1]write an R program to find the maximum & minimum values of a given vector.

> nums = c(10, 20, 30, 40, 50, 60)

> print('Original vector:')

[1] "Original vector:"

> print(nums)

[1] 10 20 30 40 50 60

> print(paste("Maximum value of the said vector:",max(nums)))

[1] "Maximum value of the said vector: 60"

> print(paste("Minimum value of the said vector:",min(nums)))

[1] "Minimum value of the said vector: 10"

>

2]write an R program to sort a vector in ascending & descending order.

x = c(10, 20, 30, 25, 9, 26)

> print("Original Vectors:")

[1] "Original Vectors:"

> print(x)

[1] 10 20 30 25 9 26

> print("Sort in ascending order:")

[1] "Sort in ascending order:"

> print(sort(x))

[1] 9 10 20 25 26 30

> print("Sort in descending order:")

[1] "Sort in descending order:"

> print(sort(x, decreasing=TRUE))

[1] 30 26 25 20 10 9

3]write an R program to compare two data frames to find the elements in first data frame that are not present in second data frame.

> df\_90 = data.frame(

+ "item" = c("item1", "item2", "item3"),

+ "Jan\_sale" = c(12, 14, 12),

+ "Feb\_sale" = c(11, 12, 15),

+ "Mar\_sale" = c(12, 14, 15)

+ )

> df\_91 = data.frame(

+ "item" = c("item1", "item2", "item3"),

+ "Jan\_sale" = c(12, 14, 12),

+ "Feb\_sale" = c(11, 12, 15),

+ "Mar\_sale" = c(12, 15, 18)

+ )

> print("Original Dataframes:")

[1] "Original Dataframes:"

> print(df\_90)

item Jan\_sale Feb\_sale Mar\_sale

1 item1 12 11 12

2 item2 14 12 14

3 item3 12 15 15

> print(df\_91)

item Jan\_sale Feb\_sale Mar\_sale

1 item1 12 11 12

2 item2 14 12 15

3 item3 12 15 18

> print("Row(s) in first data frame that are not present in second data frame:")

[1] "Row(s) in first data frame that are not present in second data frame:"

> print(setdiff(df\_90,df\_91))

$Mar\_sale

[1] 12 14 15

4]Write an R program to extract first 10 English letter in lower case and last 10 lettersin upper case and extract letters between 22nd to 24th letters in upper case.

> print("First 10 letters in lower case:")

[1] "First 10 letters in lower case:"

> t = head(letters, 10)

> print(t)

[1] "a" "b" "c" "d" "e" "f" "g" "h" "i" "j"

> print("Last 10 letters in upper case:")

[1] "Last 10 letters in upper case:"

> t = tail(LETTERS, 10)

> print(t)

[1] "Q" "R" "S" "T" "U" "V" "W" "X" "Y" "Z"

> print("Letters between 22nd to 24th letters in upper case:")

[1] "Letters between 22nd to 24th letters in upper case:"

> e = tail(LETTERS[22:24])

> print(e)

[1] "V" "W" "X"

5]Write an R program to find Sum, Mean and Product of a Vector.

> x = c(10, 20, 30)

> print("Sum:")

[1] "Sum:"

> print(sum(x))

[1] 60

> print("Mean:")

[1] "Mean:"

> print(mean(x))

[1] 20

> print("Product:")

[1] "Product:"

> print(prod(x))

[1] 6000

6]Write an R program to create a simple bar plot of five subject’s marks.

>marks = c(70, 95, 80, 74)

> barplot(marks,

+ main = "Comparing marks of 5 subjects",

+ xlab = "Marks",

+ ylab = "Subject",

+ names.arg = c("English", "Science", "Math.", "Hist."),

+ col = "darkred",

+ horiz = FALSE)

7]Write an R program to create a Dataframes which contain details of 5 employees anddisplay the details in ascending order.

