**C# Multidimensional Arrays**

The multidimensional array is also known as rectangular arrays in C#. It can be two dimensional or three dimensional. The data is stored in tabular form (row \* column) which is also known as matrix.

To create multidimensional array, we need to use comma inside the square brackets. For example:

1. int[,] arr=new int[3,3];//declaration of 2D array
2. int[,,] arr=new int[3,3,3];//declaration of 3D array

**C# Multidimensional Array Example**

Let's see a simple example of multidimensional array in C# which declares, initializes and traverse two dimensional array.

1. using System;
2. public class MultiArrayExample
3. {
4. public static void Main(string[] args)
5. {
6. int[,] arr=new int[3,3];//declaration of 2D array
7. arr[0,1]=10;//initialization
8. arr[1,2]=20;
9. arr[2,0]=30;
11. //traversal
12. for(int i=0;i<3;i++){
13. for(int j=0;j<3;j++){
14. Console.Write(arr[i,j]+" ");
15. }
16. Console.WriteLine();//new line at each row
17. }
18. }
19. }

Output:

0 10 0

0 0 20

30 0 0

**C# Multidimensional Array Example: Declaration and initialization at same time**

There are 3 ways to initialize multidimensional array in C# while declaration.

1. int[,] arr = new int[3,3]= { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };

We can omit the array size.

1. int[,] arr = new int[,]{ { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };

We can omit the new operator also.

1. int[,] arr = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };

Let's see a simple example of multidimensional array which initializes array at the time of declaration.

1. using System;
2. public class MultiArrayExample
3. {
4. public static void Main(string[] args)
5. {
6. int[,] arr = { { 1, 2, 3 }, { 4, 5, 6 }, { 7, 8, 9 } };//declaration and initialization
8. //traversal
9. for(int i=0;i<3;i++){
10. for(int j=0;j<3;j++){
11. Console.Write(arr[i,j]+" ");
12. }
13. Console.WriteLine();//new line at each row
14. }
15. }
16. }

Output:

1 2 3

4 5 6

7 8 9