Arrays

Array:- **Arrays are used to store multiple values in a single variable, instead of declaring separate variables for each value.**

It is a collection of similar data type is called array.

Value initialization in array:-

1. **int a[5]={10,20,40,54,65};**
2. **int a[5]={10,20,5*40,54,65};**
3. **int x=4,a[5]={10,x,40,54,65};**
4. **int a[]={10,20,40,54,65,65,87};**

Basically array in three types.

1. **Single dimensional array**
2. **Two dimensional array.**
3. **Three or multi-dimensional array.**

1.*Single dimensional array:-*An array with only one subscript is known as one-dimensional array. A subscript is a number in brackets that follows an array's name. This number can identify the number of individual elements in the array.

Syntax:-

```
array_type Array_name[size];
```

***Example:-*write a program put any five number and find sum.**

Solution:-

```
#include<iostream>

using namespace std;

int main()
```

```
{
        int a[5],s=0;
        cout<<"Enter one number";
        for(int i=0;i<=4;i++)
        {
                scanf("%d",&a[i]);
        }
        for(int i=0;i<=4;i++)
        {
                s=s+a[i];
        }
        printf("sum=%d",s);
        return 0;
}
```

Output:-

```
Enter five number    4
                     5
                     6
                     6
                     7
Sum=28
```

2.*Two dimensional array:-*An array with two subscripts is called two-dimensional array. We know that a one-dimensional array can store a row of elements of same type so a two-dimensional array enables us to store multiple rows of elements, that is a table of values or Matrix. The first subscript refers to the row and the second subscript refers to the column.

Syntax:-

```
array_type Array_name[row_size][column_size];
```

***Example:-*write to create 3*4 size array put any 12 element and find a sum.**

Solution:-

```
#include<iostream>
using namespace std;
int main()
{
	int a[3][4],i,j,s=0;
	cout<<"Enter 12 number";
	for(int i=0;i<=2;i++)
	{
		for(int j=0;j<=3;j++)
	{
		scanf("%d",&a[i][j]);
	}
}
	for(int i=0;i<=2;i++)
	{
		for(int j=0;j<=3;j++)
		{
```

```
                s=s+a[i][j];
            }
        }
            printf("sum=%d",s);
            return 0;
        }
```

Output:-

```
Enter five number   4
                    5
                    6
                    7
                    9
                    8
                    0
                    11
                    12
                    1
                    2
                    3
Sum=68
```

3.*Three or multi-dimensional array:-*Multi-dimensional arrays can be described as “arrays of arrays”. In other words, an array with more than one subscript is generally called a multi-dimensional array. For example, a bi-di-mensional array can be imagined as a bi-dimen-sional table made of elements, all of then of a same uniform data type.

Syntax:-

```
array_type Array_name[array-size][row_size][column_size];
```

Example:-

```
#include<iostream>
using namespace std;
int main()
{
   // initializing the 3-dimensional array
   int x[2][3][2] =
   {
      { {0,1}, {2,3}, {4,5} },
      { {6,7}, {8,9}, {10,11} }
   };

   // output each element's value
   for (int i = 0; i < 2; ++i)
   {
      for (int j = 0; j < 3; ++j)
      {
         for (int k = 0; k < 2; ++k)
         {
            cout << "Element at x[" << i << "][" << j
                 << "][" << k << "] = " << x[i][j][k]
                 << endl;
         }
      }
   }
   return 0;
}
```

Output:-

```
Element at x[0][0][0] = 0
Element at x[0][0][1] = 1
```

Element at x[0][1][0] = 2

Element at x[0][1][1] = 3

Element at x[0][2][0] = 4

Element at x[0][2][1] = 5

Element at x[1][0][0] = 6

Element at x[1][0][1] = 7

Element at x[1][1][0] = 8

Element at x[1][1][1] = 9

Element at x[1][2][0] = 10

Element at x[1][2][1] = 11

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