>Employees = data.frame(Name=c("Ramesh","Umesh","Ganesh","Dinesh","Ashwini"),

+ Gender=c("M","M","M","M","F"),

+ Age=c(25,22,25,26,22),

+ Designation=c("CEO"," ASSISTANT ","Executive","Clerk"," Manager "),

+ SSN=c("123-34-2346","123-44-779","556-24-433","123-98-987","679-77-576")

+ )

> print("Details of the employees:")

[1] "Details of the employees:"

> print(Employees)

Name Gender Age Designation SSN

1 Ramesh M 25 CEO 123-34-2346

2 Umesh M 22 ASSISTANT 123-44-779

3 Ganesh M 25 Executive 556-24-433

4 Dinesh M 26 Clerk 123-98-987

5 Ashwini F 22 Manager 679-77-576

8]Write an R program to create a data frame using two given vectors and display the

duplicated elements and unique rows of the said data frame.

>a = c(10,20,10,10,40,50,20,30)

> b = c(10,30,10,20,0,50,30,30)

> print("Original data frame:")

[1] "Original data frame:"

> ab = data.frame(a,b)

> print(ab)

a b

1 10 10

2 20 30

3 10 10

4 10 20

5 40 0

6 50 50

7 20 30

8 30 30

> print("Duplicate elements of the said data frame:")

[1] "Duplicate elements of the said data frame:"

> print(duplicated(ab))

[1] FALSE FALSE TRUE FALSE FALSE FALSE TRUE FALSE

> print("Unique rows of the said data frame:")

[1] "Unique rows of the said data frame:"

> print(unique(ab))

a b

1 10 10

2 20 30

4 10 20

5 40 0

6 50 50

8 30 30

9]Write an R program to change the first level of a factor with another level of a givenfactor

> v = c("a", "b", "a", "c", "b")

> print("Original vector:")

[1] "Original vector:"

> print(v)

[1] "a" "b" "a" "c" "b"

> f = factor(v)

> print("Factor of the said vector:")

[1] "Factor of the said vector:"

> print(f)

[1] a b a c b

Levels: a b c

> levels(f)[1] = "e"

> print(f)

[1] e b e c b

Levels: e b c

11]Write a script in R to create two vectors of different lengths and give these vectors asinput to array and print addition and subtraction of those matrices.

> print("Two vectors of different lengths:")

[1] "Two vectors of different lengths:"

> v1 = c(1,3,4,5)

> v2 = c(10,11,12,13,14,15)

> print(v1)

[1] 1 3 4 5

> print(v2)

[1] 10 11 12 13 14 15

> result = array(c(v1,v2),dim = c(3,3,2))

> print("New array:")

[1] "New array:"

> print(result)

, , 1

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

[1,] 1 5 12

[2,] 3 10 13

[3,] 4 11 14

, , 2

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

[1,] 15 4 11

[2,] 1 5 12

[3,] 3 10 13

> print("The second row of the second matrix of the array:")

[1] "The second row of the second matrix of the array:"

> print(result[2,,2])

[1] 1 5 12

> print("The element in the 3rd row and 3rd column of the 1st matrix:")

[1] "The element in the 3rd row and 3rd column of the 1st matrix:"

> print(result[3,3,1])

[1] 14

12]Wriṭe an R program to calculate multiplication.

> num=as.integer(readline(prompt="enter a number:"))

enter a number:9

> for(i in 1:10)

+ {

+ print(paste(num,'x',i,'=',num\*i))

+ }

[1] "9 x 1 = 9"

[1] "9 x 2 = 18"

[1] "9 x 3 = 27"

[1] "9 x 4 = 36"

[1] "9 x 5 = 45"

[1] "9 x 6 = 54"

[1] "9 x 7 = 63"

[1] "9 x 8 = 72"

[1] "9 x 9 = 81"

[1] "9 x 10 = 90"

14]Write an R program to concatenate two given factor in a single factor and display indescending order.

