**FY BCA (SCIENCE)**

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**ROLL NO: 145**

**R PROGRAMMING**

**1.Create vectors x and y of observations 4,6,2,7,1,8 and4,8respectively.Also create vectors x+y,x/y and x\*y.**

Solution :

X=c(4,6,2,7,1,8);x;

Y=c(4,8);y;

X+y;

x/y;

x\*y;

Output :

[1] 4 6 2 7 1 8

[1] 4 8

[1] 8 14 6 15 5 16

[1] 1.000 0.750 0.500 0.875 0.250 1.000

[1] 16 48 8 56 4 64

**2.Create a data frame containing state and average yield of wheat(kg) per acre using the following data**

|  |  |
| --- | --- |
| State | Yield of wheat |
| Punjab | 728 |
| Harayana | 1753 |
| U.P | 1475 |
| Gujarat | 1980 |
| Bihar | 2210 |
| Karnataka | 2270 |

**Obtain the list of state with average yield less than 1500 kg per.**

Solution:

State=c(‘Punjab’,’Haryana’,’UP’,’Gujrat’,’Bihar’,’Karnataka’);

1. Yeild\_Of\_Wheat=c(728,1753,1475,1980,2210,2270);

D=data.frame(state,Yeild\_Of\_Wheat);

D;

D2=subset (d,Yeild\_Of\_Wheat<1500);

D2;

Output:

State Yeild\_Of\_Wheat

1 Punjab 728

2 Haryana 1753

3 UP 1475

4 Gujrat 1980

5 Bihar 2210

6 Karnataka 2270

State Yeild\_Of\_Wheat

1 Punjab 728

3 UP 1475.

**3.Create a vector x of following numbers.31,26,36,14,45,28,39,51,33,34,21,11,12,35,20**

**Create a vector y containing elements numbered 3rd,7th ,8th,and 13th of vector x.Create a vector containing elements of x>25.**

Solution:

X=c(31,26,36,14,45,28,39,51,33,34,21,11,12,35,20);

Y=c(x[8:13]);

Y;

Z=c(x[x>25]);

Z;

Output:

[1] 51 33 34 21 11 12

[1] 31 26 36 45 28 39 51 33 34 35

4**.Create two vector ‘a’ and ’b’ which include marks scored by student in five subjects out of 100. Marks: marks of A: 65,89,75,95,89 B: 52,69,70,81,85 Create data frame ‘student marks ‘ with column heads as marks of A, marks of B**

Solution: Marks\_Of\_Class\_A=c(65,89,75,95,89);

Marks\_Of\_Class\_B=c(52,69,70,81,85);

D=data.frame(Marks\_Of\_Class\_A,Marks\_Of\_Class\_B);

D;

Output:

Marks\_Of\_Class\_A Marks\_Of\_Class\_B

1 65 52

2 89 69

3 75 70

4 95 81

5 89 85

**5. Create a vector a age with following Ages of 8 students :11,10,14,17,19,20,22,21 Find the number of students with age>15 and age<20.**

Solution:

x=c(11,10,14,17,19,20,22,21);

z=c(x[x>15]);

z;

age=c(11,10,14,17,19,20,22,21);

age[age<20];

age[age<20 & age>15];

output:

[1] 17 19 22 21.

[1] 11 10 14 17 19

[1] 17 19

**6. Create a matrix using R and obtain transpose of following matrix:**

Solution:

A=matrix(c(7,21,-18,24,15,15,3,9,14),byrow=T,ncol=3);

A;

R=t(A);

R;

R=t(A);

Output:

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

[1,] 7 21 -18

[2,] 24 15 15

[3,] 3 9 14

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

[1,] 7 24 3

[2,] 21 15 9

[3,] -18 15 14.

