ACADGILD

SESSION 3: FOUNDATIONAL R PROGRAMMING

Assignment 1

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1. Introduction

This assignment will help you understand the concepts learnt in the session.

2. Objective

This assignment will test your skills on the basics of R.

3. Prerequisites

Not applicable.

4. Associated Data Files

Not applicable.

5. 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.

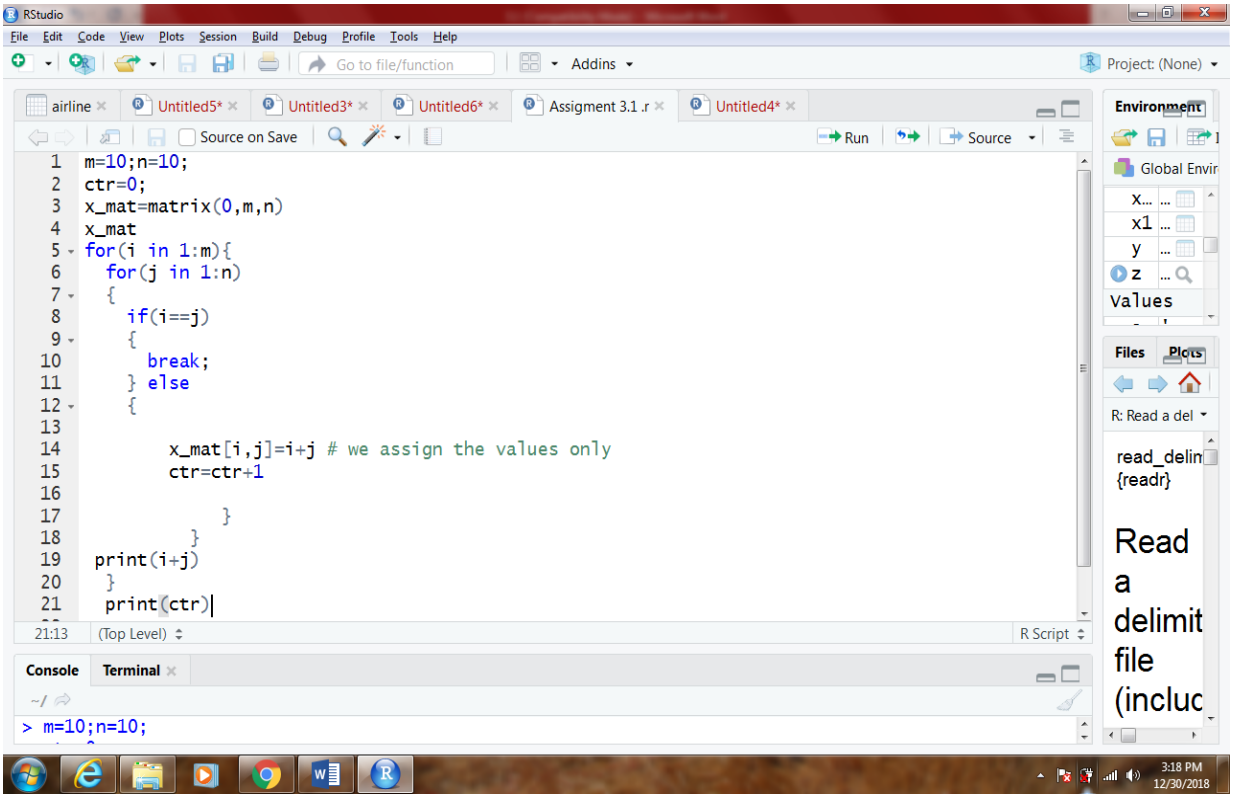
Solution:

