Higher Diploma in Information Technology

Introduction to Programming (C++)

Year 1 Semester 1 – 2024

Tutorial 07 – Advanced Programming Techniques- Array Processing in C++ I

1. Various software companies charge various prices to implement systems based on their experience and skill. The flowing figure illustrates the amounts bid by 10 software companies (A-J) to implement a corporate web site.

   Note: The amounts are in millions.

Software Company	A	B	C	D	E	F	G	H	I	J
Bid	10	8	15	14	12.5	11	9.8	9.6	11	10.5

   Write a C++ program to read and store above figures in one dimensional array. It should calculate the average bid and count how many companies have bid less than the average bid.

2. Write a C++ program to complete following tasks:
   - Declare a one-dimensional array to store 10 integer numbers.
   - Get user input to load the array and print the values stored in an array.
   - The program should replace all even numbers by 0 and odd numbers by 1.
   - Count and print number of odd values and even values in an array.
   - Finally print the array elements after replacing the values with 1 and 0.

3. Write a C++ program to do the followings,
   a) Create a char array with size 7.
   b) Accept 7 characters and fill the array.
   c) Count number of vowels in the array.

```
Sample Output:
Enter 7 characters: o c t o p u s
The Number of vowels: 3
```

4. Table 1 shows the marks scored by students for the subject mathematics. Write a program to complete part a to h.

Array index	0	1	2	3	4
Student	A	B	C	D	E
Marks	10	25	23	100	45

Table 1 : Marks

a) Declare a one-dimensional array of size 5.

b) Ask user to enter values to fill the array.

c) Find and print the total value of the marks

```
Output: Total marks = 203
```

d) Find the highest mark and print

```
Output: Highest marks = 100
```

e) Find the Minimum mark and print

```
Output: Minimum marks = 10
```

f) Find and print the array index which has the highest mark

```
Output: Array index of the highest marks = 3
```

g) Find and print the name of the student who has got the highest mark

```
Output: Student D has taken the highest marks for mathematics
```

h) Find and print the Grade of each student using following scale.

Marks	Grade
0 - 44	F
45 – 64	C
65 - 84	B
85 - 100	A

5. Write a C++ program to complete following tasks:

'Program Design' subject is evaluated using one assignment and a written exam. There are 10 students in a batch. The lecturer needs to do the following with the marks of these 10 students:

- Declare 2D array and enter and store of assignment and written exam marks.
- Find the highest assignment mark and the highest written exam mark.