SESSION 3: FOUNDATIONALR PROGRAMMING

Assignment 1

1. Define an m x n matrix of zeros and then enters a nested-for loop to fill the locations of the matrix, only if the two indexes differ.

- The purpose is to create a lower triangular matrix, that is a matrix whose elements below the main diagonal are non-zero, the others are left untouched to their initialized zero value.
- When the indexes are equal (if condition in the inner loop, which runs over j, the column index), a break is executed and the innermost loop is interrupted with a direct jump to the instruction following the inner loop, which is a print; then control gets to the outer for condition (over the rows, index i), which is evaluated again.
- If the indexes differ, the assignment is performed and the counter is incremented by 1.
- At the end, the program prints the counter ctr, which contains the #number of elements that were assigned.

Answer:

```
m <- 10                 #Assigning 10 to m
n <- 10                 #Assigning 10 to n
ctr <- 0                #initializing ctr to 0
zeroMat <- matrix(0,m,n)    # creating matrix of m x n with all zero values

for ( i in 1:m){                    # outter for loop to loop rows
        for (j in 1:n){             # inner for loop to loop columns
            if (i == j ) {break}    #condition to check if both the index matches, if match exit inner for loop
            zeroMat[i,j] = 1        # if index differ assign  1 to the matrix pointer
            ctr = ctr +1            # increment the counter
    }
}
print(paste("No. of increments is " , as.character(ctr)))       # print the no of items assigned / incremented
zeroMat                                                         # print matrix zeroMat
```