



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35.

An Autonomous Institution

COURSE NAME 23CST101 PROBLEM SOLVING AND C PROGRAMMING

I YEAR/ I SEMESTER

UNIT-III ARRAYS AND STRINGS

Topic: Array Types



Two Dimensional Arrays

Definition

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

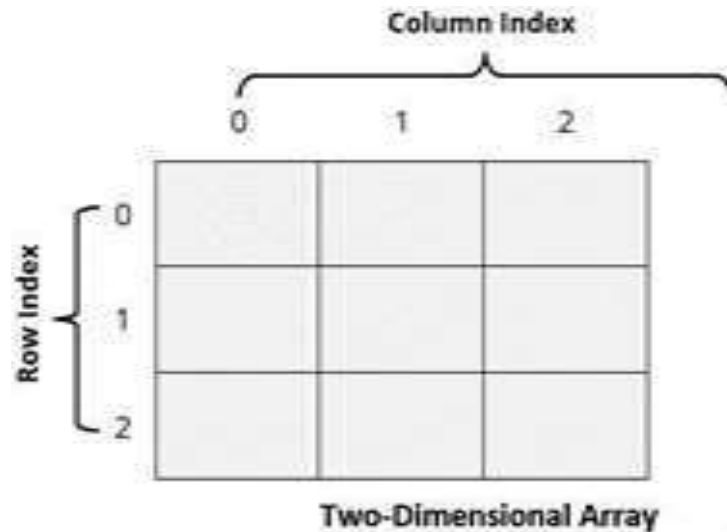
Two Dimensional array Declaration

Syntax:

```
datatype arrayname [row size][column size];
```

Example:

```
int a[3][3];
```





Two Dimensional array Initialization

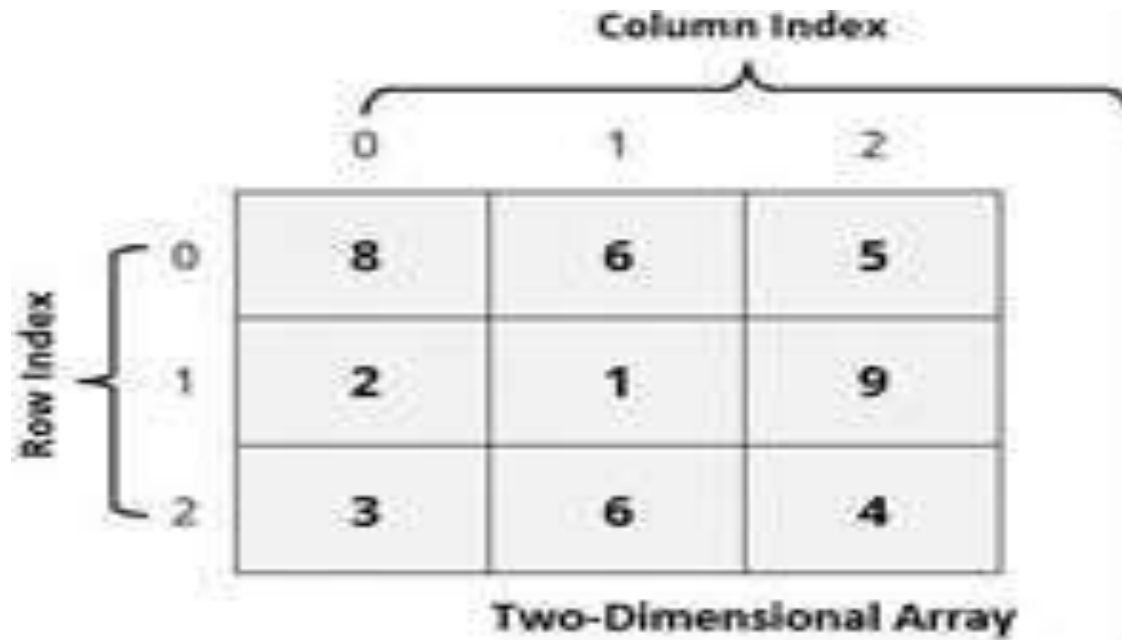
Two Dimensional array Initialization

Syntax:

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

Example

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



**PROGRAM:**

```
#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:
```



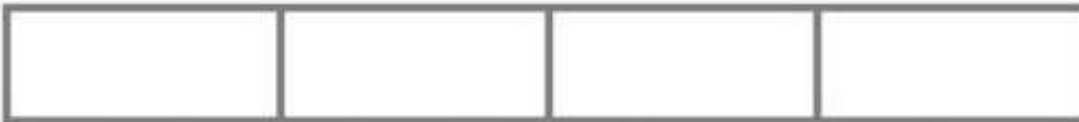
Multi Dimensional Array



`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 assigned with value 10.



Multi Dimensional Array

```
// 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
```