



# Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem – 533437

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## **R PROGRAMMING LAB**

**(R2022057)**

## **II B.Tech II SEMESTER**

**Prepared by**

**Mr Nadella Sunil**



**Computer Lab – I**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

**Aditya College of Engineering & Technology**

Aditya Nagar, ADB Road, Surampalem - 533437



## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

KAKINADA – 533 003, Andhra Pradesh, India

### DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

II Year – II Semester		L	T	P	C
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R PROGRAMMING LAB (R2022057)					

#### COURSE OBJECTIVES:

- To learn statistical programming, computation, graphics, and modeling,
- To learn Writing functions and use R in an efficient way,
- To learn about basic types of statistical models

#### COURSE OUTCOMES:

At the end of this course, students will be able to:

- Access online resources for R and import new function packages into the Rworkspace
  - Import, review, manipulate and summarize data-sets in R
  - Explore data-sets to create testable hypotheses and identify appropriate statistical tests
  - Perform appropriate statistical tests using R
  - Create and edit visualizations with R
- 1) Write a R program to take input from the user (name and age) and display the values. Also print the version of R installation.
  - 2) Write a R program to get the details of the objects in memory.
  - 3) Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.
  - 4) Write a R program to create a simple bar plot of five subjects marks.
  - 5) Write a R program to get the unique elements of a given string and unique numbers of vector.
  - 6) Write a R program to create three vectors a,b,c with 3 integers. Combine the three vectors to become a 3x3 matrix where each column represents a vector. Print the content of the matrix.
  - 7) Write a R program to create a 5 x 4 matrix , 3 x 3 matrix with labels and fill the matrix by rows and 2 x 2 matrix with labels and fill the matrix by columns.
  - 8) Write a R program to combine three arrays so that the first row of the first array is followed by the first row of the second array and then first row of the third array.



- 9) Write a R program to create a two-dimensional 5x3 array of sequence of even integers greater than 50.
- 10) Write a R program to create an array using four given columns, three given rows, and two given tables and display the content of the array.
- 11) Write a R program to create an empty data frame.
- 12) Write a R program to create a data frame from four given vectors.
- 13) Write a R program to create a data frame using two given vectors and display the duplicated elements and unique rows of the said data frame.
- 14) Write a R program to save the information of a data frame in a file and display the information of the file.
- 15) Write a R program to create a matrix from a list of given vectors.
- 16) Write a R program to concatenate two given matrices of same column but different rows.
- 17) Write a R program to find row and column index of maximum and minimum value in a given matrix.
- 18) Write a R program to append value to a given empty vector.
- 19) Write a R program to multiply two vectors of integers type and length 3.
- 20) Write a R program to find Sum, Mean and Product of a Vector, ignore element like NA or NaN.
- 21) Write a R program to list containing a vector, a matrix and a list and give names to the elements in the list.
- 22) Write a R program to create a list containing a vector, a matrix and a list and give names to the elements in the list. Access the first and second element of the list.
- 23) Write a R program to create a list containing a vector, a matrix and a list and remove the second element.
- 24) Write a R program to select second element of a given nested list.
- 25) Write a R program to merge two given lists into one list.
- 26) Write a R program to create a list named s containing sequence of 15 capital letters, starting from 'E'.
- 27) Write a R program to assign new names "a", "b" and "c" to the elements of a given list.
- 28) Write a R program to find the levels of factor of a given vector.
- 29) Write a R program to create an ordered factor from data consisting of the names of months.
- 30) Write a R program to concatenate two given factor in a single factor.



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	ignore element like NA or NaN	
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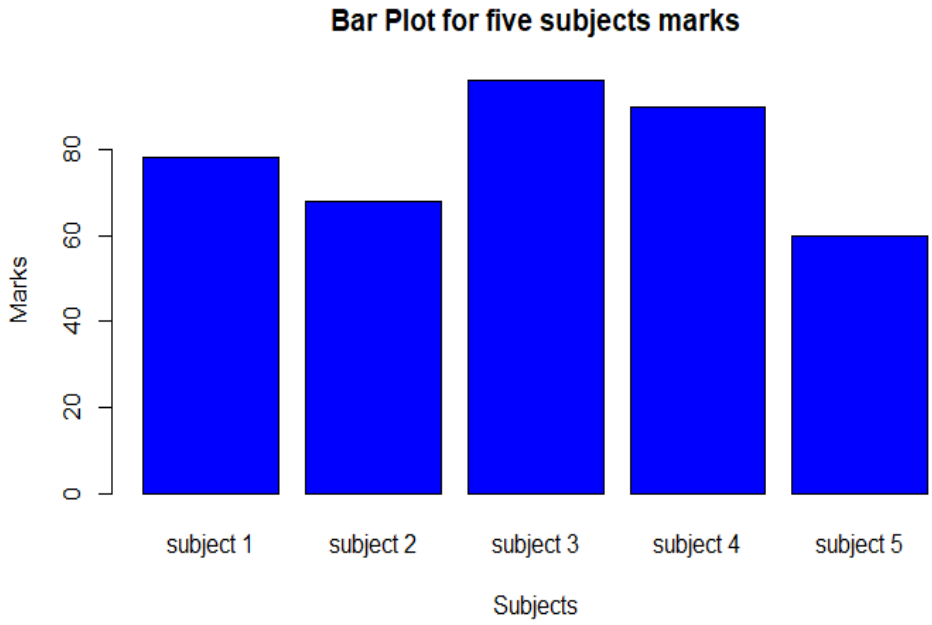
EXPERIMENT NO - 1	
<b>Experiment</b>	Write a R program to take input from the user (name and age) and display the values. Also print the version of R installation
<b>Program</b>	<pre>#reading data from user and printing name&lt;-readline(prompt = "Enter your name :: ") age&lt;-readline(prompt = "Enter your age ::") age&lt;-as.integer(age) cat("\n\your name :: ",name) cat("\n\your age ::",age) #R version details cat("\n\n=====PRINTING DETAILS OF R VERION INSTALLED =====") print(version) ver=version[['version.string']] cat("\n\n=====PRINTING ONLY R VERION INSTALLED =====") cat("\n\nPresent version installed is ",ver)</pre>
<b>Output</b>	<pre>&gt; Enter your name :: Chaitanya Enter your age ::19 your name :: Chaitanya your age :: 19 =====PRINTING DETAILS OF R VERION INSTALLED ===== platform      x86_64-w64-mingw32 arch           x86_64 os             mingw32 system         x86_64, mingw32 status major          4 minor          1.2 year           2021 month          11 day            01 svn rev        81115 language       R version.string  R version 4.1.2 (2021-11-01) nickname       Bird Hippie =====PRINTING ONLY R VERION INSTALLED ===== Present version installed is  R version 4.1.2 (2021-11-01)</pre>



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EXPERIMENT NO - 2	
<b>Experiment</b>	Write a R program to get the details of the objects in memory
<b>Program</b>	<pre>#creating objects in R x&lt;-"Sunil" y&lt;-23 z&lt;-23.6 lis&lt;-list(c(1:3)) #printing names of the objects print(ls())</pre>
<b>Output</b>	> [1] "lis" "x" "y" "z"
EXPERIMENT NO – 3	
<b>Experiment</b>	Write a R program to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91
<b>Program</b>	<pre>#creating a sequence of numbers from 20 to 50 cat("sequence of numbers from 20 to 50 :: \n",20:50) #creating a vector consists of sequence of numbers from 20 to 60 v1&lt;-c(20:60) #creating a vector consists of sequence of numbers from 51 to 91 v2&lt;-c(51:91) #finding sum of numbers from 51 to 91 cat("\nsequence of numbers from 51 to 91 :: \n",v2) cat("\nsum of numbers from 51 to 91 is :: ",sum(v2)) #finding mean of numbers from 20 to 60 cat("\nsequence of numbers from 20 to 60 :: \n",v1) cat("\nsum of numbers from 20 to 60 is :: ",sum(v1)) cat("\ntotal number of values are :: ",length(v1)) m=sum(v1)/length(v1) cat("\nmean of numbers from 20 to 60 is :: ",m)</pre>
<b>Output</b>	<pre>&gt;sequence of numbers from 20 to 50 :: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 sequence of numbers from 51 to 91 :: 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 sum of numbers from 51 to 91 is :: 2911 sequence of numbers from 20 to 60 :: 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 sum of numbers from 20 to 60 is :: 1640 total number of values are :: 41 mean of numbers from 20 to 60 is :: 40 &gt;</pre>

EXPERIMENT NO – 4													
<b>Experiment</b>	Write a R program to create a simple bar plot of five subjects marks												
<b>Program</b>	<pre>#plotting simple bar chart marks&lt;-c(78,68,96,90,60) names(marks)&lt;-c("subject 1","subject 2","subject 3","subject 4","subject 5") barplot(marks,xlab = "Subjects",ylab = "Marks",main = "Bar Plot for five subjects marks",col = "blue" )</pre>												
<b>Output</b>	 <p>Bar Plot for five subjects marks</p> <table border="1"> <thead> <tr> <th>Subject</th> <th>Marks</th> </tr> </thead> <tbody> <tr> <td>subject 1</td> <td>78</td> </tr> <tr> <td>subject 2</td> <td>68</td> </tr> <tr> <td>subject 3</td> <td>96</td> </tr> <tr> <td>subject 4</td> <td>90</td> </tr> <tr> <td>subject 5</td> <td>60</td> </tr> </tbody> </table>	Subject	Marks	subject 1	78	subject 2	68	subject 3	96	subject 4	90	subject 5	60
Subject	Marks												
subject 1	78												
subject 2	68												
subject 3	96												
subject 4	90												
subject 5	60												

