2D array

2-Dimensional Arrays

- 2-D Arrays can be defined as an array of arrays,
- It can also represent a Matrix,
- Each element is represented as Arr[row][column], where Arr[][] is the 2D array.

	Col1	Col2	Col3	Col4	....
Row1	Arr[0][0]	Arr[0][1]	Arr[0][2]	Arr[0][3]	
Row2	Arr[1][0]	Arr[1][1]	Arr[1][2]	Arr[1][3]	
Row3	Arr[2][0]	Arr[2][1]	Arr[2][2]	Arr[2][3]	
Row4	Arr[3][0]	Arr[3][1]	Arr[3][2]	Arr[3][3]	

Useful link

https://www.dremendo.com/cpp-programming-tutorial/cpp-two-dimensional-array

Initializing a 2D array in C++

So, how do we initialize a two-dimensional array in C++? As simple as this:

int arr[4][2] = {

{1234, 56},

{1212, 33},

{1434, 80},

{1312, 78}

} ;

So, as you can see, we initialize a 2D array arr, with 4 rows and 2 columns as an array of arrays. Each element of the array is yet again an array of integers.

We can also initialize a 2D array in the following way.

int arr[4][2] = {1234, 56, 1212, 33, 1434, 80, 1312, 78};

In this case too, arr is a 2D array with 4 rows and 2 columns.

Printing a 2D Array in C++

```cpp
#include<iostream>
using namespace std;
main( )
{
    int arr[4][2] = {
        { 10, 11 },
        { 20, 21 },
        { 30, 31 },
        { 40, 41 }
        } ;

    int i,j;

    cout<<"Printing a 2D Array:\n";
    for(i=0;i<4;i++)
    {
        for(j=0;j<2;j++)
        {
            cout<<"\t"<<arr[i][j];
        }
        cout<<endl;
    }
}
```

Taking 2D Array Elements As User Input

```cpp
#include<iostream>
using namespace std;
main( )
{
    int  s[2][2];
    int  i, j;
    cout<<"\n2D Array Input:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
        cout<<"\ns["<<i<<"]["<<j<<"]=  ";
        cin>>s[i][j];
      }
    }

    cout<<"\nThe 2-D Array is:\n";
    for(i=0;i<2;i++)
    {
      for(j=0;j<2;j++)
      {
        cout<<"\t"<<s[i][j];
      }
      cout<<endl;
    }
}
```

Problem

Matrix Addition using Two Dimensional Arrays in C++