1. **Write and execute a c program to read a matrix and perform row\_sum, column\_sum and sum of all elements of a given matrix and display the result.**

#include <stdio.h>

void main()

{

int i, j, m, n;

int matrix[10][20];

int sumR, sumC,sum=0;

printf("Enter number of rows : ");

scanf("%d", &m);

printf("Enter number of columns : ");

scanf("%d", &n);

/\* Input data in matrix \*/

for (i = 0; i < m; i++)

{

for (j = 0; j < n; j++)

{

printf("Enter data in [%d][%d]: ", i, j);

scanf("%d", &matrix[i][j]);

}

}

printf("\n");

/\* Display the matrix \*/

for (i = 0; i < m; i++)

{

for (j = 0; j < n; j++)

{

printf("%d\t", matrix[i][j]);

}

printf("\n");

}

printf("\n");

/\* Find the row-wise sum of matrix \*/

for (i = 0; i < m; i++)

{

sumR = 0;

for (j = 0; j < n; j++)

{

sumR += matrix[i][j];

}

printf("Sum of row %d = %d\n", i + 1, sumR);

}

printf("\n");

/\* Find the column-wise sum of matrix \*/

for (i = 0; i < n; i++)

{

sumC = 0;

for (j = 0; j < m; j++)

{

sumC += matrix[j][i];

}

printf("Sum of column %d = %d\n", i + 1, sumC);

}

sum=0;

for (i = 0; i < m; i++)

{

for (j = 0; j < n; j++)

{

sum+= matrix[i][j];

}

}

printf("Sum of all elements in a matrix %d\n", sum);

}

1. **Write and execute a c program to read marks scored by 5 students in three subjects into a two dimensional array using keyboard, Find the highest marks scored in each subject and display the result.**

#include <stdio.h>

void main()

{

int marks[5][3],maxMark[4],r, c;

//input

for(r = 0; r < 5; r++)

{

printf("Enter marks of 3 tests of Student #%d: ", (r + 1));

for(c = 0; c < 3; c++)

{

scanf("%d", &marks[r][c]);

}

}

//find max mark

for(r = 0; r < 5; r++)

{

maxMark[r] = 0;

for(c = 0; c < 3; c++)

{

if (marks[r][c] > maxMark[r])

{

maxMark[r] = marks[r][c];

}

}

}

//output

printf("---------- Max Marks ----------\n");

for(r = 0; r < 5; r++)

{

printf("Max mark of Student #%d is %d\n", (r + 1), maxMark[r]);

}

}

1. **Write and execute a c program to read a matrix using keyboard, count the total number of non-zero elements in it and display the result.**

#include <stdio.h>

void main()

{

int a[10][10],i,j,c=0,m,n;

printf("Enter size of row in a matrix");

scanf("%d",&m);

printf("Enter size of col in a matrix");

scanf("%d",&n);

printf("Enter Elements for Matrix :\n\n");

for(i=0;i<m;i++) // j is used for rows

for(j=0;j<n;j++) // i is used for columns

{

scanf("%d",&a[i][j]);

}

/\*Printing Matrix \*/

printf("\nMatrix of Size 3\*5: \n\n");

for(i=0;i<m;i++)

{

for(j=0;j<n;j++)

{

printf("%3d ",a[i][j]);

}

printf("\n");

}

/\* Count the total number of zeros in matrix 3\*5 \*/

for(i=0;i<m;i++)

for(j=0;j<n;j++)

if(a[i][j]!=0)

c++;

printf("Non zeros present in the Matrix: %d",c);

}

1. **Write and execute a c program to read a matrix using keyboard and initialize all the diagonal elements to zero for a two-dimensional array and print the result in matrix format**.

#include <stdio.h>

void main()

{

int m,n,mat[10][10];

printf("Enter size of matrix\n");

scanf("%d%d",&m,&n);

printf("Enter elements\n");

for (int i = 0; i < m; i++)

{

for (int j = 0; j < n; j++)

scanf("%d",&mat[i][j]);

}

for (int i = 0; i < n; i++)

{

for (int j = 0; j < m; j++)

{

if (i == j|| (i + j + 1) == n)

mat[i][j] = 0;

}

}

Printf(“Resultant matrix is \n”);

for (int i = 0; i < n; i++)

{

for (int j = 0; j < m; j++)

printf("%d\t",mat[i][j]);

printf("\n");

}

}