

**Course
&
Test Series**

Introduction to 'C++' Language

Arrays and Strings in C Plus Plus

Module 1 - Arrays in C Plus Plus

 **CBSE**

In C++, an array is a data structure that is used to store multiple values of similar data types in a contiguous memory location.

 **ICSE**

For example, if we have to store the marks of 4 or 5 students then we can easily store them by creating 5 different variables but what if we want to store marks of 1000 students or say 5000 students then it becomes very challenging to create that numbers of variable and manage them. Now, arrays come into the picture that can do it easily by just creating an array of the required size.

 **NTSE**

 **Banking & Insurance**

 **Central Govt. Service**

 **State Govt. Services**

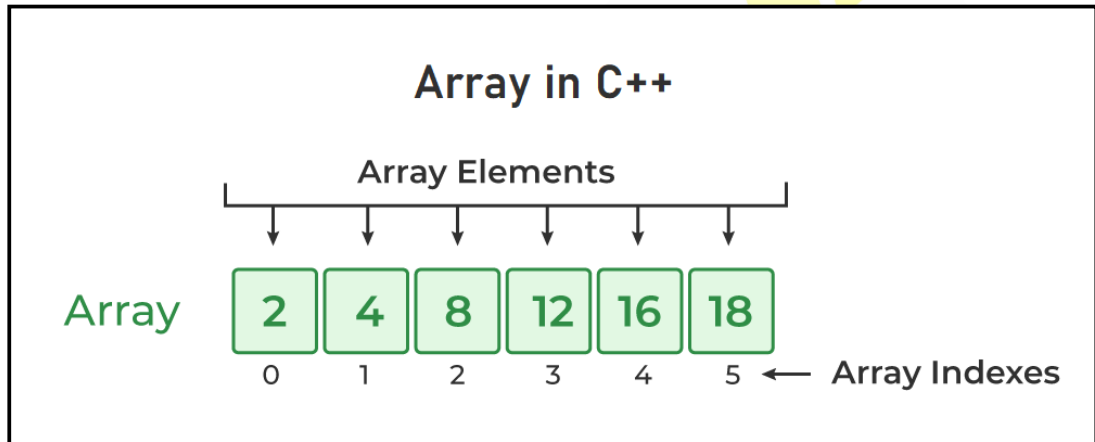
 **LAW Entrance**

 **MBA Entrance**

 **Railways & Metro Services**

...many more

abhyasonline.in



Properties of Arrays in C++

- An Array is a collection of data of the same data type, stored at a contiguous memory location.
- Indexing of an array starts from 0. It means the first element is stored at the 0th index, the second at 1st, and so on.
- Elements of an array can be accessed using their indices.
- Once an array is declared its size remains constant throughout the program.

Array Declaration in C++

In C++, we can declare an array by simply specifying the data type first and then the name of an array with its size.

```
data_type array_name[Size_of_array];
```

Example

```
int arr[5];  
Here,
```

**Course
&
Test Series**

Introduction to 'C++' Language

 **CBSE**

- **int:** It is the type of data to be stored in the array. We can also use other data types such as char, float, and double.
- **arr:** It is the name of the array.
- **5:** It is the size of the array which means only 5 elements can be stored in the array.

 **ICSE**

Initialization of Array in C++

In C++, we can initialize an array in many ways but we will discuss some most common ways to initialize an array. We can initialize an array at the time of declaration or after declaration.

 **NTSE**

1. Initialize Array with Values in C++

We have initialized the array with values. The values enclosed in curly braces '{ }' are assigned to the array. Here, 1 is stored in arr[0], 2 in arr[1], and so on. Here the size of the array is 5.

```
int arr[5] = {1, 2, 3, 4, 5};
```

 **Banking & Insurance**

2. Initialize Array with Values and without Size in C++

We have initialized the array with values but we have not declared the length of the array, therefore, the length of an array is equal to the number of elements inside curly braces.

 **Central Govt. Service**

```
int arr[] = {1, 2, 3, 4, 5};
```

 **State Govt. Services**

3. Initialize Array after Declaration (Using Loops)

We have initialized the array using a loop after declaring the array. This method is generally used when we want to take input from the user or we cant to assign elements one by one to each index of the array. We can modify the loop conditions or change the initialization values according to requirements.

