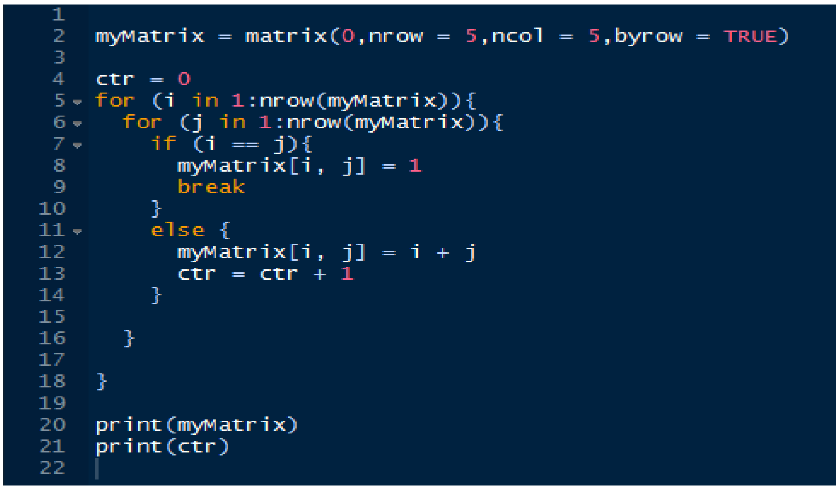
Problem Statement:

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.

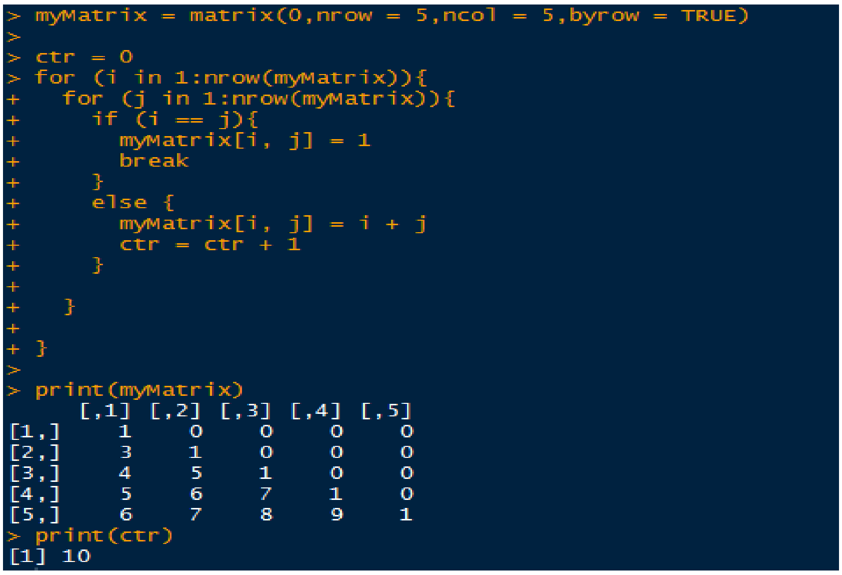
Solution Statement:

R Code



```

myMatrix = matrix(0,nrow = 5,ncol = 5,byrow = TRUE)

ctr = 0
for (i in 1:nrow(myMatrix)){
  for (j in 1:nrow(myMatrix)){
    if (i == j){
      myMatrix[i, j] = 1
      break
    }
    else {
      myMatrix[i, j] = i + j
      ctr = ctr + 1
    }

  }

}

print(myMatrix)
print(ctr)

```

R Output



```
> myMatrix = matrix(0,nrow = 5,ncol = 5,byrow = TRUE)
>
> ctr = 0
> for (i in 1:nrow(myMatrix)){
+   for (j in 1:nrow(myMatrix)){
+     if (i == j){
+       myMatrix[i, j] = 1
+       break
+     }
+     else {
+       myMatrix[i, j] = i + j
+       ctr = ctr + 1
+     }
+
+   }
+
+ }
>
> print(myMatrix)
     [,1] [,2] [,3] [,4] [,5]
[1,]    1    0    0    0    0
[2,]    3    1    0    0    0
[3,]    4    5    1    0    0
[4,]    5    6    7    1    0
[5,]    6    7    8    9    1
> print(ctr)
[1] 10
```