EXPERIMENT NO – 5	
<b>Experiment</b>	Write a R program to get the unique elements of a given string and unique numbers of vector
<b>Program</b>	<pre>#creating vector v&lt;-c("sunil",23,12,12,34,"sunil","chaitanya","CSE","CSE",23,34,12,34,"sunil") cat("\nvector :: ",v) cat("\nunique values of the above vector are :: \n",unique(v))</pre>
<b>Output</b>	<pre>&gt; vector :: sunil 23 12 12 34 sunil chaitanya CSE CSE 23 34 12 34 sunil unique values of the above vector are :: sunil 23 12 34 chaitanya CSE &gt;</pre>





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EXPERIMENT NO - 6	
<b>Experiment</b>	Write a R program to create three vectors a,b,c with 3 integers. Combine the three vectors to become a 3×3 matrix where each column represents a vector. Print the content of the matrix
<b>Program</b>	<pre>#creating vectors a&lt;-c(12,23,34) b&lt;-c(45,56,67) c&lt;-c(78,89,90) #printing vectors cat("\nvector - 1 :: ",a) cat("\nvector - 2 :: ",b) cat("\nvector - 3 :: ",c) #creating matrix columns as vectors and printing cat("\n\nrequired matrix is :: \n") mat&lt;-matrix(c(a,b,c),nrow=3,byrow = FALSE) print(mat)</pre>
<b>Output</b>	<pre>vector - 1 :: 12 23 34 vector - 2 :: 45 56 67 vector - 3 :: 78 89 90  required matrix is ::  [,1] [,2] [,3] [1,] 12 45 78 [2,] 23 56 89 [3,] 34 67 90 &gt;</pre>



EXPERIMENT NO - 7	
<b>Experiment</b>	Write a R program to create a 5 x 4 matrix , 3 x 3 matrix with labels and fill the matrix by rows and 2 x 2 matrix with labels and fill the matrix by columns
<b>Program</b>	<pre> #creating matrix of order 5x4 with row and column name m1&lt;-matrix(c(1:20),nrow =5 ,byrow = TRUE) cat("\n\nMatrix with 5 Rows and 4 Columns without names:: \n") print(m1) rownames(m1)&lt;-c("row1","row2","row3","row4","row5") colnames(m1)&lt;-c("col1","col2","col3","col4") cat("\n\nMatrix with 5 Rows and 4 Columns with names:: \n") print(m1) #creating matrix of order 3x3 with row and column name m2&lt;-matrix(c(1:9),nrow =3 ,byrow = TRUE) cat("\n\nMatrix with 3 Rows and 3 Columns without names :: \n") print(m2) rownames(m2)&lt;-c("row1","row2","row3") colnames(m2)&lt;-c("col1","col2","col3") cat("\n\nMatrix with 3 Rows and 3 Columns with names :: \n") print(m2) #creating matrix of order 2x2 with row and column name by column major m3&lt;-matrix(c(1:4),nrow =2 ,byrow = FALSE) cat("\n\nMatrix with 2 Rows and 2 Columns without names by column major:: \n") print(m3) rownames(m3)&lt;-c("row1","row2") colnames(m3)&lt;-c("col1","col2") cat("\n\nMatrix with 2 Rows and 2 Columns with names by column major:: \n") print(m3) #creating matrix of order 2x2 with row and column name by row major m4&lt;-matrix(c(1:4),nrow =2 ,byrow = TRUE) cat("\n\nMatrix with 2 Rows and 2 Columns without names by row major:: \n") print(m4) rownames(m4)&lt;-c("row1","row2") colnames(m4)&lt;-c("col1","col2") cat("\n\nMatrix with 2 Rows and 2 Columns with names by row major:: \n") print(m4)  print("=====PRINTING ALL MATRICES=====") cat("\n MATRIX 5x4 :: \n") print(m1) cat("\n MATRIX 3x3 :: \n") </pre>



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	<pre>print(m2) cat("\n MATRIX 2x2 by column major:: \n") print(m3) cat("\n MATRIX 2x2 by row major :: \n") print(m4)</pre>
<b>Output</b>	<pre>&gt; Matrix with 5 Rows and 4 Columns without names::   [,1] [,2] [,3] [,4] [1,]  1  2  3  4 [2,]  5  6  7  8 [3,]  9 10 11 12 [4,] 13 14 15 16 [5,] 17 18 19 20  Matrix with 5 Rows and 4 Columns with names::   col1 col2 col3 col4 row1  1  2  3  4 row2  5  6  7  8 row3  9 10 11 12 row4 13 14 15 16 row5 17 18 19 20  Matrix with 3 Rows and 3 Columns without names ::   [,1] [,2] [,3] [1,]  1  2  3 [2,]  4  5  6 [3,]  7  8  9  Matrix with 3 Rows and 3 Columns with names ::   col1 col2 col3 row1  1  2  3 row2  4  5  6 row3  7  8  9  Matrix with 2 Rows and 2 Columns without names by column major::   [,1] [,2] [1,]  1  3 [2,]  2  4  Matrix with 2 Rows and 2 Columns with names by column major::   col1 col2</pre>



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	<pre> row1  1  3 row2  2  4 Matrix with 2 Rows and 2 Columns without names by row major:: [,1] [,2] [1,]  1  2 [2,]  3  4 Matrix with 2 Rows and 2 Columns with names by row major:: col1 col2 row1  1  2 row2  3  4  [1] "=====PRINTING ALL MATRICES===== MATRIX 5x4 :: col1 col2 col3 col4 row1  1  2  3  4 row2  5  6  7  8 row3  9 10 11 12 row4 13 14 15 16 row5 17 18 19 20 MATRIX 3x3 :: col1 col2 col3 row1  1  2  3 row2  4  5  6 row3  7  8  9 MATRIX 2x2 by column major:: col1 col2 row1  1  3 row2  2  4  MATRIX 2x2 by row major :: col1 col2 row1  1  2 row2  3  4 &gt; </pre>
<b>EXPERIMENT NO - 8</b>	
<b>Experiment</b>	Write a R program to combine three arrays so that the first row of the first array is followed by the first row of the second array and then first row of the third array
<b>Program</b>	<pre> num1 = rbind(rep("A",3), rep("B",3), rep("C",3)) print("num1") print(num1) num2 = rbind(rep("P",3), rep("Q",3), rep("R",3)) print("num2") </pre>



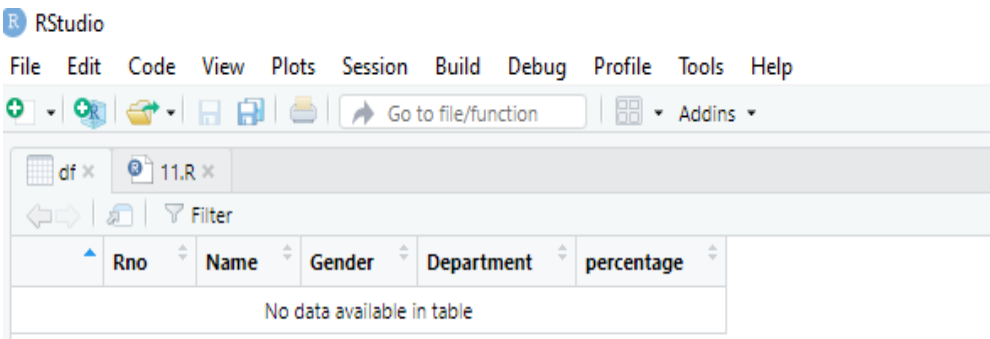
	<pre> print(num2) num3 = rbind(rep("X",3), rep("Y",3), rep("Z",3)) print("num3") print(num3) a = matrix(t(cbind(num1,num2,num3)),ncol=3, byrow=T) print("Combine three arrays, taking one row from each one by one:") print(a) </pre>
<b>Output</b>	<pre> &gt; [1] "num1"       [,1] [,2] [,3] [1,] "A"  "A"  "A" [2,] "B"  "B"  "B" [3,] "C"  "C"  "C" [1] "num2"       [,1] [,2] [,3] [1,] "P"  "P"  "P" [2,] "Q"  "Q"  "Q" [3,] "R"  "R"  "R" [1] "num3"       [,1] [,2] [,3] [1,] "X"  "X"  "X" [2,] "Y"  "Y"  "Y" [3,] "Z"  "Z"  "Z" [1] "Combine three arrays, taking one row from each one by one:"       [,1] [,2] [,3] [1,] "A"  "A"  "A" [2,] "P"  "P"  "P" [3,] "X"  "X"  "X" [4,] "B"  "B"  "B" [5,] "Q"  "Q"  "Q" [6,] "Y"  "Y"  "Y" [7,] "C"  "C"  "C" [8,] "R"  "R"  "R" [9,] "Z"  "Z"  "Z" &gt; </pre>
<b>EXPERIMENT NO - 9</b>	
<b>Experiment</b>	Write a R program to create a two-dimensional 5x3 array of sequence of even integers greater than 50
<b>Program</b>	<pre> a &lt;- array(seq(from = 50, length.out = 15, by = 2), c(5, 3)) print("Content of the array:") print("5x3 array of sequence of even integers greater than 50:") print(a) </pre>



<b>Output</b>	> [1] "Content of the array:" [1] "5×3 array of sequence of even integers greater than 50:" [,1] [,2] [,3] [1,] 50 60 70 [2,] 52 62 72 [3,] 54 64 74 [4,] 56 66 76 [5,] 58 68 78 >
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<b>EXPERIMENT NO - 10</b>	
<b>Experiment</b>	Write a R program to create an array using four given columns, three given rows, and two given tables and display the content of the array
<b>Program</b>	> array1 = array(1:30, dim=c(3,5,2)) print(array1) >
<b>Output</b>	> ,, 1  [,1] [,2] [,3] [,4] [,5] [1,] 1 4 7 10 13 [2,] 2 5 8 11 14 [3,] 3 6 9 12 15  ,, 2  [,1] [,2] [,3] [,4] [,5] [1,] 16 19 22 25 28 [2,] 17 20 23 26 29 [3,] 18 21 24 27 30  >



