE)
> for (i in weight$BMI[weight$Sex=="Male"]){
+   if(i < 18.5){
+     count1 = count1+1
+   } else if (i > 25) {
+     count2 = count2+1
+   }
+ }
> print(paste("The no of under weight males are ",count1))
[1] "The no of under weight males are  3685"
> print(paste("The no of over weight males are ",count2))
[1] "The no of over weight males are  4"
```

6. create a dummy dataset with numeric values. a) write a function for calculating the mean. b) Write a function to compute standard deviation.

Code & Output:

```
> vector<-c(11,22,56,21,45,12)
> me<-function(a)
+   {
+   m=0
+   n=length(a)
+   for(i in a){
+     m=i+m
+   }
+   mn=m/n
+   print(paste("The mean od the given numbers in dummy dataset is: ",mn))
+ }
> std<-function(a){
+   n=length(a)
+   s=sqrt(sum((a-mean(a))^2/(n-1)))
+   print(paste("The standard deviation of the given numbers in the dummy dataset is: ",s))
+ }
> me(vector)
[1] "The mean od the given numbers in dummy dataset is:  27.8333333333333"
> std(vector)
[1] "The standard deviation of the given numbers in the dummy dataset is:  18.454448424883"
```