

## Assignment3.1

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*#Problem Statement*

*#1. Define an  $m \times n$  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*

*# 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*

*# 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.*

*#install.packages("Matrix")*

```
x <- as.data.frame(matrix(1:4,4,4))
```

```
x[upper.tri(x,diag=TRUE)] <- 0
```

```
x
```

```
##   V1 V2 V3 V4
```

```
## 1  0  0  0  0
```

```
## 2  2  0  0  0
```

```
## 3  3  3  0  0
```

```
## 4  4  4  4  0
```

```
ctr=0
```

*# increment by w when the indexes are different*

```
for (r in 1:nrow(x))
```

```
  for (c in 1:ncol(x))
```

```
  {
```

```
    if(r==c)
```

```
    {
```

```
      print(paste("We are at Row", r, "and column",c, " it has values of",  
x[r,c]," hence skip increment"))
```

```
    }
```

```

else
{
  x[r,c]=x[r,c]+1
  ctr = ctr+1
}
}

## [1] "We are at Row 1 and column 1  it has values of 0  hence skip
increment"
## [1] "We are at Row 2 and column 2  it has values of 0  hence skip
increment"
## [1] "We are at Row 3 and column 3  it has values of 0  hence skip
increment"
## [1] "We are at Row 4 and column 4  it has values of 0  hence skip
increment"

x

##   V1 V2 V3 V4
## 1  0  1  1  1
## 2  3  0  1  1
## 3  4  4  0  1
## 4  5  5  5  0

checkctr= paste("Number of time the counter increased is ",ctr)
checkctr

## [1] "Number of time the counter increased is  12"

checkctr

## [1] "Number of time the counter increased is  12"

summary(x)

##           V1           V2           V3           V4
##  Min.    :0.00   Min.    :0.00   Min.    :0.00   Min.    :0.00
## 1st Qu.:2.25   1st Qu.:0.75   1st Qu.:0.75   1st Qu.:0.75
##  Median :3.50   Median :2.50   Median :1.00   Median :1.00
##  Mean   :3.00   Mean    :2.50   Mean    :1.75   Mean    :0.75
## 3rd Qu.:4.25   3rd Qu.:4.25   3rd Qu.:2.00   3rd Qu.:1.00
##  Max.   :5.00   Max.    :5.00   Max.    :5.00   Max.    :1.00

```

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