EXPERIMENT NO - 11	
<b>Experiment</b>	Write a R program to create an empty data frame
<b>Program</b>	<pre>#creating empty data frame df = data.frame(Rno=integer(),                 Name=character(),                 Gender=factor(),                 Department=factor(),                 percentage=double()                 )  print("Structure of the empty dataframe:") print(str(df))</pre>
<b>Output</b>	<pre>&gt; [1] "Structure of the empty dataframe:" 'data.frame': 0 obs. of 5 variables:  \$ Rno      : int  \$ Name     : chr  \$ Gender   : Factor w/ 0 levels:  \$ Department: Factor w/ 0 levels:  \$ percentage: num NULL</pre> 



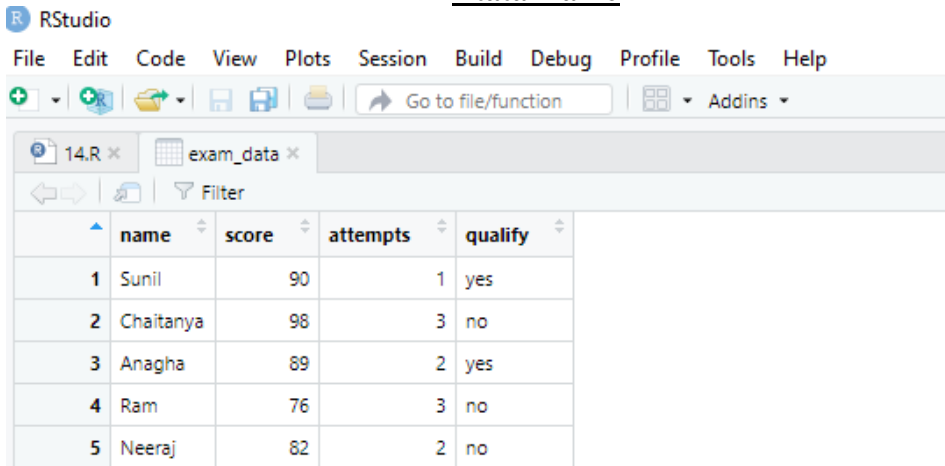




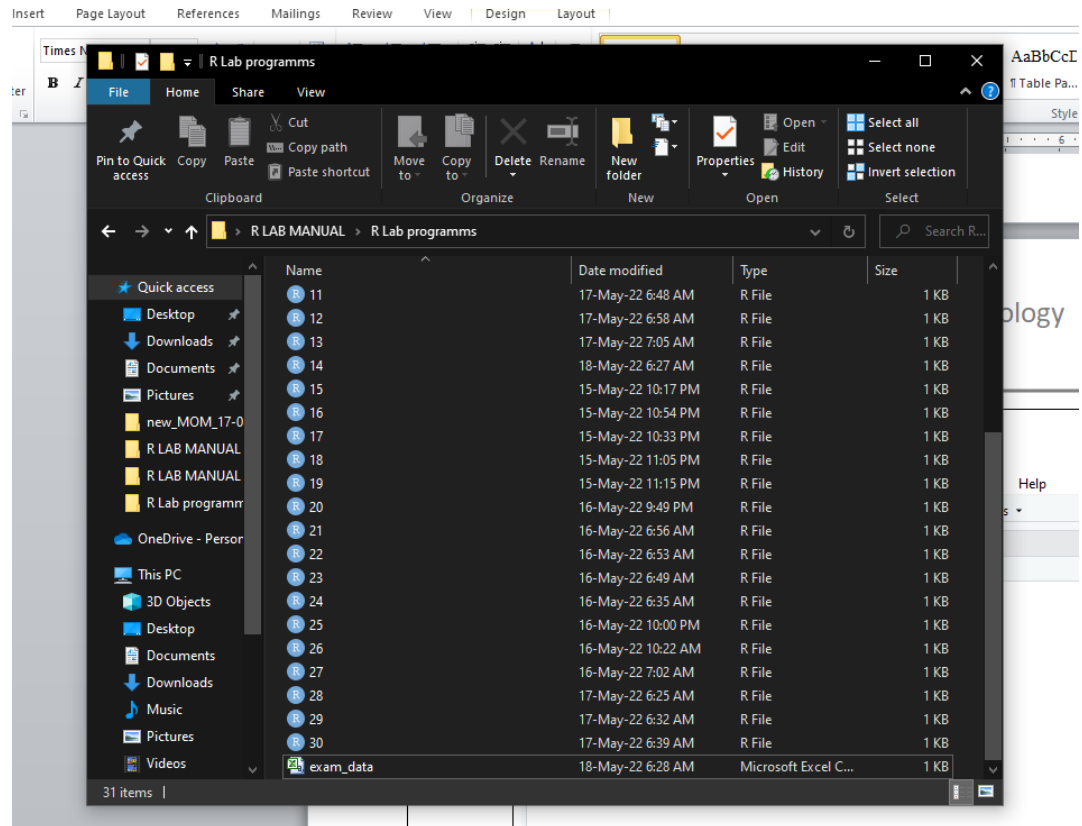
EXPERIMENT NO - 13	
<b>Experiment</b>	Write a R program to create a data frame using two given vectors and display the duplicated elements and unique rows of the said data frame
<b>Program</b>	<pre>v1 = c(10,20,10,10,40,50,20,30) v2 = c(10,30,10,20,0,50,30,30) print("Original data frame:") df = data.frame(v1,v2) print(df) print("Duplicate elements of the said data frame:") print(duplicated(df)) print("Unique rows of the said data frame:") df1&lt;-unique(df) print(df1)</pre>
<b>Output</b>	<pre>&gt; [1] "Original data frame:"   v1 v2 1 10 10 2 20 30 3 10 10 4 10 20 5 40  0 6 50 50 7 20 30 8 30 30 [1] "Duplicate elements of the said data frame:" [1] FALSE FALSE  TRUE FALSE FALSE FALSE  TRUE FALSE [1] "Unique rows of the said data frame:"   v1 v2 1 10 10 2 20 30 4 10 20 5 40  0 6 50 50 8 30 30 &gt;</pre>





EXPERIMENT NO - 14																															
Experiment	Write a R program to save the information of a data frame in a file and display the information of the file																														
Program	<pre>exam_data = data.frame(   name = c('Sunil', 'Chaitanya', 'Anagha', 'Ram', 'Neeraj'),   score = c(90,98,89,76,82),   attempts = c(1, 3, 2, 3, 2),   qualify = c('yes', 'no', 'yes', 'no', 'no') ) print("Original dataframe:") print(exam_data) save(exam_data,file="C:/Users/chaitanya/Desktop/R LAB MANUAL/R Lab programms/da.Rdata") write.csv2(exam_data,file="C:/Users/chaitanya/Desktop/R LAB MANUAL/R Lab programms/exam_data.csv") file.info("C:/Users/chaitanya/Desktop/R LAB MANUAL/R Lab programms/exam_data.csv")</pre>																														
Output	<pre>&gt; source("C:/Users/chaitanya/Desktop/R LAB MANUAL/R Lab programms/14.R") [1] "Original dataframe:"       name score attempts qualify 1  Sunil   90      1    yes 2 Chaitanya 98      3     no 3  Anagha  89      2    yes 4    Ram   76      3     no 5  Neeraj  82      2     no &gt;</pre> <div><h3><u>DtataFrame</u></h3><p>The screenshot shows the RStudio interface with the 'exam_data' dataframe loaded. The dataframe has 5 rows and 4 columns: name, score, attempts, and qualify. The data is as follows:</p><table><tr><th></th><th>name</th><th>score</th><th>attempts</th><th>qualify</th></tr><tr><td>1</td><td>Sunil</td><td>90</td><td>1</td><td>yes</td></tr><tr><td>2</td><td>Chaitanya</td><td>98</td><td>3</td><td>no</td></tr><tr><td>3</td><td>Anagha</td><td>89</td><td>2</td><td>yes</td></tr><tr><td>4</td><td>Ram</td><td>76</td><td>3</td><td>no</td></tr><tr><td>5</td><td>Neeraj</td><td>82</td><td>2</td><td>no</td></tr></table></div>		name	score	attempts	qualify	1	Sunil	90	1	yes	2	Chaitanya	98	3	no	3	Anagha	89	2	yes	4	Ram	76	3	no	5	Neeraj	82	2	no
	name	score	attempts	qualify																											
1	Sunil	90	1	yes																											
2	Chaitanya	98	3	no																											
3	Anagha	89	2	yes																											
4	Ram	76	3	no																											
5	Neeraj	82	2	no																											

## File created in Destination Folder



## Contents of the file (CSV file opened through Excel)

exam\_data - Microsoft Excel (Product Activation Failed)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	1;"name";"score";"attempts";"qualify"														
2	1;"Sunil";90;1;"yes"														
3	2;"Chaitanya";98;3;"no"														
4	3;"Anagha";89;2;"yes"														
5	4;"Ram";76;3;"no"														
6	5;"Neeraj";82;2;"no"														
7															
8															
9															
10															