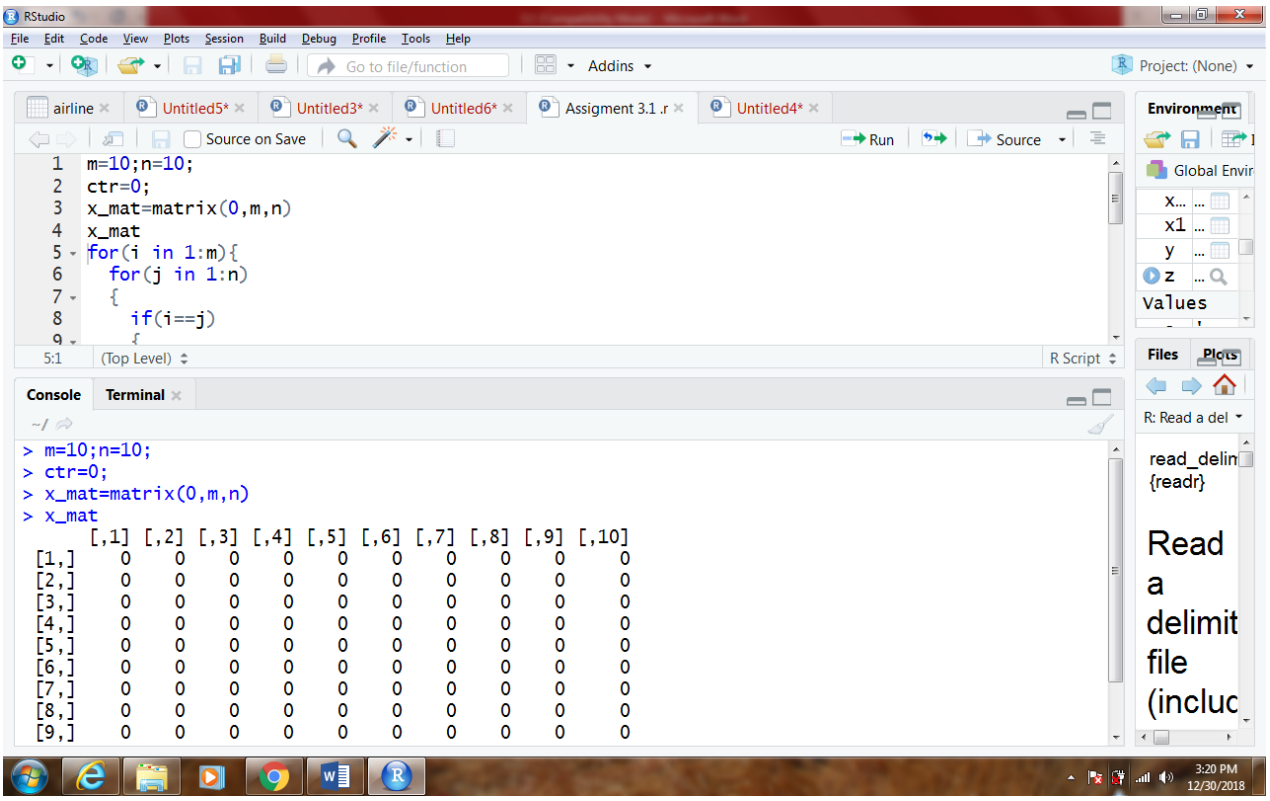
```
m=10;n=10;
ctr=0;
x_mat=matrix(0,m,n)
x_mat
for(i in 1:m){
  for(j in 1:n)
  {
    if(i==j)
    {
      break;
    } else
    {

        x_mat[i,j]=i+j # we assign the values only
        ctr=ctr+1

            }
          }
 print(i+j)
  }
  print(ctr)
x_mat
```