 **LAW Entrance**

```
for (int i = 0; i < N; i++) {
    arr[i] = value;
}
```

 **MBA Entrance**

4. Initialize an array partially in C++

Here, we have declared an array 'partialArray' with size '5' and with values '1' and '2' only. So, these values are stored at the first two indices, and at the rest of the indices '0' is stored.

 **Railways & Metro Services**

```
int partialArray[5] = {1, 2};
```

5. Initialize the array with zero in C++

...many more

abhyasonline.in

Course
&
Test Series

Introduction to 'C++' Language

We can initialize the array with all elements as '0' by specifying '0' inside the curly braces. This will happen in case of zero only if we try to initialize the array with a different value say '2' using this method then '2' is stored at the 0th index only.

```
int zero_array[5] = {0};
```

Solved Example: The C++ Program to Illustrate How to Access Array Elements

```
// C++ Program to Illustrate How to Access Array Elements  
#include <iostream>  
using namespace std;
```

```
int main()  
{
```

```
    int arr[3];
```

```
    // Inserting elements in an array  
    arr[0] = 10;  
    arr[1] = 20;  
    arr[2] = 30;
```

```
    // Accessing and printing elements of the array  
    cout << "arr[0]: " << arr[0] << endl;  
    cout << "arr[1]: " << arr[1] << endl;  
    cout << "arr[2]: " << arr[2] << endl;
```

```
    return 0;
```

```
}
```

 CBSE

 ICSE

 NTSE

 Banking & Insurance

 Central Govt. Service

 State Govt. Services

 LAW Entrance

 MBA Entrance

 Railways & Metro Services

...many more

abhyasonline.in

A **one-dimensional array** in C++ is a data structure that allows you to store a fixed-size, sequential collection of elements of the same data type.

Solved Example: Finding the Largest Element in C++

```
#include <iostream>

using namespace std;

int main()
{
    // Declare and initialize the array

    int arr[] = {25, 50, 15, 40, 30};
    int size = 5; // Manually specify the size of the array

    // Assume the first element is the largest
    int largest = arr[0];

    // Loop through the array starting from the second element
    for (int i = 1; i < size; i++) {
        if (arr[i] > largest) {
            largest = arr[i]; // Update the largest value
        }
    }

    // Output the largest element
    cout << "Largest element: " << largest << endl;
    return 0;
}
```

Explanation or Logic of the above program:

- The program assumes the first element is the largest (largest = arr[0]).
- It iterates through the rest of the array using a for loop.
- For each element, it compares the current element (arr[i]) with largest.
- If a larger element is found, it updates largest.



...many more

abhyasonline.in



A **two-dimensional array** in C++ is like a table or matrix, where data is organized in rows and columns. It can be used to store and manage grid-like data structures.

Declaration and Initialization

Syntax:

```
datatype arrayName[rows][columns];
```

- **datatype**: Type of data stored in the array (e.g., int, float, char).
- **arrayName**: Name of the array.
- **rows**: Number of rows.
- **columns**: Number of columns.

Solved Example: Input and Output for a 2D Array

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

```
int main() {  
    int rows = 2, cols = 3; // Specify size  
    int arr[2][3];        // Declare a 2x3 array  
  
    // Input elements  
    cout << "Enter elements of the 2D array:" << endl;  
    for (int i = 0; i < rows; i++) {  
        for (int j = 0; j < cols; j++) {  
            cin >> arr[i][j];  
        }  
    }  
  
    // Output the array  
    cout << "2D Array Elements:" << endl;  
    for (int i = 0; i < rows; i++) {  
        for (int j = 0; j < cols; j++) {  
            cout << arr[i][j] << " ";  
        }  
        cout << endl;  
    }  
  
    return 0;  
}
```

NOTE: In C++, **endl** is used to insert a newline character and flush the output buffer.



...many more

abhyasonline.in

Course
&
Test Series

Introduction to 'C++' Language

Assignment

Ques 1: Write a program to:

- Declare a one-dimensional array of size 5.
- Input 5 integer values from the user into the array.
- Find and display:
 - The sum of all the elements.
 - The smallest element in the array.

Ques 2: Write a program to:

- Declare a 2x3 matrix (2 rows and 3 columns).
- Input values into the matrix from the user.
- Calculate and display:
 - The sum of all elements in the matrix.

CBSE

ICSE

NTSE

Banking & Insurance

Central Govt. Service

State Govt. Services

LAW Entrance

MBA Entrance

Railways & Metro Services

...many more

abhyasonline.in

