**MODULE 6 ASSIGNMENT**

This is an explanation about performing Mathematics and simulations in relation to Matrices in R.

Two matrices ‘A and B’ are created to work with using the following code and ‘A;B’ is implemented to print the matrices.

> A=matrix(c(2,0,1,3), ncol=2)

> B=matrix(c(5,2,4,-1), ncol=2)

> A;B

[,1] [,2]

[1,] 2 1

[2,] 0 3

[,1] [,2]

[1,] 5 4

[2,] 2 -1

These two matrices (A & B) can be added using the following code and resultant is given as ‘C’. Same code can be used to add ‘n’ number of matrices.

> C<- A+B

> C

[,1] [,2]

[1,] 7 5

[2,] 2 2

Two matrices ‘A & B’ are subtracted using the following code and the resultant is printed as ‘D’. Same code can be implemented to subtract ‘n’ number of matrices.

> D<- A-B

> D

[,1] [,2]

[1,] -3 -3

[2,] -2 4

Function ‘diag()’ can be used to build a matrix with the values in the diagonal.

In the following, matrix of 4\*4 is obtained using the same function with values ‘4,1,2,3’ and it is printed as ‘E’.

> E<- diag(c(4,1,2,3))

> E

[,1] [,2] [,3] [,4]

[1,] 4 0 0 0

[2,] 0 1 0 0

[3,] 0 0 2 0

[4,] 0 0 0 3

Using the same function ‘diag()’,matrix with five 3’s can be obtained in the diagonal and this is then printed as ‘G’.

> G<-diag(c(3,3,3,3,3))

> G

[,1] [,2] [,3] [,4] [,5]

[1,] 3 0 0 0 0

[2,] 0 3 0 0 0

[3,] 0 0 3 0 0

[4,] 0 0 0 3 0

[5,] 0 0 0 0 3

Matrix ‘H’ is generated with four 1’s in 2nd,3rd, 4th,5th columns of the first row.

> H<- matrix(c(0,1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0),nrow = 5, ncol = 5, byrow = TRUE)

> H

[,1] [,2] [,3] [,4] [,5]

[1,] 0 1 1 1 1

[2,] 0 0 0 0 0

[3,] 0 0 0 0 0

[4,] 0 0 0 0 0

[5,] 0 0 0 0 0

Matrix ‘I’ is generated with four 2’s in the 2nd,3rd, 4th,5th rows of the first column.

> I <- matrix(c(0,0,0,0,0,2,0,0,0,0,2,0,0,0,0,2,0,0,0,0,2,0,0,0,0), nrow = 5, ncol = 5, byrow = TRUE)

> I

[,1] [,2] [,3] [,4] [,5]

[1,] 0 0 0 0 0

[2,] 2 0 0 0 0

[3,] 2 0 0 0 0

[4,] 2 0 0 0 0

[5,] 2 0 0 0 0

All the three matrices ‘G+H+I’ are added to obtain matrix ‘matfinal’ using the following code and printed as ‘matfinal’.

> matfinal<-G+H+I

> matfinal

[,1] [,2] [,3] [,4] [,5]

[1,] 3 1 1 1 1

[2,] 2 3 0 0 0

[3,] 2 0 3 0 0

[4,] 2 0 0 3 0

[5,] 2 0 0 0 3

In this way, addition, subtraction of matrices and matrices with digits in the diagonal can be obtained when these codes are implemented.

Graphical user interface, text, application

Description automatically generated