> f1 <- factor(sample(LETTERS, size=6, replace=TRUE))

> f2 <- factor(sample(LETTERS, size=6, replace=TRUE))

> print("Original factors:")

[1] "Original factors:"

> print(f1)

[1] W S O J B E

Levels: B E J O S W

> print(f2)

[1] G S W M A Z

Levels: A G M S W Z

> f = factor(c(levels(f1)[f1], levels(f2)[f2]))

> print("After concatenate factor becomes:")

[1] "After concatenate factor becomes:"

> print(f)

[1] W S O J B E G S W M A Z

Levels: A B E G J M O S W Z

> print(sort(f))

[1] A B E G J M O S S W W Z

Levels: A B E G J M O S W Z

> print("Sort in descending order:")

[1] "Sort in descending order:"

> print(sort(f, decreasing=TRUE))

[1] Z W W S S O M J G E B A

Levels: A B E G J M O S W Z

15]Write an R program to extract the five of the levels of factor created from a random sample from the LETTERS.

> L = sample(LETTERS,size=50,replace=TRUE)

> print("Original data:")

[1] "Original data:"

> print(L)

[1] "Q" "D" "A" "J" "T" "J" "N" "I" "S" "L" "K" "L" "S" "J" "B" "R" "D" "V" "S"

[20] "J" "C" "O" "S" "B" "W" "H" "V" "N" "X" "U" "N" "M" "D" "M" "K" "C" "U" "Z"

[39] "F" "R" "Y" "W" "E" "G" "M" "D" "R" "W" "Q" "C"

> f = factor(L)

> print("Original factors:")

[1] "Original factors:"

> print(f)

[1] Q D A J T J N I S L K L S J B R D V S J C O S B W H V N X U N M D M K C U Z

[39] F R Y W E G M D R W Q C

Levels: A B C D E F G H I J K L M N O Q R S T U V W X Y Z

> print("Only five of the levels")

[1] "Only five of the levels"

> print(table(L[1:5]))

A D J Q T

1 1 1 1 1

>

17]write an R program to create three vectors a,b,c with three integers.Combine the three vectors to become a 3\*3 martix where each column represents a vector.To print the content of the matrix.

> a<-c(1,2,3)

> b<-c(4,5,6)

> c<-c(7,8,9)

> m<-cbind(a,b,c)

> print("content of the said matrix:")

[1] "content of the said matrix:"

> print(m)

a b c

[1,] 1 4 7

[2,] 2 5 8

[3,] 3 6 9

>

20] Write a script in R to create two vectors of different lengths and give these vectors asinput to array and print second row of second matrix of the array.

print("Two vectors of different lengths:")

[1] "Two vectors of different lengths:"

> v1 = c(1,3,4,5)

> v2 = c(10,11,12,13,14,15)

> print(v1)

[1] 1 3 4 5

> print(v2)

[1] 10 11 12 13 14 15

> result = array(c(v1,v2),dim = c(3,3,2))

> print("New array:")

[1] "New array:"

> print(result)

, , 1

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

[1,] 1 5 12

[2,] 3 10 13

[3,] 4 11 14

, , 2

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

[1,] 15 4 11

[2,] 1 5 12

[3,] 3 10 13

> print("The second row of the second matrix of the array:")

[1] "The second row of the second matrix of the array:"

> print(result[2,,2])

[1] 1 5 12

> print("The element in the 3rd row and 3rd column of the 1st matrix:")

[1] "The element in the 3rd row and 3rd column of the 1st matrix:"

> print(result[3,3,1])

[1] 14

>

22] Write an R program to print the numbers from 1 to 100 and print "SY" formultiples of 3, print "BBA" for multiples of 5, and print "SYBBA" for multiples of both.