EXPERIMENT NO - 15	
<b>Experiment</b>	Write a R program to create a matrix from a list of given vectors
<b>Program</b>	<pre>#creating vectors a&lt;-c(12,23,34) b&lt;-c(45,56,67) c&lt;-c(78,89,90) #printing vectors cat("\nvector - 1 :: ",a) cat("\nvector - 2 :: ",b) cat("\nvector - 3 :: ",c) lis&lt;-list(a,b,c) cat("\n list of vectors is :: \n") print(lis) #creating matrix coloumns as vectors and printing cat("\n\n required matrix is :: \n") mat&lt;-matrix(unlist(lis),nrow=3,byrow = FALSE) print(mat)</pre>
<b>Output</b>	<pre>&gt; vector - 1 :: 12 23 34 vector - 2 :: 45 56 67 vector - 3 :: 78 89 90 list of vectors is :: [[1]] [1] 12 23 34  [[2]] [1] 45 56 67  [[3]] [1] 78 89 90  required matrix is :: [,1] [,2] [,3] [1,] 12 45 78 [2,] 23 56 89 [3,] 34 67 90 &gt;</pre>



EXPERIMENT NO - 16	
<b>Experiment</b>	Write a R program to concatenate two given matrices of same column but different rows
<b>Program</b>	<pre>#creating two matrices of same columns and different rows m1&lt;-matrix(c(12,23,34,45,56,78,87,34,32,58,89,14,75,89,36),ncol = 3) m2&lt;-matrix(c("A","B","C","S","U","N"),ncol=3) #printing matrices and their dimensions cat("\n\nMatrix - 1:: \n") print(m1) cat("\n\nMatrix - 2:: \n") print(m2) cat("\n\nDimension of matrix -1 (row,col) :: ",dim(m1)) cat("\n\nDimension of matrix -2 (row,col) :: ",dim(m2)) #combining matrices m&lt;-rbind(m1,m2) #printing concatenated matrix and it's dimension cat("\n\n Resultant Matrix :: \n") print(m) cat("\n\nDimension (row,col) :: ",dim(m))</pre>
<b>Output</b>	<pre>&gt;Matrix - 1::   [,1] [,2] [,3] [1,] 12 78 89 [2,] 23 87 14 [3,] 34 34 75 [4,] 45 32 89 [5,] 56 58 36 Matrix - 2::   [,1] [,2] [,3] [1,] "A" "C" "U" [2,] "B" "S" "N" Dimension of matrix -1 (row,col) :: 5 3 Dimension of matrix -2 (row,col) :: 2 3 Resultant Matrix ::   [,1] [,2] [,3] [1,] "12" "78" "89" [2,] "23" "87" "14" [3,] "34" "34" "75" [4,] "45" "32" "89" [5,] "56" "58" "36" [6,] "A" "C" "U" [7,] "B" "S" "N" Dimension (row,col) :: 7 3</pre>



EXPERIMENT NO - 17	
<b>Experiment</b>	Write a R program to find row and column index of maximum and minimum value in agiven matrix
<b>Program</b>	<pre>#creating matrix cat("\n\n consider the  matrix :: \n") m&lt;-matrix(c(23,12,34,45,56,67,78,90,89),nrow=3,byrow = TRUE) print(m) #minimum value of the matrix mi&lt;-min(m) #maximum value of the matrix ma&lt;-max(m) cat("\n Minimum value of the matrix  :: ",mi) cat("\n Maximum value of the matrix  :: ",ma) mi_ind&lt;-which(m==mi,arr.ind = TRUE) ma_ind&lt;-which(m==ma,arr.ind = TRUE) cat("\nIndex of minimum value (row,col) :: ",mi_ind) cat("\nIndex of maximum value (row,col) :: ",ma_ind)</pre>
<b>Output</b>	<pre>&gt; consider the  matrix ::   [,1] [,2] [,3] [1,] 23 12 34 [2,] 45 56 67 [3,] 78 90 89  Minimum value of the matrix  :: 12 Maximum value of the matrix  :: 90 Index of minimum value (row,col) :: 1 2 Index of maximum value (row,col) :: 3 2 &gt;</pre>



EXPERIMENT NO - 18	
<b>Experiment</b>	Write a R program to append value to a given empty vector
<b>Program</b>	<pre>#creating empty vector v&lt;-vector() cat("\nEmpty vector      :: ",v) cat("\nlength of empty vector :: ",length(v)) #ading element v[1]="sunil" cat("\n\nStatus of vector  :: ",v) cat("\nlength of vector    :: ",length(v)) #appending elemet v&lt;-append(v,"Chaitanya",after = length(v)) cat("\n\nStatus of vector  :: ",v) cat("\nlength of vector    :: ",length(v)) v&lt;-append(v,c("CSE","B.Tech"),after = length(v)) cat("\n\nStatus of vector  :: ",v) cat("\nlength of vector    :: ",length(v))</pre>
<b>Output</b>	<pre>&gt; Empty vector      :: length of empty vector :: 0 Status of vector  :: sunil length of vector  :: 1 Status of vector  :: sunil Chaitanya length of vector  :: 2 Status of vector  :: sunil Chaitanya CSE B.Tech length of vector  :: 4 &gt;</pre>

EXPERIMENT NO - 19	
<b>Experiment</b>	Write a R program to multiply two vectors of integers type and length 3
<b>Program</b>	<pre>#creating vectors of length 3 with integers v1&lt;-c(1,2,3) v2&lt;-c(10,20,30) cat("\nVector-1 (v1):: ",v1) cat("\nVector-2 (v2):: ",v2) cat("\nmultiplication of v1 and v2 (v1 * v2):: ",v1*v2)</pre>
<b>Output</b>	<pre>&gt; Vector-1 (v1):: 1 2 3 Vector-2 (v2):: 10 20 30 multiplication of v1 and v2 (v1 * v2):: 10 40 90 &gt;</pre>





EXPERIMENT NO - 20	
<b>Experiment</b>	Write a R program to find Sum, Mean and Product of elements of a Vector, ignore element like NA or NaN
<b>Program</b>	<pre>v&lt;-c(10,23,34,NaN,NA,5,10) su=0 pr=1 count=1 for(i in v){   if(is.na(i)   is.nan(i)){     next   }else{     su=su+i     pr=pr*i     count=count+1   } } m=su/6 print("Sum, Product, Mean of a vector after neglecting both NA and NaN") cat("\nVector    :: ",v) cat("\nsum       :: ",su) cat("\nProduct    :: ",pr) cat("\nMean       :: ",m)</pre>
<b>Output</b>	<pre>&gt; [1] "Sum, Product, Mean of a vector after neglecting both NA and NaN"  Vector    :: 10 23 34 NaN NA 5 10 sum       :: 82 Product   :: 391000 Mean      :: 13.66667 &gt;</pre>



EXPERIMENT NO - 21	
<b>Experiment</b>	Write a R program to list containing a vector, a matrix and a list and give names to the elements in the list
<b>Program</b>	<pre>cat("\n List containing vector matrix and list :: \n") vect=c(1,2,3,4) matr=matrix(c(1:12),nrow = 4) lis=list(vect) #creating named list lis_final&lt;-list(ve=vect,mt=matr,li=lis) print(lis_final) print(names(lis_final))</pre>
<b>Output</b>	<pre>&gt; List containing vector matrix and list :: \$ve [1] 1 2 3 4  \$mt   [,1] [,2] [,3] [1,]  1   5   9 [2,]  2   6  10 [3,]  3   7  11 [4,]  4   8  12  \$li \$li[[1]] [1] 1 2 3 4  [1] "ve" "mt" "li" &gt;</pre>



EXPERIMENT NO - 22	
<b>Experiment</b>	Write a R program to create a list containing a vector, a matrix and a list and give names to the elements in the list. Access the first and second element of the list
<b>Program</b>	<pre>cat("\n List containing vector matrix and list :: \n") lis_final&lt;-list(v=c(1,2,3,4),m=matrix(c(1:12),nrow = 4),lis=list(v)) print(lis_final) cat("\n First element of the list :: ") print(lis_final[1]) cat("\n Second element of the list :: ") print(lis_final[2])</pre>
<b>Output</b>	<pre>&gt;  List containing vector matrix and list :: \$v [1] 1 2 3 4  \$m [,1] [,2] [,3] [1,] 1 5 9 [2,] 2 6 10 [3,] 3 7 11 [4,] 4 8 12  \$lis \$lis[[1]] [1] 1 2 3 4  First element of the list :: \$v [1] 1 2 3 4  Second element of the list :: \$m [,1] [,2] [,3] [1,] 1 5 9 [2,] 2 6 10 [3,] 3 7 11 [4,] 4 8 12  &gt;</pre>



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EXPERIMENT NO - 23	
<b>Experiment</b>	Write a R program to create a list containing a vector, a matrix and a list and remove thesecond element
<b>Program</b>	<pre>cat("\n List containing vector matrix and list :: \n") lis_final&lt;-list(v=c(1,2,3,4),m=matrix(c(1:12),nrow = 4),lis=list(v)) print(lis_final) cat("\n Removing second element in nested list :: \n") lis2&lt;-lis_final[-2] cat("\n List after removal of second element :: \n") print(lis2)</pre>
<b>Output</b>	<pre>&gt;  List containing vector matrix and list :: \$v [1] 1 2 3 4  \$m [,1] [,2] [,3] [1,] 1 5 9 [2,] 2 6 10 [3,] 3 7 11 [4,] 4 8 12  \$lis \$lis[[1]] [1] 1 2 3 4  Removing second element in nested list ::  List after removal of second element :: \$v [1] 1 2 3 4  \$lis \$lis[[1]] [1] 1 2 3 4  &gt;</pre>



EXPERIMENT NO - 24	
<b>Experiment</b>	Write a R program to select second element of a given nested list
<b>Program</b>	<pre>#creating lists lis1&lt;-list(c("sunil","chaitanya")) lis2&lt;-list(c("101","102")) lis3&lt;-list(c("CSE","CSE")) #creating nested list lis=list(lis1,lis2,lis3) #displaying lists cat("\nList-1 :: \n") print(lis1) cat("\nList-2 :: \n") print(lis2) cat("\nList-3 :: \n") print(lis3) cat("\nNested List :: \n") print(lis)      #printing second element of the nested list cat("\n Second element of Nested List :: \n") print(lis[2])</pre>
<b>Output</b>	<pre>source("C:/Users/chaitanya/Desktop/R Lab programmes/24.R") List-1 :: [[1]] [1] "sunil"  "chaitanya" List-2 :: [[1]] [1] "101" "102" List-3 :: [[1]] [1] "CSE" "CSE" Nested List :: [[1]] [[1]][[1]] [1] "sunil"  "chaitanya" [[2]] [[2]][[1]] [1] "101" "102" [[3]] [[3]][[1]] [1] "CSE" "CSE" Second element of Nested List :: [[1]] [[1]][[1]]</pre>



