2-D ARRAYS

UNIT-IV

- 2-D arrays are also called as matrix
- In the beginning of program it is important to declare arrays and define their size.
- int arr[i][j];

Processing in 2-D arrays

int mat[2][3];

1. Reading values in mat

```
for(i=0;i<2;i++)
    for(j=0;j<3;j++)
        scanf("%d",&mat[i][j]);
```

2. Displaying values of mat

```
for(i=0;i<2;i++)
    for(j=0;j<3;j++)
        printf("%d",mat[i][j]);
```

/* WAP to input and display a matrix */

```
#include<stdio.h>
#include<conio.h>
#define ROW 2
#define COL 3
void main()
{
int mat[ROW][COL],i,j;
printf("enter the value of matrix:");
for(i=0;i<ROW;i++)
    for(j=0;j<COL;j++)
            scanf("%d",&mat[i][j]);
printf("the matrix that you have enterd is:");
for(i=0;i<ROW;i++)
    for(j=0;j<COL;j++)
            printff("%d",mat[i][j]);
getch();
}
```

/* WAP for addition of two matrix */

```
#include<stdio.h>
#include<conio.h>
#define ROW  2
#define COL  3
void main()
{
int mat1[ROW][COL],mat2[ROW][COL],mat3[ROW[COL];
int i,j;
printf("enter the values for matrix1:");
for(i=0;i<ROW;i++)
	for(j=0;j<COL;j++)
		scanf("%d",&mat1[i][j]);
printf("enter the values for matrix2:");
for(i=0;i<ROW;i++)
	for(j=0;j<COL;j++)
		scanf("%d",&mat2[i][j]);
printf("addition");
for(i=0;i<ROW;i++)
	for(j=0;j<COL;j++)
		mat3[i][j]=mat1[i][j]+mat2[i][j];
printf("matrix3 after addition:");
for(i=0;i<ROW;i++)
	for(j=0;j<COL;j++)
		printf("%d",mat3[i][j]);
getch();
}
```

/* WAP to multiply two matrices */

```
#include<stdio.h>
#include<conio.h>
#define ROW1 2
#define COL1 3
#define ROW2 COL1
#define COL2 3
void main()
{
int mat1[ROW1][COL1],mat2[ROW2][COL2],mat3[ROW1][COL2];
int i,j,k;
printf("enter the values for matrix1:");
for(i=0;i<ROW1;i++)
        for(j=0;j<COL1;j++)
                scanf("%d",&mat1[i][j]);
printf("enter the values for matrix2:");
for(i=0;i<ROW2;i++)
        for(j=0;j<COL2;j++)
                scanf("%d",&mat2[i][j]);
printf("multiplication");
for(i=0;i<ROW1;i++)
        for(j=0;j<COL2;j++)
        {
        mat3[i][j]=0;
        for(k=0;K<COL1;k++)
        mat3[i][j]=mat3[i]][j]+mat1[i][k]*mat2[k][j];
        }
printf("resultant matrix");
for(i=0;i<ROW1;i++)
        for(j=0;j<COL2;j++)
                printf("%d",mat3[i][j]);
getch();
}
```

Program to find the transpose of Matrix

```
#include<stdio.h>
#include<conio.h>
#define row 3
#define col 4
Void main()
{
Int mat1[row][col],mat2[col][row],I,j;
Printf(“enter matrix mat1”);
for(i=0;i<row;i++)
for(j=0;j<col;j++)
Scanf(“%d”,&mat1[i][j]);
for(i=0;i<col;i++)
for(j=0;j<row;j++)
mat2[i] [j] = mat1[j] [i];
Printf(“transpose of matrix is”);
for(i=0;i<col;i++)
{
for(j=0;j<row;j++)
Printf(“%d”,mat2 [i] [j]);
Printf(“\n”);
}
}
```