Solution on R-




RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Project: (None)
airline
Untitled5*
Untitled3*
Untitled6*
Assigment 3.1 .r
Untitled4*
Source on Save
Run
Source
1 m=10;n=10;
2 ctr=0;
3 x_mat=matrix(0,m,n)
4 x_mat
5 for(i in 1:m){
6 for(j in 1:n)
7 {
8 if(i==j)
9 {
5:1
(Top Level)
R Script
Console
Terminal
~/
> m=10;n=10;
> ctr=0;
> x_mat=matrix(0,m,n)
> x_mat
[,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
[1,] 0 0 0 0 0 0 0 0 0 0
[2,] 0 0 0 0 0 0 0 0 0 0
[3,] 0 0 0 0 0 0 0 0 0 0
[4,] 0 0 0 0 0 0 0 0 0 0
[5,] 0 0 0 0 0 0 0 0 0 0
[6,] 0 0 0 0 0 0 0 0 0 0
[7,] 0 0 0 0 0 0 0 0 0 0
[8,] 0 0 0 0 0 0 0 0 0 0
[9,] 0 0 0 0 0 0 0 0 0 0
Environment
Global Envir
x...
x1
y
z
Values
Files
Plots
R: Read a del
read_delin
{readr}
Read
a
delimit
file
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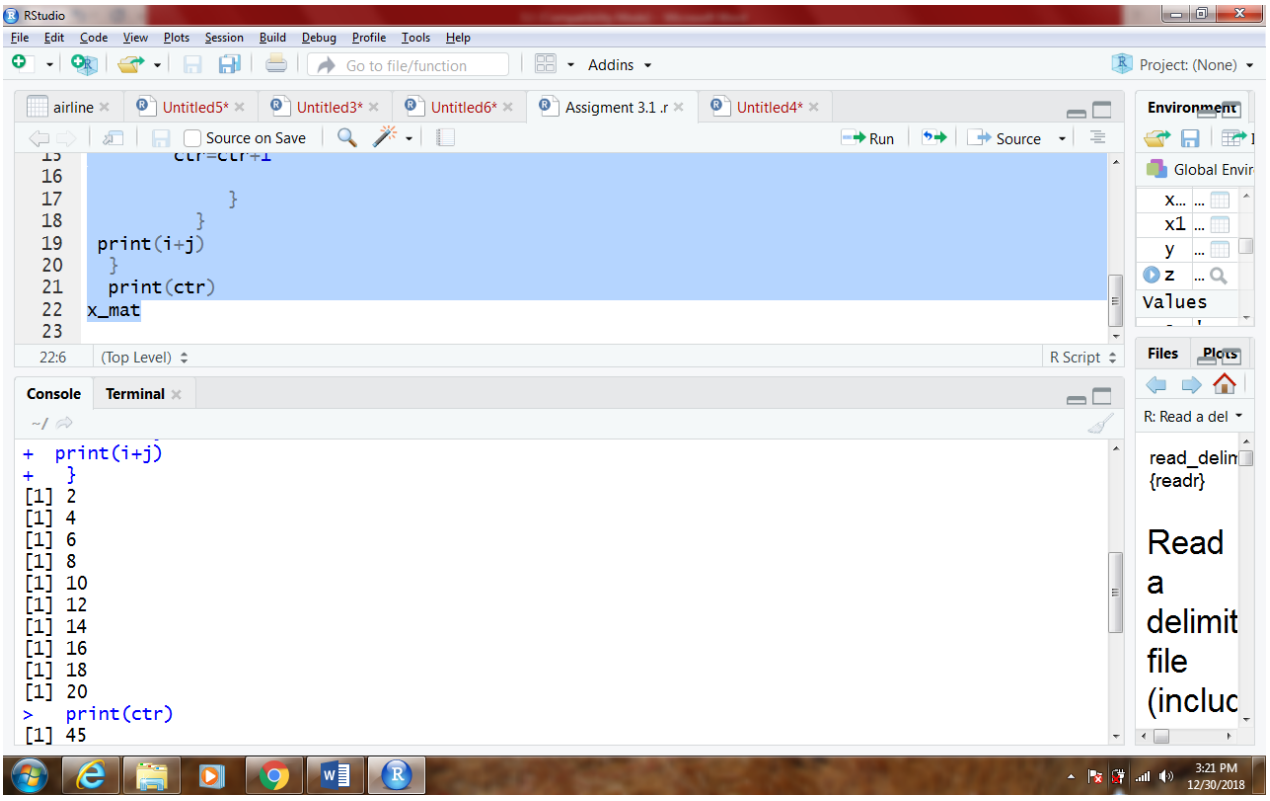
3:20 PM
12/30/2018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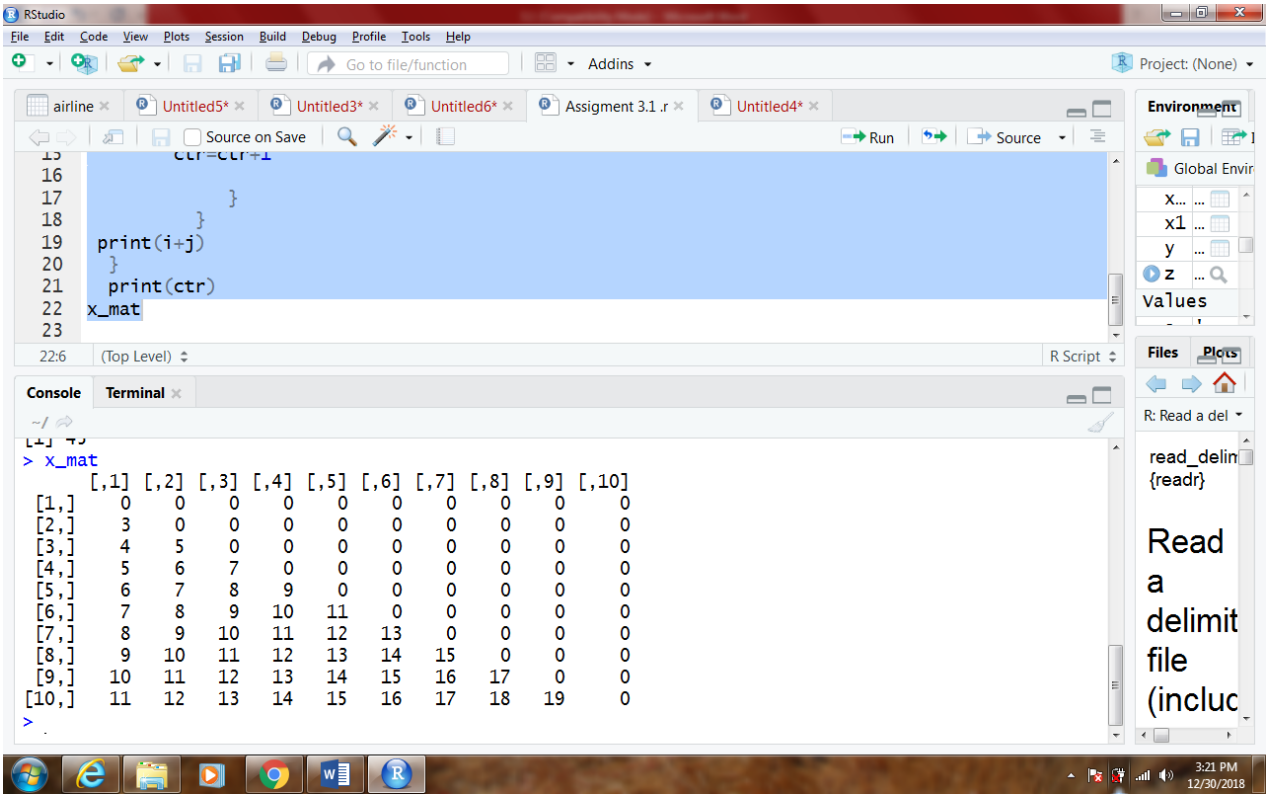
airline
Untitled5*
Untitled3*
Untitled6*
Assigment 3.1 .r
Untitled4*
Source on Save
Run
Source
ctr=ctr+1
}
}
print(i+j)
}
print(ctr)
x_mat
22:6
(Top Level)
R Script
Console
Terminal
~/
+ print(i+j)
+ }
[1] 2
[1] 4
[1] 6
[1] 8
[1] 10
[1] 12
[1] 14
[1] 16
[1] 18
[1] 20
> print(ctr)
[1] 45
Environment