> for (n in 1:100)

+ {

+ if (n %% 3 == 0 & n %% 5 == 0)

+ {

+ print("SY")

+ }

+ else if (n %% 3 == 0)

+ {

+ print("BBA")

+ }

+ else if (n %% 5 == 0)

+ {

+ print("SYBBA")

+ }

+ else print(n)

+ }

[1] 1

[1] 2

[1] "BBA"

[1] 4

[1] "SYBBA"

[1] "BBA"

[1] 7

[1] 8

[1] "BBA"

[1] "SYBBA"

[1] 11

[1] "BBA"

[1] 13

[1] 14

[1] "SY"

[1] 16

[1] 17

[1] "BBA"

[1] 19

[1] "SYBBA"

[1] "BBA"

[1] 22

[1] 23

[1] "BBA"

[1] "SYBBA"

[1] 26

[1] "BBA"

[1] 28

[1] 29

[1] "SY"

[1] 31

[1] 32

[1] "BBA"

[1] 34

[1] "SYBBA"

[1] "BBA"

[1] 37

[1] 38

[1] "BBA"

[1] "SYBBA"

[1] 41

[1] "BBA"

[1] 43

[1] 44

[1] "SY"

[1] 46

[1] 47

[1] "BBA"

[1] 49

[1] "SYBBA"

[1] "BBA"

[1] 52

[1] 53

[1] "BBA"

[1] "SYBBA"

[1] 56

[1] "BBA"

[1] 58

[1] 59

[1] "SY"

[1] 61

[1] 62

[1] "BBA"

[1] 64

[1] "SYBBA"

[1] "BBA"

[1] 67

[1] 68

[1] "BBA"

[1] "SYBBA"

[1] 71

[1] "BBA"

[1] 73

[1] 74

[1] "SY"

[1] 76

[1] 77

[1] "BBA"

[1] 79

[1] "SYBBA"

[1] "BBA"

[1] 82

[1] 83

[1] "BBA"

[1] "SYBBA"

[1] 86

[1] "BBA"

[1] 88

[1] 89

[1] "SY"

[1] 91

[1] 92

[1] "BBA"

[1] 94

[1] "SYBBA"

[1] "BBA"

[1] 97

[1] 98

[1] "BBA"

[1] "SYBBA"

23]Write a script in R to create two vectors of different lengths and give these vectors asinput to array and print second row of second matrix of the array.

> print("Two vectors of different lengths:")

[1] "Two vectors of different lengths:"

> v1 = c(1,3,4,5)

> v2 = c(10,11,12,13,14,15)

> print(v1)

[1] 1 3 4 5

> print(v2)

[1] 10 11 12 13 14 15

> result = array(c(v1,v2),dim = c(3,3,2))

> print("New array:")

[1] "New array:"

> print(result)

, , 1

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

[1,] 1 5 12

[2,] 3 10 13

[3,] 4 11 14

, , 2

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

[1,] 15 4 11

[2,] 1 5 12

[3,] 3 10 13

> print("The second row of the second matrix of the array:")

[1] "The second row of the second matrix of the array:"

> print(result[2,,2])

[1] 1 5 12

>

> print("The second row of the second matrix of the array:")

[1] "The second row of the second matrix of the array:"

> print(result[2,,2])

[1] 1 5 12

> print("Two vectors of different lengths:")

[1] "Two vectors of different lengths:"

> v1 = c(1,3,4,5)

> v2 = c(10,11,12,13,14,15)

> print(v1)

[1] 1 3 4 5

> print(v2)

[1] 10 11 12 13 14 15

> result = array(c(v1,v2),dim = c(3,3,2))

> print("New array:")

[1] "New array:"

> print(result)

, , 1

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

[1,] 1 5 12

[2,] 3 10 13

[3,] 4 11 14

, , 2

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

[1,] 15 4 11

[2,] 1 5 12

[3,] 3 10 13

24] Write a script in R to create two vectors of different lengths and give these vectors asinput to array and print Multiplication of those matrices.

