SNS COLLEGE OF TECHNOLOGY

Coimbatore-35.
An Autonomous Institution

COURSE NAME 23ITT101 PROGRAMMING IN C AND DATASRUCTURES

I YEAR/ II SEMESTER

TWO DIMENSIONAL ARRAYS

Dr.B.Vinodhini
Associate Professor
Department of Computer Science and Engineering

Two Dimensional Arrays

Definition

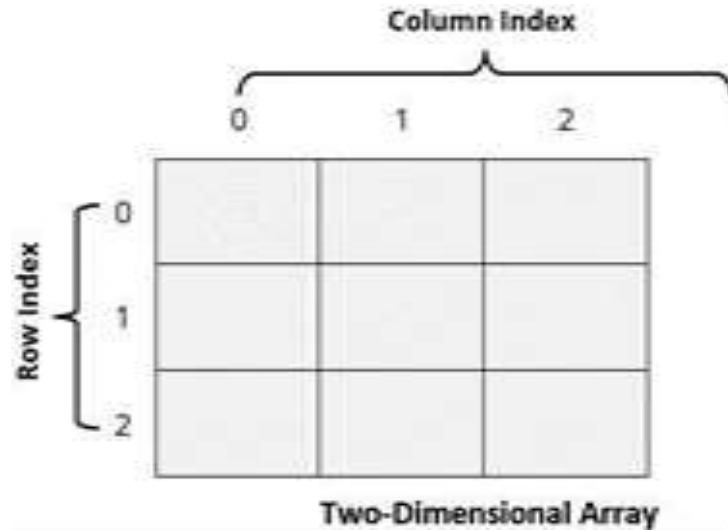Two dimensional arrays are used in a situation where a table of values need to store in an array.

Two Dimensional array Declaration

Syntax:

datatype arrayname [row size][column size];

Example:

int a[3][3];

Two-Dimensional Array

Two Dimensional array Initialization

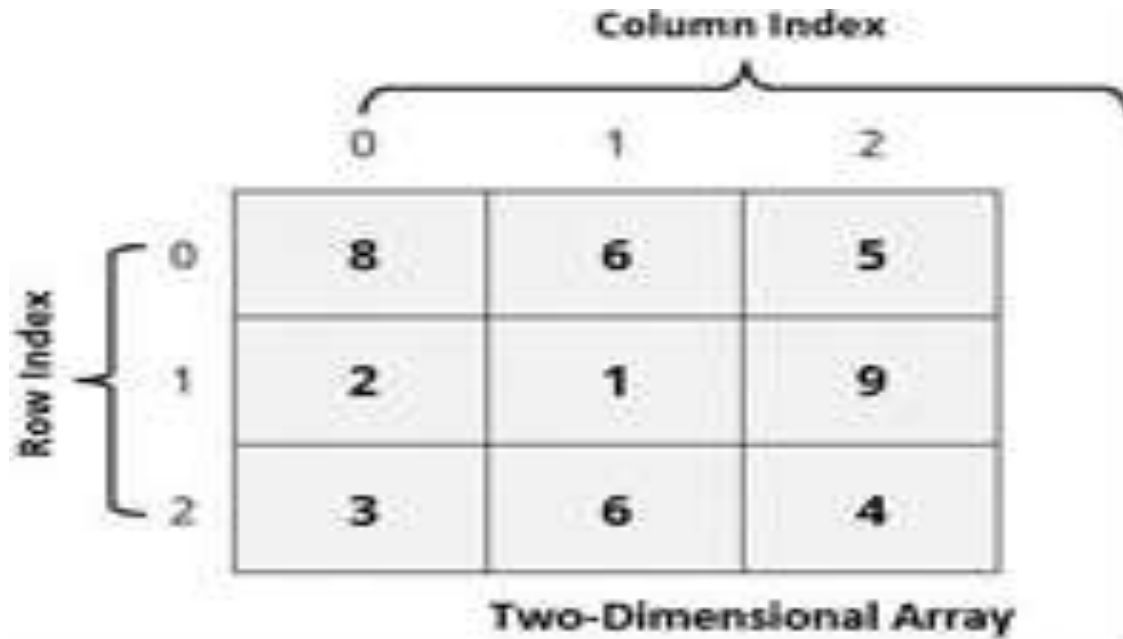**Two Dimensional array Initialization**

Syntax:

datatype arrayname [row size][column size]={list of values};

Example

int a[3][3]={8,6,5,2,1,9,3,6,4};

Two-Dimensional Array

Multi Dimensional Array

a[0][0]   a[0][1]   a[0][2]   a[0][3]

a[1][0]   a[1][1]   a[1][2]   a[1][3]

a[2][0]   a[2][1]   a[2][2]   a[2][3]

Multi Dimensional Array

We use the following general syntax to access the individual elements of a two-dimensional array...

arrayName [rowIndex] [columnIndex]

Example Code

```
matrix_A [0][1] = 10 ;
```

In the above statement, the element with row index 0 and column index 1 of **matrix_A** array is assinged with value **10**.

PROGRAM:
```c
#include<stdio.h>
int main(){
  /* 2D array declaration*/
  int disp[2][3];
int i, j;
  for(i=0; i<2; i++) {
    for(j=0;j<3;j++) {
      printf("Enter value for disp[%d][%d]:", i, j);
      scanf("%d", &disp[i][j]);
    }
  }
printf("Two Dimensional array elements:\n");
  for(i=0; i<2; i++) {
    for(j=0;j<3;j++) {
      printf("%d ", disp[i][j]);
      if(j==2){
        printf("\n");
      }
    }
  }
  return 0;
}
```

Output:
Enter value for disp[0][0]:1
Enter value for disp[0][1]:2
Enter value for disp[0][2]:3
Enter value for disp[1][0]:4
Enter value for disp[1][1]:5
Enter value for disp[1][2]:6
Two Dimensional array elements:
1 2 3
4 5 6

Multi Dimensional Array

```c
// C program to find the sum of two matrices of order 2*2

#include <stdio.h>
int main()
{
  float a[2][2], b[2][2], result[2][2];

  // Taking input using nested for loop
  printf("Enter elements of 1st matrix\n");
  for (int i = 0; i < 2; ++i)
    for (int j = 0; j < 2; ++j)
    {
      printf("Enter a%d%d: ", i + 1, j + 1);
      scanf("%f", &a[i][j]);
    }

  // Taking input using nested for loop
  printf("Enter elements of 2nd matrix\n");
  for (int i = 0; i < 2; ++i)
    for (int j = 0; j < 2; ++j)
    {
      printf("Enter b%d%d: ", i + 1, j + 1);
      scanf("%f", &b[i][j]);
    }

  // adding corresponding elements of two arrays
  for (int i = 0; i < 2; ++i)
    for (int j = 0; j < 2; ++j)
    {
```

Multi Dimensional Array

Output

```
Enter elements of 1st matrix
Enter a11: 2;
Enter a12: 0.5;
Enter a21: -1.1;
Enter a22: 2;
Enter elements of 2nd matrix
Enter b11: 0.2;
Enter b12: 0;
Enter b21: 0.23;
Enter b22: 23;

Sum Of Matrix:
2.2      0.5
-0.9     25.0
```