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|  | Finolex Academy of Management and Technology, Ratnagiri | | | |
| **Department of Information Technology** | | | |
| **Subject:** | **R Programming Lab. (ITL804)** | | | |
| **Class:** | **BE IT / Semester – VIII (Rev-2016) / Academic year: 2019-20** | | | |
| **Name of Student:** | **Kazi Jawwad A Rahim** | | | |
| **Roll No:** | **28** | | **Date of performance (DOP) :** |  |
| **Assignment/Experiment No:** | | **02** | **Date of checking (DOC) :** |  |
| **Title:** Program to demonstrate data structures such as- vectors, matrix, list and data frames. | | | | |
| **Marks:** | |  | **Teacher’s Signature:** |  |

**1. Aim**: To understand the use of vectors, matrix, list and data frames in R.

**2. Prerequisites**:

1. Basics of R programming.

**3. Hardware Requirements**:

1. PC with minimum 2GB RAM

**4. Software Requirements:**

1. Windows / Linux OS.
2. R version 3.6 or higher

**5. Learning Objectives:**

1. To understand vectors, matrix and lists.
2. To understand *data frames* which are mainly required for data analysis in R.

**6. Learning Objectives Applicable: LO 1, LO 2**

**7. Program Outcomes Applicable: PO 1**

**8. Program Education Objectives Applicable: PEO 1, PEO 2**

**Vectors:**

> x=c(1,2,3,4,5,6)

> x

[1] 1 2 3 4 5 6

> x=1:7

> x

[1] 1 2 3 4 5 6 7

**Matrix:**

A=matrix(nrow=2,ncol=3,data=c(9,2,1,7,5,4))

print(A)

B=t(A)

print(B)

print(A%\*%B)

**OUTPUT:**

> source('G:/Practicals/R/EXP2/Second.R')

[,1] [,2] [,3]

[1,] 9 1 5

[2,] 2 7 4

[,1] [,2]

[1,] 9 2

[2,] 1 7

[3,] 5 4

[,1] [,2]

[1,] 107 45

[2,] 45 69

**List:**

a=list(3,1,"Hello",4.1,TRUE,c(3,1,5),-3+4i)

print(a[[1]])

**OUTPUT:**

> source('G:/Practicals/R/EXP2/Second.R')

[1] 3

**Data Frames:**

fr=data.frame(1:3,c("Mahesh","Ganesh","Mangesh"),c(21,22,23))

colnames(fr)=c("Roll No.","Name","Age")

print(fr)

print(rownames(fr))

**OUTPUT:**

> source('G:/Practicals/R/EXP2/Second.R')

Roll No. Name Age

1 1 Mahesh 21

2 2 Ganesh 22

3 3 Mangesh 23

[1] "1" "2" "3"

**Learning Outcomes Achieved:**

1. We understood vectors, matrix and lists.
2. We understood *data frames* which are mainly required for data analysis in R.

**Conclusion:**

We have successfully demonstrated vectors, matrix, list and data frames in R.

**13. Experiment/Assignment Evaluation**

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| **Experiment/Assignment Evaluation:** | | | | | |
| **Sr. No.** | **Parameters** | | | **Marks obtained** | **Out of** |
| **1** | Technical Understanding (Assessment may be done based on Q & A **or** any other relevant method.) Teacher should mention the other method used - | | |  | 6 |
| **2** | Neatness/presentation | | |  | 2 |
| **3** | Punctuality | | |  | 2 |
| **Date of performance (DOP)** | |  | **Total marks obtained** |  | **10** |
| **Date of checking (DOC)** | |  | **Signature of teacher** | | |

**References**:

1. URL: https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf ( Online Resources)
2. R Cookbook Paperback – 2011 by Teetor Paul O Reilly Publications
3. Beginning R: The Statistical Programming Language by Dr. Mark Gardener, Wiley Publications
4. R Programming For Dummies by Joris Meys Andrie de Vries, Wiley Publications

**Viva Questions**

1. What is vector in R ?
2. How to create matrix in R ?
3. What is difference between vector and list?
4. How is the data-frame different than matrix?
5. What is importance of data-frames in R?