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	[1] "101" "102"
<b>EXPERIMENT NO - 25</b>	
<b>Experiment</b>	Write a R program to merge two given lists into one list
<b>Program</b>	<pre>#creating lists lis1&lt;-list(c(1:5)) lis2&lt;-list(c("sunil","chaitamya")) #merging lists lis3&lt;-c(lis1,lis2) lis4&lt;-append(lis2,lis1) cat("\n List-1 :: \n") print(lis1) cat("\n List-2 :: \n") print(lis2) cat("\n Combining List-1 and List-2 :: \n") print(lis3) cat("\n Combining List-2 and List-4 :: \n") print(lis4)</pre>
<b>Output</b>	<pre>&gt; List-1 :: [[1]] [1] 1 2 3 4 5  List-2 :: [[1]] [1] "sunil" "chaitamya"  Combining List-1 and List-2 :: [[1]] [1] 1 2 3 4 5  [[2]] [1] "sunil" "chaitamya"  Combining List-2 and List-4 :: [[1]] [1] "sunil" "chaitamya"  [[2]] [1] 1 2 3 4 5  &gt;</pre>



EXPERIMENT NO - 26	
<b>Experiment</b>	Write a R program to create a list named s containing sequence of 15 capital letters, starting from 'E'
<b>Program</b>	<pre>#printing sequence of Alphabets A to Z cat("Sequence of upper case alphaberts :: \n",LETTERS) print(LETTERS) s&lt;-LETTERS[seq(5,19)] cat("\n List containing 15 sequence of Alphaberts starts at E ::\n") print(s) cat("\n number of elements in above list are :: ",length(unlist(s)))</pre>
<b>Output</b>	<pre>&gt; Sequence of upper case alphaberts :: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z [1] "A" "B" "C" "D" "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S" "T" "U" [22] "V" "W" "X" "Y" "Z"  List containing 15 sequence of Alphaberts starts at E :: [1] "E" "F" "G" "H" "I" "J" "K" "L" "M" "N" "O" "P" "Q" "R" "S"  number of elements in above list are :: 15 &gt;</pre>

EXPERIMENT NO - 27	
<b>Experiment</b>	Write a R program to assign new names "a", "b" and "c" to the elements of a given list
<b>Program</b>	<pre>cat("\n List containing vector matrix and list :: \n") vect=c(1,2,3,4) matr=matrix(c(1:12),nrow = 4) lis=list(vect) #creating named list lis_final&lt;-list(ve=vect,mt=matr,li=lis) print(lis_final) print(names(lis_final)) #creating named list print("LIST WITH NEW NAMES") lis_final&lt;-list(a=vect,b=matr,c=lis) print(lis_final) print(names(lis_final))</pre>
<b>Output</b>	<pre>&gt;</pre>



	<pre>List containing vector matrix and list :: \$ve [1] 1 2 3 4  \$mt   [,1] [,2] [,3] [1,]  1  5  9 [2,]  2  6 10 [3,]  3  7 11 [4,]  4  8 12  \$li \$li[[1]] [1] 1 2 3 4  [1] "ve" "mt" "li" [1] "LIST WITH NEW NAMES" \$a [1] 1 2 3 4  \$b   [,1] [,2] [,3] [1,]  1  5  9 [2,]  2  6 10 [3,]  3  7 11 [4,]  4  8 12  \$c \$c[[1]] [1] 1 2 3 4 [1] "a" "b" "c" &gt;</pre>
--	---





EXPERIMENT NO - 28	
<b>Experiment</b>	Write a R program to find the levels of factor of a given vector
<b>Program</b>	<pre>#creating a vector x&lt;-c("CSE","sunil","IT","CSE","ACET","ACET","R","CSE") #converting it into factor f&lt;-factor(x) cat("\n factor is      :: ") print(f) cat("\n levels of the facor :: ") print(levels(f))</pre>
<b>Output</b>	<pre>&gt; factor is      :: [1] CSE  sunil IT   CSE  ACET  ACET  R    CSE Levels: ACET CSE IT R sunil  levels of the facor :: [1] "ACET" "CSE"  "IT"   "R"    "sunil" &gt;</pre>

EXPERIMENT NO - 29	
<b>Experiment</b>	Write a R program to create an ordered factor from data consisting of the names of months
<b>Program</b>	<pre>month_vector = c("March","April","January","November","January",                  "September","October","September","November","August","February",                  "January","November","November","February","May","August","February",                  "July","December","August","August","September","November","September",                  "February","April") print("Original vector ::") print(month_vector) f = factor(month_vector)  cat("\n\nOrdered factors of above vector ::\n") print(f) cat("\n\nLevels of the factor ::\n") print(levels(f)) cat("\n\ntable of Levels of the factor ::\n") print(table(f))</pre>
<b>Output</b>	<pre>&gt; [1] "Original vector ::" [1] "March"  "April"  "January" "November" "January" "September" "October" "September"</pre>



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[9] "November" "August" "February" "January" "November" "November"  
"February" "May"  
[17] "August" "February" "July" "December" "August" "August"  
"September" "November"  
[25] "September" "February" "April"

Ordered factors of above vector ::

[1] March April January November January September October  
September November

[10] August February January November November February May  
August February

[19] July December August August September November September  
February April

Levels: April August December February January July March May November  
October September

Levels of the factor ::

[1] "April" "August" "December" "February" "January" "July" "March"  
"May"

[9] "November" "October" "September"

table of Levels of the factor ::

f

	April	August	December	February	January	July	March	May
November								
October								
2	2	4	1	4	3	1	1	1
5								
1								
September								
4								

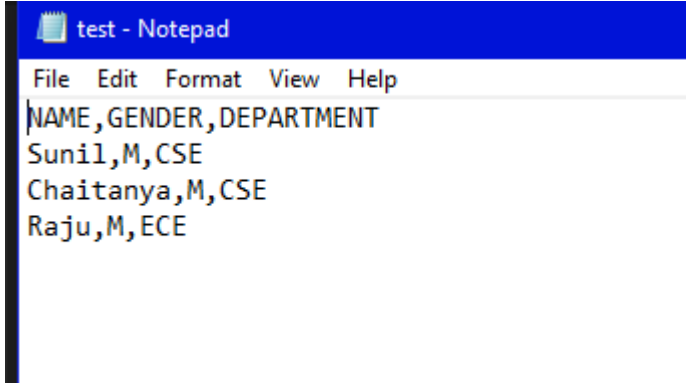
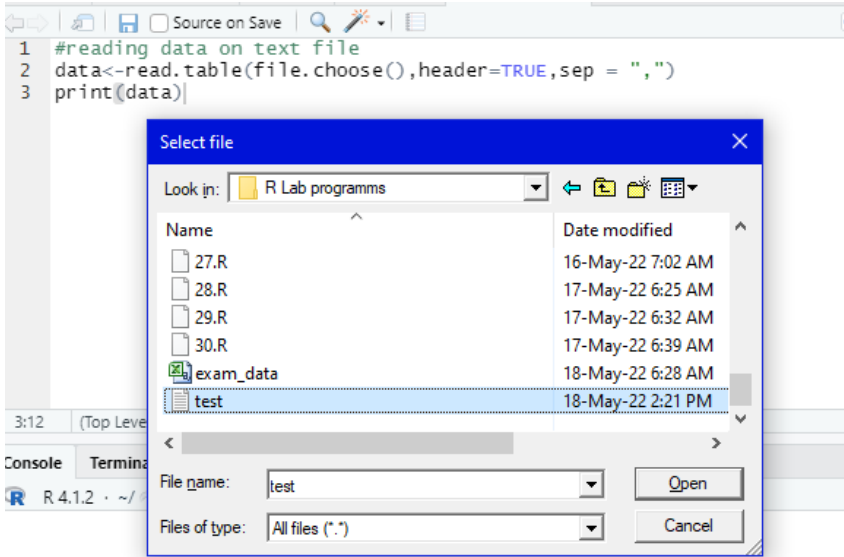
>



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EXPERIMENT NO - 30	
<b>Experiment</b>	Write a R program to concatenate two given factor in a single factor
<b>Program</b>	<pre>f1 &lt;- factor(c("sunil","chaitanya","valli","CSE","ACET")) f2 &lt;- factor(c("Python Programming","R Programming","Java Programming")) cat("\n\nOriginal factors::") cat("\n\nFactor -1 \n") print(f1) cat("\n\nFactor -2 \n") print(f2) f = factor(c(levels(f1)[f1], levels(f2)[f2])) cat("\n\nAfter concatenate factor resultant factor is :: \n") print(f)</pre>
<b>Output</b>	<pre>&gt; Original factors::  Factor -1 [1] sunil  chaitanya valli  CSE    ACET Levels: ACET chaitanya CSE sunil valli  Factor -2 [1] Python Programming R Programming  Java Programming Levels: Java Programming Python Programming R Programming After concatenate factor resultant factor is :: [1] sunil      chaitanya    valli      CSE        ACET [6] Python Programming R Programming  Java Programming Levels: ACET chaitanya CSE Java Programming Python Programming R Programming sunil valli &gt;</pre>