**7. Create a matrix using R and obtain product of following pairs of matrices:**

Solution:

A=matrix(c(2,4,5,9,3,8),byrow=T,ncol=2);

A;

D=matrix(c(8,6),byrow=T,ncol=1);

D;

e=A%\*%D;

e;

output:

[,1] [,2]

[1,] 2 4

[2,] 5 9

[3,] 3 8

[,1]

[1,] 8

[2,] 6

[,1]

[1,] 40

[2,] 94

[3,] 72

**8. Create a matrix using R and find the sum of the matrices A and B .**

Solution:

A=matrix(c(12,4,23,80,0,0),byrow=T,ncol=2);

A;

D=matrix(c(3,8,5,7,3,8),byrow=T,ncol=2);

D;

e=A+D;

e;

output:

[,1] [,2]

[1,] 12 4

[2,] 23 80

[3,] 0 0

[,1] [,2]

[1,] 3 8

[2,] 5 7

[3,] 3 8

[,1] [,2]

[1,] 15 12

[2,] 28 87

[3,] 3 8

**9. i) Create a matrix with the cbind () function for following data on:**

|  |  |  |
| --- | --- | --- |
| Age (in yrs.) | BMI | BP |
| 60 | 28 | 124 |
| 72 | 21 | 127 |
| 45 | 35 | 140 |

**ii) Multiply the matrix by a scalar 7.**

Solution:

age=c(60,72,45)

BMI=c(28,21,35)

BP=c(124,127,140)

A=cbind(age,BMI,BP)

A;

B=7\*A

B;

Output :

[1,] 60 28 124

[2,] 72 21 127

[3,] 45 35 140

age BMI BP

[1,] 420 196 868

[2,] 504 147 889

[3,] 315 245 980

**10.Following is the size of the 10 consecutive shirts sold in a departmental store. Find the mean size. Following is the size of the 10 consecutive shirts sold in a departmental store. Find the mean size.**

**38, 40, 36, 40, 40, 38, 42, 44, 40, 42.**

Solution :

X=c(38,40,36,40,40,38,42,44,40,42)

Y=mean(x);

X;y;

Output :

[1] 38 40 36 40 40 38 42 44 40 42

[1] 40

**11. Calculate lower quartile, median, upper quartile, 8th decile, 45th percentile and quartile deviation for the following observations: 51, 52, 53, 51, 53, 54, 54, 50, 55, 53, 55, and 56.**

Solution

:x=c(51,52,53,51,53,54,54,50,55,53, 55,56)

X;

Q1=quantile(x,0.25);

Q1;

Med=median(x);

Med;

Q3=quantile(x,0.75);

Q3;

D8=quantile(x,0.80);

D8;

P=quantile(x,0.45);

P;

QD=(q3-q1)/2;

QD

Output :

[1] 51 52 53 51 53 54 54 50 55 53 55 56

25%

51.75

[1] 53

75%

54.25

80%

54.8

45%

53

75%

1.25

**12.**.**Write a Sequence function to print a sequence of** **vector x from 1 to 25. Then find vector x’s Mean and length.**

solution

A=seq(1:25);

A;

AM=mean(A);

AM;

N=length(A);

N;

Output:

[1] 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25

[1] 13

[1] 25

**13: Write a Repetition function to print a sequence of vector x: 4,4,4,4,4,4,4,4,4,4. And write a vector y:3, 5,5,8, and 9.**

Solution

X=rep(4,10);

X;

Y=c(3,5,5,8,9);

Y;

Output :

[1] 4 4 4 4 4 4 4 4 4 4

[1] 3 5 5 8 9

**14.Create vectors x and y of observations 3,9,5,8,7,5,4,2,3 and 5,9,12,15 respectively. Also create vectors x+y,x/y and x\*y.**

solution :

X=c(3,9,5,8,7,5,4,2,3);

X;

Y=c(5,9,12,15);

Y;

X+Y;

X/Y;

X\*Y;

Output :

[1 ] 3 9 5 8 7 5 4 2 3

[1] 5 9 12 15

[1] 8 18 17 23 12 14 16 17 8

[1] 0.6000000 1.0000000 0.4166667 0.5333333 1.4000000 0.5555556 0.3333333

[8] 0.1333333 0.6000000

[1] 15 81 60 120 35 45 48 30 15

**15. Create a data frame containing state and average yield of wheat (kg) per acre using the following data.**

|  |  |
| --- | --- |
| State | Yield of wheat |
| Punjab | 728 |
| Harayana | 1753 |
| U.P | 1475 |
| Gujarat | 1980 |
| Bihar | 2210 |
| Karnataka | 2270 |

**Obtain the list of states with average yield less than 1500 kg per acre.**

solution

State=c(‘Punjab’,’Haryana’,’UP’,’Gujrat’,’Bihar’,’Karnataka’);