Global Envir
x...
x1
y
z
Values
Files
Plots
R: Read a del
read_delin
{readr}
Read
a
delimit
file
(includ
3:21 PM
12/30/2018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Untitled5*
Untitled3*
Untitled6*
Assigment 3.1 .r
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Source on Save
Run
Source
ctr=ctr+1
}
}
print(i+j)
}
print(ctr)
x_mat
22:6
(Top Level)
R Script
Console
Terminal
> x_mat
[,1] [,2] [,3] [,4] [,5] [,6] [,7] [,8] [,9] [,10]
[1,] 0 0 0 0 0 0 0 0 0 0
[2,] 3 0 0 0 0 0 0 0 0 0
[3,] 4 5 0 0 0 0 0 0 0 0
[4,] 5 6 7 0 0 0 0 0 0 0
[5,] 6 7 8 9 0 0 0 0 0 0
[6,] 7 8 9 10 11 0 0 0 0 0
[7,] 8 9 10 11 12 13 0 0 0 0
[8,] 9 10 11 12 13 14 15 0 0 0
[9,] 10 11 12 13 14 15 16 17 0 0
[10,] 11 12 13 14 15 16 17 18 19 0
>
Environment
Global Envir
x...
x1
y
z
values
Files
Plots
R: Read a del
read_delim
{readr}
Read a delimit file (includ
3:21 PM
12/30/2018

6. Expected Format

1. R file should be submitted where applicable.
2. R file should be in PDF or in .r format
3. Proper screenshots of the outputs should be submitted as well
4. The r codes, if submitted in any other format, will be subjected to deduction in marks

Note: Your solution will not be entertained if it is any other format, e.g., .zip, .doc, .rtf etc.

7. Approximate Time to Complete Task

30 mins.