Problem Statement

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.

Attached r file .

Below is output of code.

```
> matrix1 <- matrix(0,10,10)
> ctr<-0
> for(i in 1:10){
+   for (j in 1:10){
+     if (i==j){
+       print(i)
+       print(j)
+       break }
+     matrix1[i,j]<-1
+     ctr<-ctr+1
+       }
+ }
[1] 1
[1] 1
[1] 2
[1] 2
[1] 3
```

```
[1] 3
[1] 4
[1] 4
[1] 5
[1] 5
[1] 6
[1] 6
[1] 7
[1] 7
[1] 8
[1] 8
[1] 9
[1] 9
[1] 10
[1] 10
> ctr
[1] 45
> matrix1
      [,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
 [1,]    0    0    0    0    0    0    0    0    0     0
 [2,]    1    0    0    0    0    0    0    0    0     0
 [3,]    1    1    0    0    0    0    0    0    0     0
 [4,]    1    1    1    0    0    0    0    0    0     0
 [5,]    1    1    1    1    0    0    0    0    0     0
 [6,]    1    1    1    1    1    0    0    0    0     0
 [7,]    1    1    1    1    1    1    0    0    0     0
 [8,]    1    1    1    1    1    1    1    0    0     0
 [9,]    1    1    1    1    1    1    1    1    0     0
[10,]    1    1    1    1    1    1    1    1    1     0
```