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C++ arrays

- An array is a collection of elements of the same type placed in contiguous memory locations that can be individually referenced by using an index to a unique identifier.
- Five values of type int can be declared as an array without having to declare five different variables (each with its own identifier).

<iomanip> library

<iomanip> is a library in C++ to control input/output.

There are many functions in <iomanip> library.

These are:

setw()-width()

setfill()

setprecision()

setbase() - resetiosflags()

setf() - unsutf()

setiosflags()

Ex-1: <iomanip> library

```
#include <iostream>
using namespace std;

#include <iomanip>
using std::setw;

int main () {

  int n[ 10 ]; // n is an array of 10 integers

  // initialize elements of array n to 0
  for ( int i = 0; i < 10; i++ ) {
    n[ i ] = i + 100; // set element at location i to i + 100
  }
  cout << "Element" << setw( 13 ) << "Value" << endl;

  // output each array element's value
  for ( int j = 0; j < 10; j++ ) {
    cout << setw( 7 )<< j << setw( 13 ) << n[ j ] << endl;
  }

  return 0;
}
```

Element	Value
0	100
1	101
2	102
3	103
4	104
5	105
6	106
7	107
8	108
9	109

Ex-2: Using array

```
#include <iostream>

using namespace std;

int main()
{
  int myarray[3] = {10,20,30};

  for (int i=0; i<3; ++i)
    ++myarray[i];

  for (int elem : myarray)
    cout << elem << '\n';
}
```

```
#include <iostream>
#include <array>
using namespace std;

int main()
{
  array<int,3> myarray {10,20,30};

  for (int i=0; i<myarray.size(); ++i)
    ++myarray[i];

  for (int elem : myarray)
    cout << elem << '\n';
}
```

```
11
21
31
```

Ex-3: array with string

```
// strings
#include <iostream>
#include <string>
using namespace std;

int main ()
{
  char question1[] = "What is your name? ";
  string question2 = "Where do you live? ";
  char answer1 [80];
  string answer2;
  cout << question1;
  cin >> answer1;
  cout << question2;
  cin >> answer2;
  cout << "Hello, " << answer1;
  cout << " from " << answer2 << "!\n";
  return 0;
}
```

```
What is your name? yesim
Where do you live? ankara
Hello, yesim from ankara!
```

Arrays in 2-dimension

	Column 0	Column 1	Column 2	Column 3
Row 0	a[0][0]	a[0][1]	a[0][2]	a[0][3]
Row 1	a[1][0]	a[1][1]	a[1][2]	a[1][3]
Row 2	a[2][0]	a[2][1]	a[2][2]	a[2][3]

Ex-4: Array in 2-dim.

```
#include <iostream>
using namespace std;

int main () {
  // an array with 5 rows and 2 columns.
  int a[5][2] = { {0,0}, {1,2}, {2,4}, {3,6},{4,8}};

  // output each array element's value
  for ( int i = 0; i < 5; i++ )
    for ( int j = 0; j < 2; j++ ) {

      cout << "a[" << i << "][" << j << "]: ";
      cout << a[i][j]<< endl;
    }

  return 0;
}
```

```
a[0][0]: 0
a[0][1]: 0
a[1][0]: 1
a[1][1]: 2
a[2][0]: 2
a[2][1]: 4
a[3][0]: 3
a[3][1]: 6
a[4][0]: 4
a[4][1]: 8
```

Ex-5: Arrays in C++

```
#include <iostream>
#include <string>
using namespace std;
int main()
{
        int myarray[5] = {100,200,300,400,500};
        int sum = 0;
        for(int i = 0;i<5;i++)
        {
                sum += myarray[i];
        }
        cout<<"Sum of elements in myarray:\n
"<<sum;
}
```

```
Sum of elements in myarray:
 1500
```

Ex-6: Arrays-2

```
#include <iostream>
using namespace std;

int main()
{
   int test[3][2] =
   {
      {2, -2},
      {3, 0},
      {7, 1}
   };

   // Accessing two dimensional array using
   // nested for loops
   for(int i = 0; i < 3; ++i)
   {
      for(int j = 0; j < 2; ++j)
      {
         cout<< "test[" << i << "][" << j << "] = " << test[i][j] << endl;
      }
   }
   return 0;
}
```

```
test[0][0] = 2
test[0][1] = -2
test[1][0] = 3
test[1][1] = 0
test[2][0] = 7
test[2][1] = 1
```

Ex-7: define in C++

```
#include <iostream>
using namespace std;

#define MIN(a,b) (((a)<(b)) ? a : b)

int main () {
  int i, j;

  i = 200;
  j = 120;

  cout <<"The minimum is " << MIN(i, j) << endl;

  return 0;
}
```

The minimum is 120

Ex-8: switch-case-break

```
#include <iostream>
using namespace std;
int main () {
  // local variable declaration:
  char grade = 'F';

  switch(grade) {
    case 'A' :
      cout << "Excellent!" << endl;
      break;
    case 'B' :
    case 'C' :
      cout << "Well done" << endl;
      break;
    case 'D' :
      cout << "You passed" << endl;
      break;
    case 'F' :
      cout << "Better try again" << endl;
      break;
    default :
      cout << "Invalid grade" << endl;
  }
  cout << "Your grade is " << grade << endl;

  return 0;
}
```

```
Better try again
Your grade is F
```