EXPERIMENT NO - 31	
<b>Experiment</b>	Write a R program to read data from text file
<b>Program</b>	<pre>#reading data on text file data&lt;-read.table(file.choose(),header=TRUE,sep = ",") print(data)</pre>
<b>Output</b>	<p>Create a test.txt file</p>  <p>Select test.txt</p> 



## OUTPUT

>

NAME GENDER DEPARTMENT

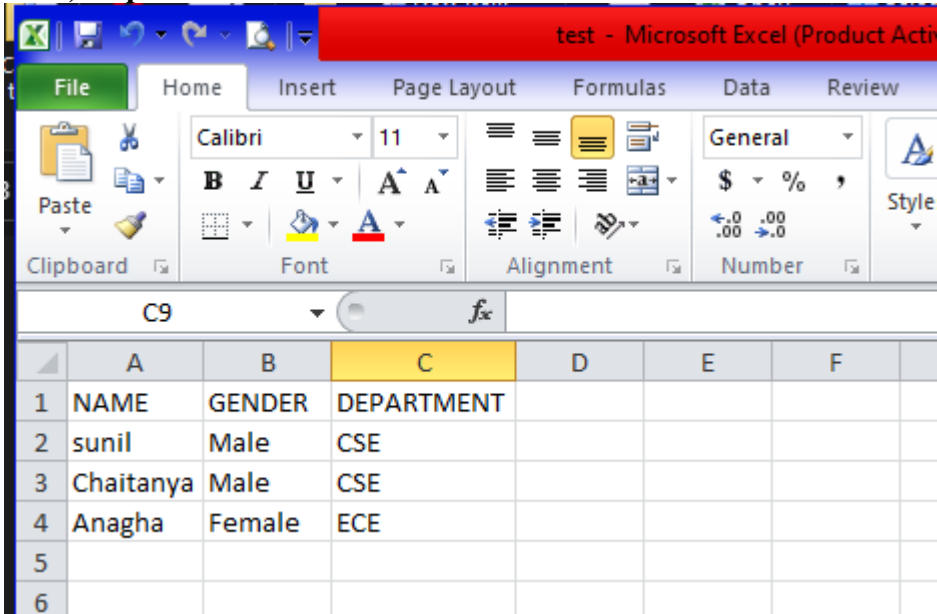
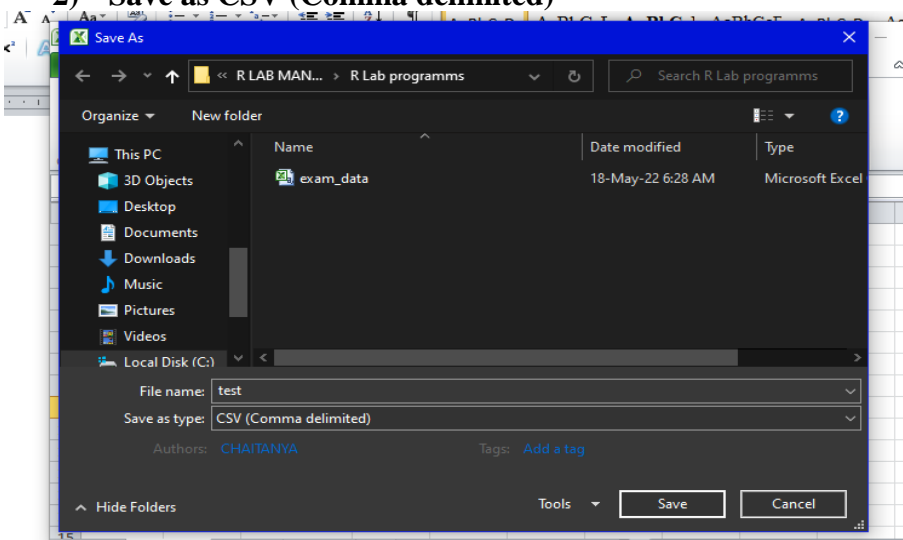
1 Sunil M CSE

2 Chaitanya M CSE

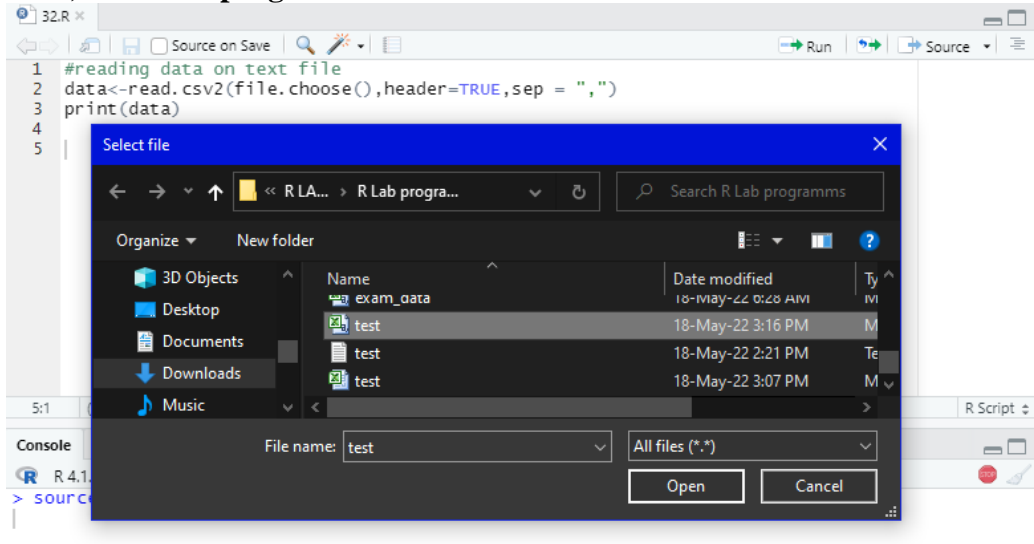
3 Raju M ECE

>

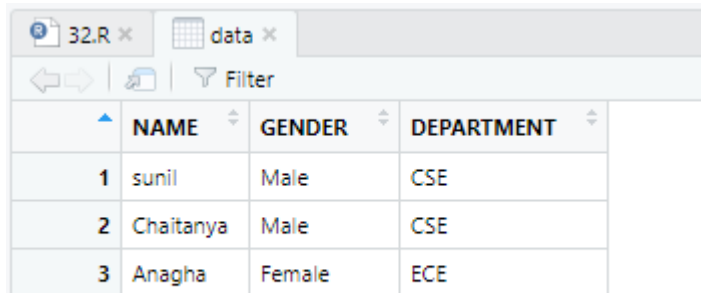
	NAME	GENDER	DEPARTMENT
1	Sunil	M	CSE
2	Chaitanya	M	CSE
3	Raju	M	ECE

EXPERIMENT NO - 32	
<b>Experiment</b>	Write a R program to read data from CSV file
<b>Program</b>	<pre>#reading data on text file data&lt;-read.csv2(file.choose(),header=TRUE,sep = ",") print(data)</pre>
<b>Output</b>	<p><b>CREATING CSV FILE</b></p> <p><b>1) Open excel file enter data</b></p>  <p><b>2) Save as CSV (Comma delimited)</b></p> 

### 3) Run the program and read above file

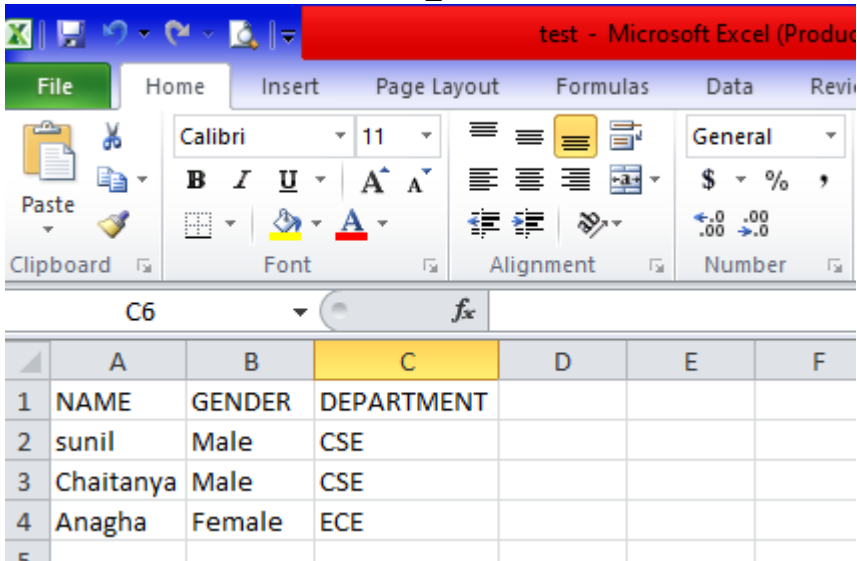
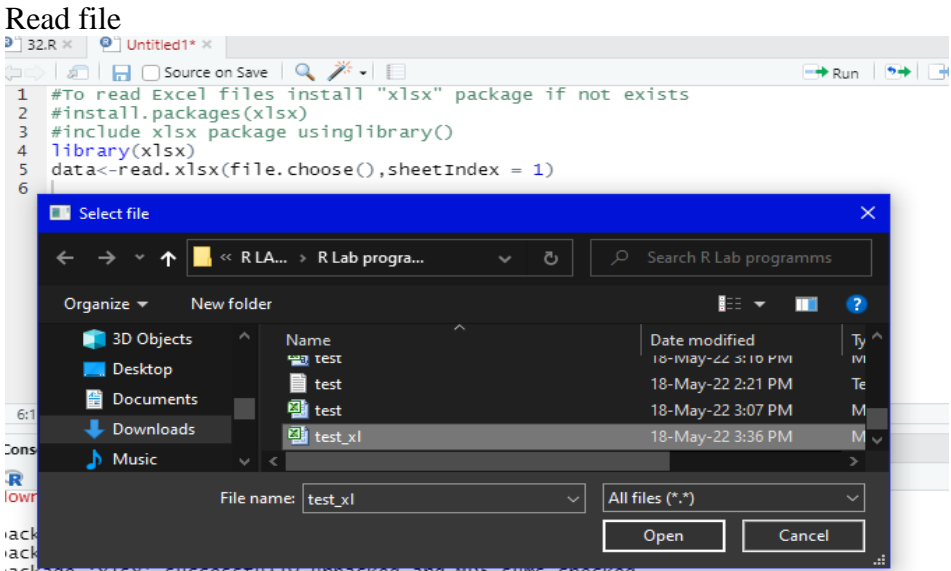