> print("The second row of the second matrix of the array:")

[1] "The second row of the second matrix of the array:"

> print(result[2,,2])

[1] 1 5 12

> print("The element in the 3rd row and 3rd column of the 1st matrix:")

[1] "The element in the 3rd row and 3rd column of the 1st matrix:"

> print(result[3,3,1])

[1] 14

> # Creating 1st Matrix

> B = matrix(c(1, 2 + 3i, 5.4), nrow = 1, ncol = 3)

> # Creating 2nd Matrix

> C = matrix(c(2, 1i, 0.1), nrow = 1, ncol = 3)

> # Printing the resultant matrix

> print (B \* C)

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

[1,] 2+0i -3+2i 0.54+0i

25] Write an R program to create a list of elements using vectors, matrices and a

functions. Print the content of the list.

> l = list(

+ c(1, 2, 2, 5, 7, 12),

+ month.abb,

+ matrix(c(3, -8, 1, -3), nrow = 2),

+ asin

+ )

> print("Content of the list:")

[1] "Content of the list:"

> print(l)

[[1]]

[1] 1 2 2 5 7 12

[[2]]

[1] "Jan" "Feb" "Mar" "Apr" "May" "Jun" "Jul" "Aug" "Sep" "Oct" "Nov" "Dec"

[[3]]

[,1] [,2]

[1,] 3 1

[2,] -8 -3

[[4]]

function (x) .Primitive("asin")

>

26] Write a script in R to create an array, passing in a vector of values and a vector ofdimensions. Also provide names for each dimension.

> a = array( 6:30,

+ dim = c(4, 3, 2),

+ dimnames = list( c("Col1", "Col2", "Col3", "Col4"),c("Row1", "Row2", "Row3"),

+ c("Part1", "Part2"))

+ )

> print(a)

, , Part1

Row1 Row2 Row3

Col1 6 10 14

Col2 7 11 15

Col3 8 12 16

Col4 9 13 17

, , Part2

Row1 Row2 Row3

Col1 18 22 26

Col2 19 23 27

Col3 20 24 28

Col4 21 25 29

28] Write an R program to convert a given matrix to a list and print list in ascending

order

> m = matrix(1:10,nrow=2, ncol=2)

Warning message:

In matrix(1:10, nrow = 2, ncol = 2) :

data length differs from size of matrix: [10 != 2 x 2]

> print("Original matrix:")

[1] "Original matrix:"

> print(m)

[,1] [,2]

[1,] 1 3

[2,] 2 4

> l = split(m, rep(1:ncol(m), each = nrow(m)))

> print("list from the said matrix:")

[1] "list from the said matrix:"

> print(l)

$`1`

[1] 1 2

$`2`

[1] 3 4

> print(sort(m))

[1] 1 2 3 4

>

10] Write a script in R to create a list of cities and perform the following

1) Give names to the elements in the list.

2) Add an element at the end of the list.

3) Remove the last element.

4) Update the 3rd Element.

> my\_list <-list("Pune","Mumbai","Nashik")

> my\_list

[[1]]

[1] "Pune"

[[2]]

[1] "Mumbai"

[[3]]

[1] "Nashik"

> append(my\_list,"Delhi")

[[1]]

[1] "Pune"

[[2]]

[1] "Mumbai"

[[3]]

[1] "Nashik"

[[4]]

[1] "Delhi"

> print("Remove the last element of the list:")

[1] "Remove the last element of the list:"

> my\_list[-4]

[[1]]

[1] "Pune"

[[2]]

[1] "Mumbai"

[[3]]

[1] "Nashik"

> print("Upadate the third element of the list:")

[1] "Upadate the third element of the list:"

> my\_list[3]="Shirdi"

> print("New list:")

[1] "New list:"

> print(my\_list)

[[1]]

[1] "Pune"

[[2]]

[1] "Mumbai"

[[3]]

[1] "Shirdi"