ACADGILD

SESSION 3:
FOUNDATIONAL R
PROGRAMMING

Assignment 2

Table of Contents

1. Introduction

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

2. Objective

This assignment will test your skills on Data Structures in R.

3. Prerequisites

Not applicable.

4. Associated Data Files

Not applicable.

5. Problem Statement

1. Create an m x n matrix with replicate(m, rnorm(n)) with m=10 column vectors of n=10 elements each, constructed with rnorm(n), which creates random normal numbers.

- Then we transform it into a dataframe (thus 10 observations of 10 variables) and perform an algebraic operation on each element using a nested for loop: at each iteration, every element referred by the two indexes is incremented by a sinusoidal function, compare the vectorized and non-vectorized form of creating the solution and report the system time differences.
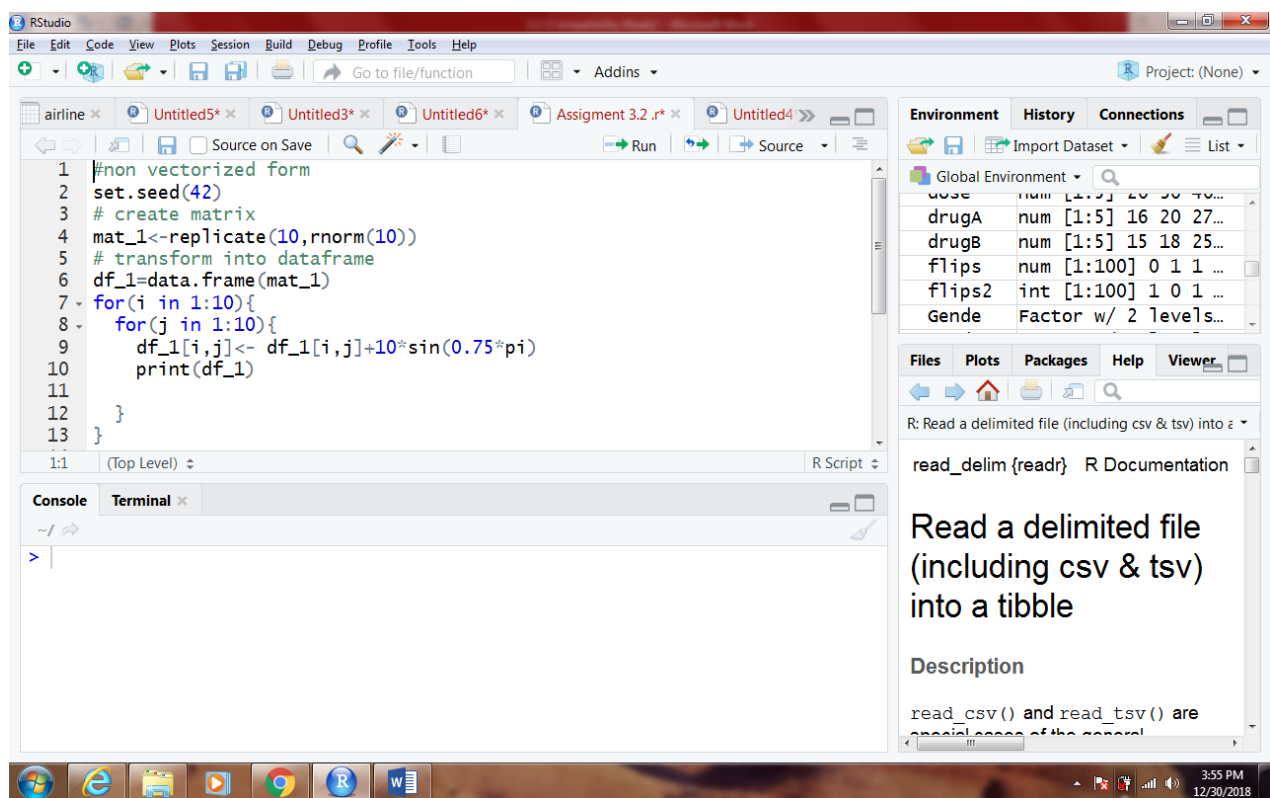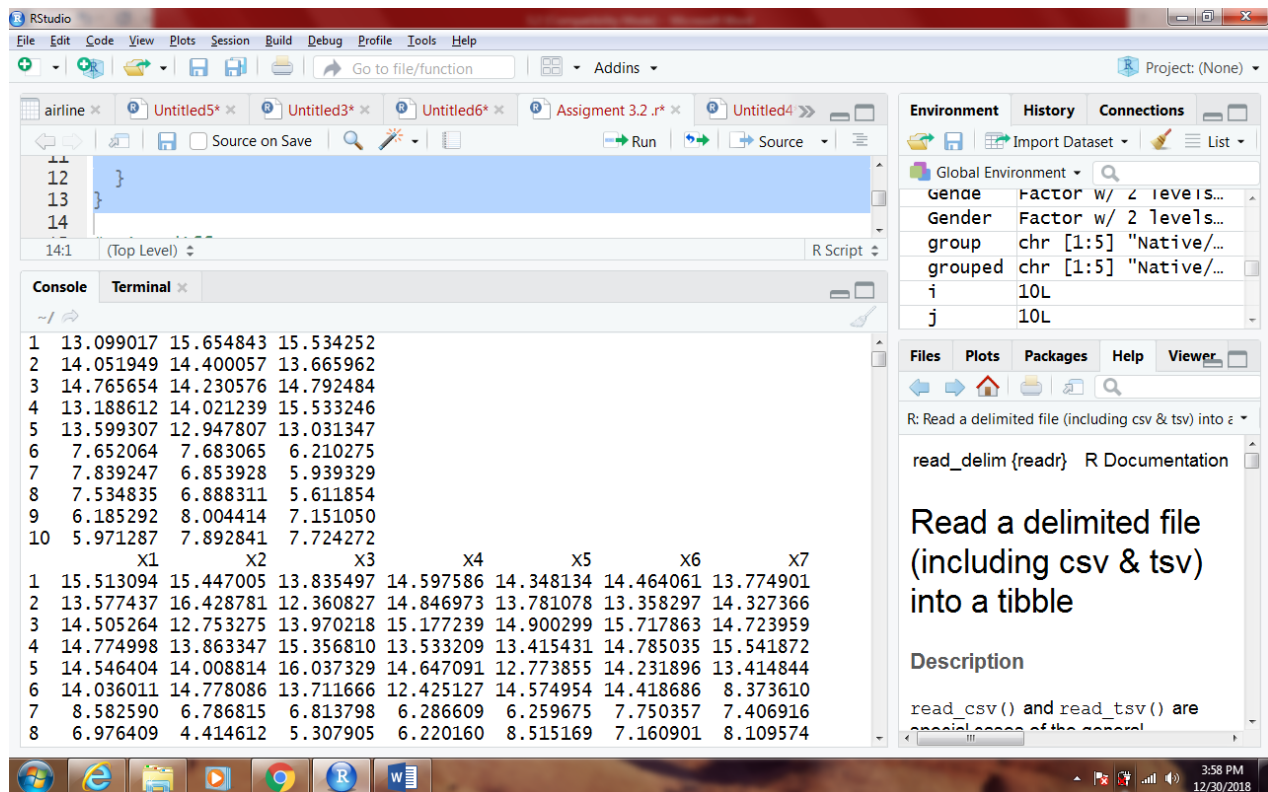
```r
#non vectorized form
set.seed(42)
# create matrix
mat_1<-replicate(10,rnorm(10))
# transform into dataframe
df_1=data.frame(mat_1)
for(i in 1:10){
  for(j in 1:10){
    df_1[i,j]<- df_1[i,j]+10*sin(0.75*pi)
    print(df_1)


  }
}
```

