Higher Diploma in Information Technology

Introduction to Programming (C++)

Year 1 Semester 1 – 2024

Tutorial 10 – Structures in C++

Question 01

a) Create a structure called **Rectangle** that includes length (float) and width (float).

b) In the main method,

- Declare a variable of struct type.
- Get the width and height of the rectangle as user input.
- Calculate and print the area and the perimeter of rectangle using length and width.

```
Enter the length of Rectangle : 20
Enter the width of Rectangle : 10
The Perimeter of Rectangle : 60
The Area of Rectangle : 200
```

Question 02

a) Create a structure called **Exam** that includes exam ID (string), name of the subject (string), registration fee (double) and the number of students registered during a week (7 days) (int array).

b) Write a function called **getExamDetails( )** which is the data type of Exam that reads the details of Exam and store them in the variable of the Exam structure.

```
Exam getExamDetails (Exam e);
```

c) Write a function called **calExamFee()** which takes three parameters, registration fee for the exam, the number of students registered during a week (7 days) array and the size of the array. Find the total exam registration fee during the week and print the total exam registration to the screen.

d) Call the getExamDetails( ) and calExamFee( ) functions in the main function to print the following output as required.

```
Enter Exam ID:IT1101
Enter the Subject Name:IP
Enter the Registration Fee:2500.00
Enter the number of students Registred per day 1 : 3
Enter the number of students Registred per day 2 : 2
Enter the number of students Registred per day 3 : 6
Enter the number of students Registred per day 4 : 9
Enter the number of students Registred per day 5 : 4
Enter the number of students Registred per day 6 : 8
Enter the number of students Registred per day 7 : 1

Total Registration Fee:82500
```

Question 03: Write a C++ Program do the complete the following tasks.

- Create a typedef called Vehicle, that includes VehicleID (string), Model (String), Brand (String), price derivation of last 5 months (double array – size 5).
- Write a code segment in the main function, which takes the details of Vehicle as a user input and store them in the variable of the Vehicle typedef.
- Write a function called **avgDerivation()** which takes two parameters, price derivation of last 5 months array and the size of the array. The function should calculate and print the Payment in US Dollars (Assume USD 1 = LKR 180.00). and total payment in US Dollars for last 5 months.
- Call the **avgDerivation()**function in the main function to print the following output as required.
- In the main function change the Brand name of the Vehicle into "Audi" using pointers dynamically and print the new Brand name to the screen.

```
Enter the Vechicle ID : CAH-3368
Enter the Vechicle Model Name : M3456
Enter the Vechicle Brand Name : Honda
Enter the price in LKR - Month1 : 50000
Enter the price in LKR - Month2 : 75000
Enter the price in LKR - Month3 : 90000
Enter the price in LKR - Month4 : 60000
Enter the price in LKR - Month5 : 80000
Payment of Month1 in USD : 277.778
Payment of Month2 in USD : 416.667
Payment of Month3 in USD : 500
Payment of Month4 in USD : 333.333
Payment of Month5 in USD : 444.444

The Total Payment in USD : 1972.22

The Vechicle Brand Name : Audi
```