



UNIVERSITI TEKNOLOGI MALAYSIA

Assignment 1

SEMESTER 2 2019/2020

SCSJ2013 - Data Structures and Algorithms

Given the following class definition for **Customer** and functions prototype in Program 1-B, answer all questions in this section.

```
1  class Customer {
2      private:
3          string name; // customer name
4          string status; // customer status : member or nonmember
5          double parkingCharged; // amount charged for parking
6          int parkHour; // total hours taken for parking
7
8      public :
9
10         string getName()
11         { return name; }
12
13         int getHour()
14         { return parkHour; }
15
16         string getStatus()
17         { return status; }
18
19         double getCharged()
20         { return parkingCharged; }
21
22         void readValue();
23         void calcParkingCharges();
24     };
25 void displayInfo(Customer[]);
26 main()
27 {
28     Customer cust[20];
29     for (int i=0;i<20;i++)
30     { cust[i].readValue();
31       cust[i].calcParkingCharges();
32     }
33     displayInfo(cust);
34 }
```

```

21
22 } // end main()

```

Program 1-B.

- Draw the complete UML diagram for the class definition in Program 1-B.
- Write the complete function definition for the **readValue()** function. The function will initialize **name**, **parkHour** and **status** for the customer instance. You can read values from file.
- Write the complete function definition for **calcParkingCharges()**. The function will calculate the parking charge for each customer based on the criteria stated in the table below.

The criteria for Parking Charged are as follows:

Member	No charge for the first 2 hours, and RM1.00 for every other parking hour. Example : 2 hours, Parking Charged is RM0.00 6 hours, Parking Charged is RM4.00
Non-member	RM1.50 for every hour parked and RM50.00 if the car has been parked for 20 hours and more. Example : 2 hours, Parking Charged is RM3.00 6 hours, Parking Charged is RM9.00 21 hours, Parking Charged is RM50.00

- Write the complete function definition for the **displayInfo()** function. The function will display the information of all customers in the array, such as the customer name, the status and parking information, the parking duration and total charge for the parking. You need to use the sample output in the figure below to print the information.

```

Welcome Mr. Lim, You are a member
You will get free parking for the first two hours,
Your Parking duration : 2 hours
Your Parking Payment : Rm 0.00

Welcome Sarah Ali, You are not a member
You will be charged RM 50.00 for parking more than 20 hours
Your Parking duration : 2 hours
Your Parking Payment : Rm 3.00

```

Sample OUTPUT

Modify the Program and add the following:

- Add function to sort customers based on the parking hours.

- f. Add function to search certain customer and display
- g. Add menu that allow user to do
 - 1. Sort 2. Search 3. Display() 4. Exit

NOTE : This Assignment can be done in group of 2 students.

Submission Date : 2 May 2020