R screen

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Project: (None)

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Go to file/function   Addins

Source on Save   Run   Source

```
12       }
13  }
14
```
14:1   (Top Level)   R Script

Console **Terminal ×**

~/

```
1   13.099017 15.654843 15.534252
2   14.051949 14.400057 13.665962
3   14.765654 14.230576 14.792484
4   13.188612 14.021239 15.533246
5   13.599307 12.947807 13.031347
6    7.652064  7.683065  6.210275
7    7.839247  6.853928  5.939329
8    7.534835  6.888311  5.611854
9    6.185292  8.004414  7.151050
10   5.971287  7.892841  7.724272
          X1        X2        X3        X4        X5        X6        X7
1   15.513094 15.447005 13.835497 14.597586 14.348134 14.464061 13.774901
2   13.577437 16.428781 12.360827 14.846973 13.781078 13.358297 14.327366
3   14.505264 12.753275 13.970218 15.177239 14.900299 15.717863 14.723959
4   14.774998 13.863347 15.356810 13.533209 13.415431 14.785035 15.541872
5   14.546404 14.008814 16.037329 14.647091 12.773855 14.231896 13.414844
6   14.036011 14.778086 13.711666 12.425127 14.574954 14.418686  8.373610
7    8.582590  6.786815  6.813798  6.286609  6.259675  7.750357  7.406916
8    6.976409  4.414612  5.307905  6.220160  8.515169  7.160901  8.109574
```

Environment **History** **Connections**

Import Dataset   List

Global Environment

Gende	Factor w/ 2 levels...
Gender	Factor w/ 2 levels...
group	chr [1:5] "Native/...
grouped	chr [1:5] "Native/...
i	10L
j	10L

Files **Plots** **Packages** **Help** **Viewer**

R: Read a delimited file (including csv & tsv) into a

read_delim {readr}   R Documentation

Read a delimited file (including csv & tsv) into a tibble

Description

read_csv() and read_tsv() are

3:58 PM
12/30/2018

time difference
system.time(
  for(i in 1:10){
    for(j in 1:10){
      df_1[i,j]<- df_1[i,j]+10*sin(0.75*pi)
    }
  }
)

R – studio

File Edit Code View Plots Session Build Debug Profile Tools Help

Addins ▾

Project: (None) ▾

airline ×   Untitled5* ×   Untitled3* ×   Untitled6* ×   Assigment 3.2 .r* ×   Untitled4 »

Source on Save   Run   Source ▾

```
10      print(df_1)
11
12      }
13    }
14
15    # time difference
16    system.time(
17      for(i in 1:10){
18        for(j in 1:10){
19          df_1[i,j]<- df_1[i,j]+10*sin(0.75*pi)
20        }
21      }
22    )
23
```

23:1   (Top Level) ▾   R Script ▾

Environment History Connections

Import Dataset ▾   List ▾

Global Environment ▾

Gende	Factor w/ 2 levels...
Gender	Factor w/ 2 levels...
group	chr [1:5] "Native/...
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Files Plots Packages Help Viewer

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Description

`read_csv()` and `read_tsv()` are

Console Terminal ×

~/

```
+      for(j in 1:10){
+        df_1[i,j]<- df_1[i,j]+10*sin(0.75*pi)
+      }
+    }
+  )
    user  system elapsed
    0.05    0.00    0.04
>
```

3:58 PM
12/30/2018

Data Analytics

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.