Yeild\_Of\_Wheat=c(728,1753,1475,1980,2210,2270);

D=data.frame(state,Yeild\_Of\_Wheat);

D;

D2=subset (d,Yeild\_Of\_Wheat<1500);

D2;

Output :

State Yeild\_Of\_Wheat

1 Punjab 728

2 Haryana 1753

3 UP 1475

4 Gujrat 1980

5 Bihar 2210

6 Karnataka 2270

State Yeild\_Of\_Wheat

1 Punjab 728

3 UP 1475

**16. Create two vectors ‘a’ and ’b’ which include marks scored by students in five subjects out of 100 marks: Marks of A: 65,89,75,95,89 Marks of B: 52,69,70,81,85 Create data frame ’student marks’ with column heads as Marks of A, Marks of B**

solution :

Marks\_Of\_Class\_A=c(65,89,75,95,89);

Marks\_Of\_Class\_B=c(52,69,70,81,85);

D=data.frame(Marks\_Of\_Class\_A,Marks\_Of\_Class\_B);

D;

Output :

Marks\_Of\_Class\_A Marks\_Of\_Class\_B

1 65 52

2 89 69

3 75 70

4 95 81

5 89 85

**17. Create a matrix using R and obtain transpose of following matrix:**

**A=9 12 18 14 15 18 13 29 13**

Solution :

A=matrix(c(9, 12, 18, 14, 15, 18, 13,29, 13),byrow=T,ncol=3);

A;

R=t(A);

R;

R=t(A);

Output :

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

[1,] 9 12 18

[2,] 14 15 18

[3,] 13 29 13

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

[1,] 9 14 13

[2,] 12 15 29

[3,] 18 18 13

**18. Create a vector x of following numbers.13,46,23,74,45,48,32,11,,13,34,21,11,17,55,20 (i) Create vector y containing elements numbered 3rd, to 9th of vector x. (ii) Create a vector z containing elements of x >25.**

Solution :

X=c(13,46,23,74,45,48,32,11,13,34,21,11,17,55,20 );

X;

Y=c(x[3:9]);

Y;

Z=c(x[x>25]);

Z;

Output :

[1] 13 46 23 74 45 48 32 11 13 34 21 11 17 55 20

[1] 23 74 45 48 32 11 13

[1] 46 74 45 48 32 34 55

**19. Following is the size of the 10 consecutive shirts sold in a departmental store. Find the mean size. 38, 22, 16, 40, 40, 38, 42, 14, 40, 24.**

Solution :

Size=c(38, 22, 16, 40, 40, 38, 42, 14, 40, 24 );

Size;

AM=mean(Size);

AM;

Output :

[1] 38 22 16 40 40 38 42 14 40 24

[1] 31.4

**20. Create a matrix using R and find the sum of the matrices A and B. A=12 4 23 8 B=3 8 5 7**

Solution :

A=matrix(c(12, 4, 23, 8),byrow=T,ncol=2);

A;

B=matrix(c(3,8,5, 7),byrow=T,ncol=2);

B;

Sum=A+B;

Sum;

Output :

[,1] [,2]

[1,] 12 4

[2,] 23 8

[,1] [,2]

[1,] 3 8

[2,] 5 7

[,1] [,2]

[1,] 15 12

[2,] 28 15

**21.i) Create a matrix with the cbind ( ) function for the following data on:**

|  |  |  |
| --- | --- | --- |
| Age (in yrs.) | BMI | BP |
| 60 | 28 | 124 |
| 72 | 21 | 127 |
| 45 | 35 | 140 |

**ii) Multiply the matrix by a scalar 7.**

Solution:

Age=c(60,72,45)

BMI=c(28,21,35)

BP=c(124,127,140)

A=cbind(age,BMI,BP)

A;

B=7\*A

B;

Output :

[1,] 60 28 124

[2,] 72 21 127

[3,] 45 35 140

Age BMI BP

[1,] 420 196 868

[2,] 504 147 889

[3,] 315 245 980

**22. Create a matrix using R and find the sum of the matrices A and B. A=12 4 23 8 B=3 8 5 7**

Solution :

A=matrix(c(12, 4, 23, 8),byrow=T,ncol=2);

A;

