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## Higher Diploma in Information Technology



### Introduction to Programming (C++)

Year 1 Semester 1 – 2022

#### Tutorial 10 – Structures in C++

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##### 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 length and width 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 Registered per day 1 : 3
Enter the number of students Registered per day 2 : 2
Enter the number of students Registered per day 3 : 6
Enter the number of students Registered per day 4 : 9
Enter the number of students Registered per day 5 : 4
Enter the number of students Registered per day 6 : 8
Enter the number of students Registered 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
```