>  
NAME GENDER DEPARTMENT  
1 sunil Male CSE  
2 Chaitanya Male CSE  
3 Anagha Female ECE  
>



The screenshot shows the R Studio interface with a data table displayed. The table has four columns: NAME, GENDER, and DEPARTMENT. The data is as follows:

	NAME	GENDER	DEPARTMENT
1	sunil	Male	CSE
2	Chaitanya	Male	CSE
3	Anagha	Female	ECE

EXPERIMENT NO - 33	
<b>Experiment</b>	Write a R program to read data from Excel file
<b>Program</b>	<pre> #To read Excel files install "xlsx" package if not exists #install.packages(xlsx) #include xlsx package usinglibrary() library(xlsx) data&lt;-read.xlsx(file.choose(),sheetIndex = 1) print(data) </pre>
<b>Output</b>	<p>Create Excel file and save as test_xl.xlsx</p>  <p>Read file</p> 





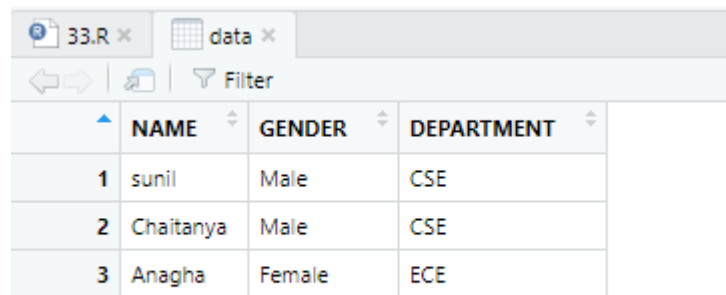
## OUTPUT

```
source("C:/Users/hi/Downloads/R LAB MANUAL/R LAB MANUAL/R Lab  
programms/33.R")
```

```
NAME GENDER DEPARTMENT
```

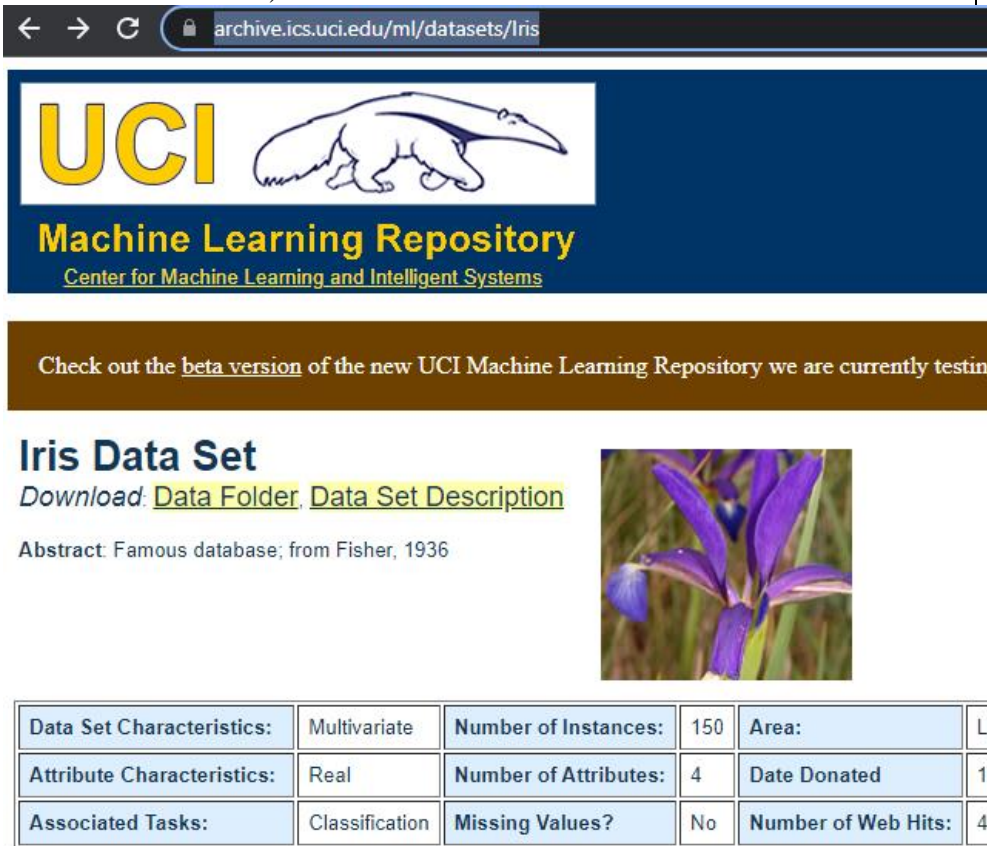
```
1 sunil Male CSE  
2 Chaitanya Male CSE  
3 Anagha Female ECE
```

```
>
```



	NAME	GENDER	DEPARTMENT
1	sunil	Male	CSE
2	Chaitanya	Male	CSE
3	Anagha	Female	ECE

EXPERIMENT NO - 34																																																																																																																																																	
Experiment	Write a R program to read data from URL																																																																																																																																																
Program	<pre>#to read a csv file syntax is #dataframe&lt;-read.csv2("url") data&lt;- read.csv2("http://gattonweb.uky.edu/sheather/book/docs/datasets/magazines.csv", header = TRUE,sep = ",") print(head(data))</pre>																																																																																																																																																
Output	<p style="text-align: center;"><b>Data stored into data frame first 6 records</b></p> <pre>&gt; &gt; source("C:/Users/chaitanya/Desktop/R LAB MANUAL/R LAB MANUAL/R Lab programmes/34.R")</pre> <table><thead><tr><th></th><th>Magazine</th><th>AdRevenue</th><th>AdPages</th><th>SubRevenue</th><th>NewsRevenue</th></tr></thead><tbody><tr><td>1</td><td>Weekly World News</td><td>2280</td><td>300</td><td>854</td><td>16568</td></tr><tr><td>2</td><td>National Examiner</td><td>3382</td><td>380</td><td>968</td><td>27215</td></tr><tr><td>3</td><td>J-14</td><td>4218</td><td>250</td><td>2206</td><td>12453</td></tr><tr><td>4</td><td>Soap Opera Weekly</td><td>4622</td><td>439</td><td>5555</td><td>24282</td></tr><tr><td>5</td><td>Easyriders</td><td>5121</td><td>523.69</td><td>4155</td><td>9929</td></tr><tr><td>6</td><td>Mary Engelbreit's Home Companion</td><td>5259</td><td>189</td><td>9048</td><td>4363</td></tr></tbody></table> <pre>&gt;</pre> <p style="text-align: center;"><b>Data frame view</b></p> <div><div>34.R × data ×</div><div>Filter</div><table><thead><tr><th></th><th>Magazine</th><th>AdRevenue</th><th>AdPages</th><th>SubRevenue</th><th>NewsRevenue</th></tr></thead><tbody><tr><td>1</td><td>Weekly World News</td><td>2280</td><td>300</td><td>854</td><td>16568</td></tr><tr><td>2</td><td>National Examiner</td><td>3382</td><td>380</td><td>968</td><td>27215</td></tr><tr><td>3</td><td>J-14</td><td>4218</td><td>250</td><td>2206</td><td>12453</td></tr><tr><td>4</td><td>Soap Opera Weekly</td><td>4622</td><td>439</td><td>5555</td><td>24282</td></tr><tr><td>5</td><td>Easyriders</td><td>5121</td><td>523.69</td><td>4155</td><td>9929</td></tr><tr><td>6</td><td>Mary Engelbreit's Home Companion</td><td>5259</td><td>189</td><td>9048</td><td>4363</td></tr><tr><td>7</td><td>Official Xbox Magazine</td><td>5838</td><td>541.66</td><td>4311</td><td>10320</td></tr><tr><td>8</td><td>Weight Watchers</td><td>6986</td><td>287.27</td><td>9202</td><td>4048</td></tr><tr><td>9</td><td>Globe</td><td>7634</td><td>380</td><td>2180</td><td>63771</td></tr><tr><td>10</td><td>PSM: 100% Independent PlayStation 2 Magazine</td><td>8034</td><td>720.11</td><td>6846</td><td>5271</td></tr><tr><td>11</td><td>PC Gamer</td><td>8154</td><td>905.68</td><td>6028</td><td>12508</td></tr><tr><td>12</td><td>Saveur</td><td>8582</td><td>306.33</td><td>9621</td><td>2299</td></tr><tr><td>13</td><td>Yankee</td><td>9353</td><td>496.09</td><td>11427</td><td>1136</td></tr><tr><td>14</td><td>Diabetes Forecast</td><td>9441</td><td>666.35</td><td>11306</td><td>519</td></tr><tr><td>15</td><td>Guns &amp; Ammo</td><td>9551</td><td>414.19</td><td>10602</td><td>2576</td></tr><tr><td>16</td><td>Fine Homebuilding</td><td>9683</td><td>521.78</td><td>7117</td><td>6307</td></tr></tbody></table></div>		Magazine	AdRevenue	AdPages	SubRevenue	NewsRevenue	1	Weekly World News	2280	300	854	16568	2	National Examiner	3382	380	968	27215	3	J-14	4218	250	2206	12453	4	Soap Opera Weekly	4622	439	5555	24282	5	Easyriders	5121	523.69	4155	9929	6	Mary Engelbreit's Home Companion	5259	189	9048	4363		Magazine	AdRevenue	AdPages	SubRevenue	NewsRevenue	1	Weekly World News	2280	300	854	16568	2	National Examiner	3382	380	968	27215	3	J-14	4218	250	2206	12453	4	Soap Opera Weekly	4622	439	5555	24282	5	Easyriders	5121	523.69	4155	9929	6	Mary Engelbreit's Home Companion	5259	189	9048	4363	7	Official Xbox Magazine	5838	541.66	4311	10320	8	Weight Watchers	6986	287.27	9202	4048	9	Globe	7634	380	2180	63771	10	PSM: 100% Independent PlayStation 2 Magazine	8034	720.11	6846	5271	11	PC Gamer	8154	905.68	6028	12508	12	Saveur	8582	306.33	9621	2299	13	Yankee	9353	496.09	11427	1136	14	Diabetes Forecast	9441	666.35	11306	519	15	Guns & Ammo	9551	414.19	10602	2576	16	Fine Homebuilding	9683	521.78	7117	6307
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EXPERIMENT NO - 35																			
Experiment	Write a R program to read Iris flower data set and give summary of the data set																		
Program	<pre>#reading data on text file data&lt;-read.table(file.choose(),header=TRUE,sep = ",") #printing head, tail and summary of the data frame print(head(data)) print(tail(data)) summary(data)</pre>																		
Output	<div>Downloading Iris Data Set</div> <div>1) Home page <a href="https://archive.ics.uci.edu/ml/index.php">https://archive.ics.uci.edu/ml/index.php</a> select Irish data</div> <div>2) Select data folder in the link</div> <div></div> <div><table><tr><td>Data Set Characteristics:</td><td>Multivariate</td><td>Number of Instances:</td><td>150</td><td>Area:</td><td>L</td></tr><tr><td>Attribute Characteristics:</td><td>Real</td><td>Number of Attributes:</td><td>4</td><td>Date Donated</td><td>1</td></tr><tr><td>Associated Tasks:</td><td>Classification</td><td>Missing Values?</td><td>No</td><td>Number of Web Hits:</td><td>4</td></tr></table></div> <div>Source:</div> <div>3) Data set available in the following link</div> <div>4) <a href="https://archive.ics.uci.edu/ml/machine-learning-databases/iris/">https://archive.ics.uci.edu/ml/machine-learning-databases/iris/</a></div>	Data Set Characteristics:	Multivariate	Number of Instances:	150	Area:	L	Attribute Characteristics:	Real	Number of Attributes:	4	Date Donated	1	Associated Tasks:	Classification	Missing Values?	No	Number of Web Hits:	4
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Attribute Characteristics:	Real	Number of Attributes:	4	Date Donated	1														
Associated Tasks:	Classification	Missing Values?	No	Number of Web Hits:	4														

