

Tutorial 7 Arrays

Please test the correctness of your **program in 1a), 1c) and 2b)** using PASS.

1. Download **simpleArray.cpp**. The program defines and initializes an array of 10 integers.

```
int num[10]={5,10,2,5,8, 8, 7,9, 1,5};
```

a) Modify the program so that it asks the user to input an integer $1 \leq i \leq 10$. The program should print the value of the i^{th} integer. For example, suppose the user inputs 3, the program should output the 3rd integer (*with array index 2*) in the array.

3
2

b) Write a for-loop to print out the content of the array as follows.
Name the file **simpleArray2.cpp**.

5
10
2
5
8
8
7
9
1
5

c) Modify the program such that it asks the user to input an integer. The program should output the *index* of the *first* occurrence of the integer in the array. The program should output -1 if the input number does not exist in the array. Name the file **simpleArray3.cpp**

Example 1: The user enters 9. The program should print 7 (*the 8th number in the array*), which is the index of the first occurrence of the number.

9
7

Example 2: The user enters 11. Since the number does not appear in the array, the program should print -1.

11
-1

2a) Modify the programs in question **1b)** such that it print a bar chart for the values in the array as follows. Name the file **printChart.cpp**

```
*****
*****
**
*****
*****
*****
*****
*****
*
*****
```

Hint: You should use [nested-for loops](#).

The outer-for repeatedly retrieve the value $a[i]$ where $0 \leq i < 10$ and the inner-for loop is used to print '' n times, followed by [endl](#)*

b) Modify the program in part **2a)** such that it first accepts an integer n ($1 < n \leq 20$) which represents the number of students in a class (*note: you should change the size of the array to accommodate a total of 20 numbers*). For each student, read the student's mark m ($0 < m \leq 50$) and store them into the array.

After all marks are read, the average mark (*to 2 decimal places*) and the bar chart of the marks are printed. You may assume that all the input are valid (i.e. correct data type and the integers are within the valid range).

Example input and output:

```
Number of students? 3
Student 1: 30
Student 2: 20
Student 3: 50
Average = 33.33
*****
*****
*****
```

NOTE: The underlined number is user input, you do not need to print it again

Hint1: you need a variable to store the total mark (and probably the average mark).
What is the type of average? Is it [int](#)?

Hint: Be careful when performing division. What is the answer of $100/3$?
Is it the same as $100.0/3$?