

និន្យាស្ថានមម្លេងនិន្យាងម្លុំបា

Institute of Technology of Cambodia

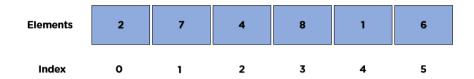
TP-08
Working with Array
in C++

Academic Year: 2022 - 2023

1. C++ Arrays

Array is a variable that can store multiple values of the same type.

To declare an array, define the variable type, specify the name of the array followed by **square brackets** and specify the number of elements it should store:



Syntax: dataType arrayName[arraySize];

Example:

```
string cars[4];
string cars[4] = {"Volvo", "BMW", "Ford", "Mazda"};
string cars[] = {"Volvo", "BMW", "Ford"};
int myNum[3] = {10, 20, 30};
```

2. Displaying Array Elements

In C++, each element in an array is associated with a number. The number is known as an array index. We can access elements of an array by using those indices.

Example:

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

int main() {
    int numbers[5] = {7, 5, 6, 12, 35};

    cout << "The numbers are: ";

    // Printing array elements
    // using range based for loop
    for (const int &n : numbers) {
        cout << " ";
    }

    cout << "\nThe numbers are: ";

    // Printing array elements
    // using traditional for loop
    for (int i = 0; i < 5; ++i) {
        cout << numbers[i] << " ";
    }

    return 0;
}</pre>
```

Output

```
The numbers are: 7 5 6 12 35
The numbers are: 7 5 6 12 35
```

3. Inputs from User and Store in Array

We have used a for loop to iterate from i = 0 to i = 4. In each iteration, we took an input from the user and stored it in **numbers**[i].

Example:

```
#include <iostream>
using namespace std;
int main() {
  int numbers[5];

  cout << "Enter 5 numbers: " << endl;

  // store input from user to array
  for (int i = 0; i < 5; ++i) {
     cin >> numbers[i];
  }

  cout << "The numbers are: ";

  // print array elements
  for (int n = 0; n < 5; ++n) {
     cout << numbers[n] << " ";
  }

  return 0;
}</pre>
```

Output

```
Enter 5 numbers:
11
12
13
14
15
The numbers are: 11 12 13 14 15
```

4. Sum and Average of Array Elements

We have used a for loop to iterate from i = 0 to i = 4. In each iteration, we took an input from the user and stored it in **numbers**[i].

Example:

```
#include <iostream>
using namespace std;
int main() {
    // initialize an array without specifying size
    double numbers[] = {7, 5, 6, 12, 35, 27};
   double sum = 0;
    double count = 0;
   double average;
   cout << "The numbers are: ";</pre>
    // print array elements
    // use of range-based for loop
    for (const double &n : numbers) {
        cout << n << " ";
        // calculate the sum
        sum += n;
        // count the no. of array elements
        ++count;
    // print the sum
   cout << "\nTheir Sum = " << sum << endl;</pre>
    // find the average
    average = sum / count;
    cout << "Their Average = " << average << endl;</pre>
```

Output

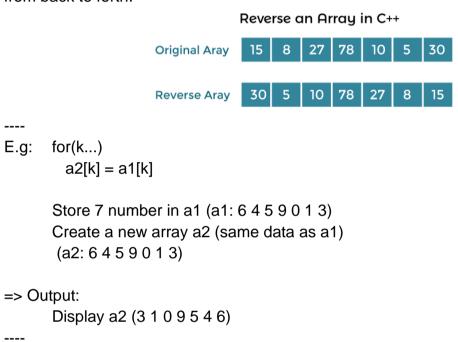
```
The numbers are: 7 5 6 12 35 27
Their Sum = 92
Their Average = 15.3333
```

Problem1:

Write a program in C++ to ask a user for 10 numbers and store in an array. Display all numbers in array.

Problem2:

Write a program in C++ to store 7 numbers in an array called a1. Create a new array call a2. Make a2 has the data as same as a1 (copy a1 to a2). Display numbers in a2 from back to forth.



Problem3:

Write a program in C++ to store 5 numbers in an array (ask input from user). Find sum of all numbers in array and also average. Display sum and average on screen.

Problem4:

Write a program in C++ program to store data of 5 students. Each student has name, score, email and phone number. The program ask user for info of these 5 students. Display all students' information on screen.

```
E.g: Input: John 75 john@gamil.com 012433443
```

```
#Student1
John
75
john@gmailcom
012
#Student2
Johny
85
johny@gmailcom
011
```

Problem5:

Same as problem#4. Find average score. The program display info of all students who got scores more than average.

Input data
Find average score (5 students, sum/5)
Display students who score>= average