B=matrix(c(3,8,5, 7),byrow=T,ncol=2);

B;

Sum=A+B;

Sum;

Output :

[,1] [,2]

[1,] 12 4

[2,] 23 8

[,1] [,2]

[1,] 3 8

[2,] 5 7

[,1] [,2]

[1,] 15 12

[2,] 28 15

**23.Create a data frame containing supply and demand per acre using the following data**.

|  |  |
| --- | --- |
| supply | demand |
| 120 | 90 |
| 140 | 150 |
| 210 | 200 |
| 100 | 80 |
| 90 | 60 |

**Obtain the list of supply with demand less than 160.**

Solution :

Supply=c(120,140,210,100,90);

Demand=c(90,150,200,80,60);

D=data.frame(Supply,Demand);

D;

D2=subset (d,Demand<160);

D2;

Output :

Supply Demand

1 120 90

2 140 150

3 210 200

4 100 80

5 90 60

Supply Demand

1 120 90

2 140 150

4 100 80

5 90 60

**24.Create a vector age with following ages of 8 students:11,10,14,17,19,20,22,21 i) Find the number of students with age>19.**

Solution :

Age\_of\_student=c(11,10,14,17,19,20,22,21);

Age\_of\_student;

D2=subset (Age\_of\_student ,Age\_of\_student>19);

D2;

Output :

[1] 11 10 14 17 19 20 22 21

[1] 20 22 21

**25.Create two vector ‘a’ and ’b’ which include marks scored by student in five subjects out of 100. Marks: marks of A: 65,89,75,95,89 B: 52,69,70,81,85 Create data frame ‘student marks ‘ with column heads as marks of A, marks of B**

Solution: Marks\_Of\_Class\_A=c(65,89,75,95,89);

Marks\_Of\_Class\_B=c(52,69,70,81,85);

D=data.frame(Marks\_Of\_Class\_A,Marks\_Of\_Class\_B);

D;

Output:

Marks\_Of\_Class\_A Marks\_Of\_Class\_B

1 65 52

2 89 69

3 75 70

4 95 81

5 89 85

**26. Create a matrix using R and find the sum of the matrices A and B. A=12 4 23 8 B=3 8 5 7**

Solution :

A=matrix(c(12, 4, 23, 8),byrow=T,ncol=2);

A;

B=matrix(c(3,8,5, 7),byrow=T,ncol=2);

B;

Sum=A+B;

Sum;

Output :

[,1] [,2]

[1,] 12 4

[2,] 23 8

[,1] [,2]

[1,] 3 8

[2,] 5 7

[,1] [,2]

[1,] 15 12

[2,] 28 15

**27.** **Calculate lower quartile, median, upper quartile, 8th decile, 45th percentile and quartile deviation for the following observations: 51, 52, 53, 51, 53, 54, 54, 50, 55, 53, 55, and 56.**

Solution :

X=c(51,52,53,51,53,54,54,50,55,53, 55,56)

X;

Q1=quantile(x,0.25);

Q1;

Med=median(x);

Med;

Q3=quantile(x,0.75);

Q3;

D8=quantile(x,0.80);

D8;

P=quantile(x,0.45);

P;

QD=(q3-q1)/2;

QD;

Output :

[1] 51 52 53 51 53 54 54 50 55 53 55 56

25%

51.75

[1] 53

75%

54.25

80%

54.8

45%

53

75%

1.25

**28.Write a Repetition function to print a sequence of vector x: 4,4,4,4,4,4,4,4,4,4. And write a vector y:3, 5,5,8, and 9.**

Solution

X=rep(4,10);

X;

Y=c(3,5,5,8,9);

Y;

Output :

[1] 4 4 4 4 4 4 4 4 4 4

[1] 3 5 5 8 9

**29.Write a Repetition function to print a sequence of vector x: 4,4,4,4,4,4,4,4,4,4. And write a vector y:3, 5,5,8, and 9.**

**Solution :**

**Refer to Q 28**

**30.** **Create vectors x and y of observations 3,9,5,8,7,5,4,2,3 and 5,9,12,15 respectively. Also create vectors x+y,x/y and x\*y.**

solution :

X=c(3,9,5,8,7,5,4,2,3);

X;

Y=c(5,9,12,15);

Y;

X+Y;

X/Y;

X\*Y;