5) Download the iris data text file will download

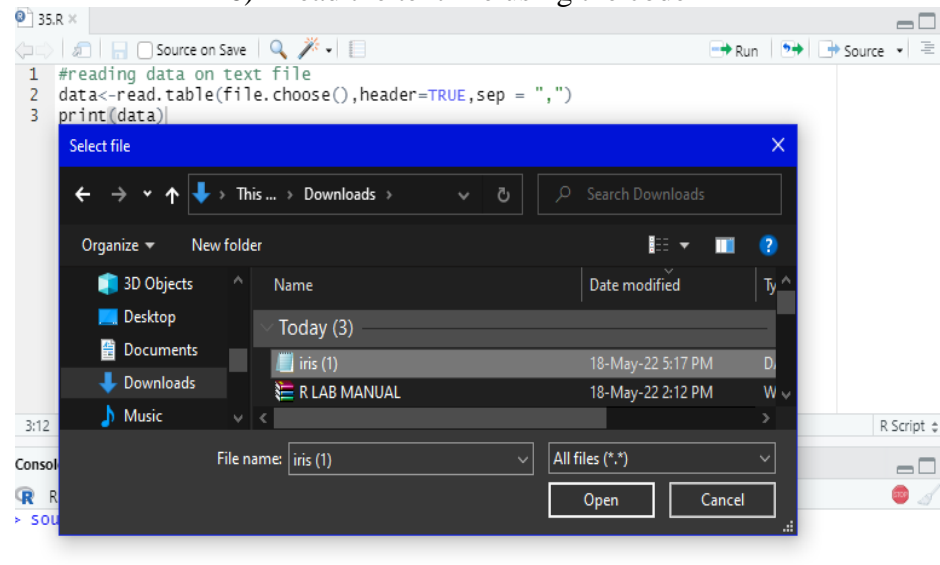
← → ↻ archive.ics.uci.edu/ml/machine-learning-databases/iris/

## Index of /ml/machine-learning-databases/iris/

- [Parent Directory](#)
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- [iris.data](#)
- [iris.names](#)

Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips SVN/1.7.14 Phusion\_Passenger/4.0.53 mod\_perl/2.0.11 Perl/v5.16.3 Server at archive.ics.uci.edu Port 443

6) Read the text file using the code

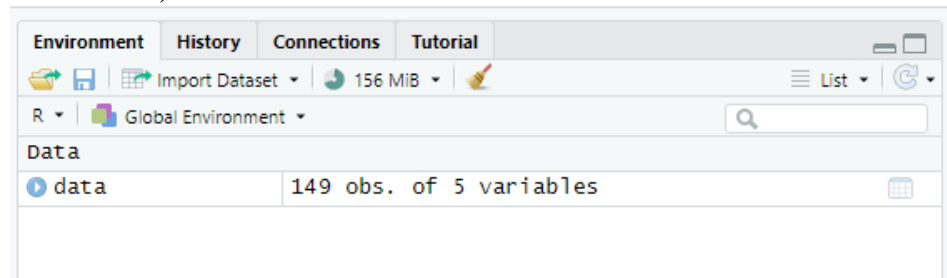


OUTPUT

```

3:12 (Top Level) R Script
Console Terminal Jobs
R 4.1.2 ~ /
> source("C:/Users/hi/Downloads/R LAB MANUAL/R LAB MANUAL/R Lab programms/35.R")
      X5.1 X3.5 X1.4 X0.2 Iris.setosa
1      4.9  3.0  1.4  0.2  Iris-setosa
2      4.7  3.2  1.3  0.2  Iris-setosa
3      4.6  3.1  1.5  0.2  Iris-setosa
4      5.0  3.6  1.4  0.2  Iris-setosa
5      5.4  3.9  1.7  0.4  Iris-setosa
6      4.6  3.4  1.4  0.3  Iris-setosa
7      5.0  3.4  1.5  0.2  Iris-setosa
8      4.4  2.9  1.4  0.2  Iris-setosa
9      4.9  3.1  1.5  0.1  Iris-setosa
10     5.4  3.7  1.5  0.2  Iris-setosa
11     4.8  3.4  1.6  0.2  Iris-setosa
12     4.8  3.0  1.4  0.1  Iris-setosa
13     4.3  3.0  1.1  0.1  Iris-setosa
14     5.8  4.0  1.2  0.2  Iris-setosa
15     5.7  4.4  1.5  0.4  Iris-setosa
16     5.4  3.9  1.3  0.4  Iris-setosa
  
```

## 7) Data frame data created with the information



## 8) Data view

	X5.1	X3.5	X1.4	X0.2	Iris.setosa
1	4.9	3.0	1.4	0.2	Iris-setosa
2	4.7	3.2	1.3	0.2	Iris-setosa
3	4.6	3.1	1.5	0.2	Iris-setosa
4	5.0	3.6	1.4	0.2	Iris-setosa
5	5.4	3.9	1.7	0.4	Iris-setosa
6	4.6	3.4	1.4	0.3	Iris-setosa
7	5.0	3.4	1.5	0.2	Iris-setosa
8	4.4	2.9	1.4	0.2	Iris-setosa
9	4.9	3.1	1.5	0.1	Iris-setosa



# Aditya College of Engineering & Technology

Aditya Nagar, ADB Road, Surampalem – 533437

## OUTPUT

```
>print(head(data))
  sepal.length sepal.width petal.length petal.width variety
1         5.1         3.5         1.4         0.2 Setosa
2         4.9         3.0         1.4         0.2 Setosa
3         4.7         3.2         1.3         0.2 Setosa
4         4.6         3.1         1.5         0.2 Setosa
5         5.0         3.6         1.4         0.2 Setosa
6         5.4         3.9         1.7         0.4 Setosa

> print(tail(data))
  sepal.length sepal.width petal.length petal.width  variety
145         6.7         3.3         5.7         2.5 Virginica
146         6.7         3.0         5.2         2.3 Virginica
147         6.3         2.5         5.0         1.9 Virginica
148         6.5         3.0         5.2         2.0 Virginica
149         6.2         3.4         5.4         2.3 Virginica
150         5.9         3.0         5.1         1.8 Virginica

> summary(data)
  sepal.length  sepal.width  petal.length  petal.width   variety
Min. :4.300  Min. :2.000  Min. :1.000  Min. :0.100  Length:150
1st Qu.:5.100 1st Qu.:2.800 1st Qu.:1.600 1st Qu.:0.300 Class :character
Median :5.800 Median :3.000 Median :4.350 Median :1.300 Mode
:character
Mean :5.843 Mean :3.057 Mean :3.758 Mean :1.199
3rd Qu.:6.400 3rd Qu.:3.300 3rd Qu.:5.100 3rd Qu.:1.800
Max. :7.900 Max. :4.400 Max. :6.900 Max. :2.500

>
```