Problem 1:

Let, you are assigned to develop a software to manage the regular information of office employees, where an office has two types of a regular employees

- Supervisor
- Manager

For these supervisors, you have to manage few attributes, like their:

- name
- pay rate

and some functionalities, like:

- initializing the supervisor
- getting the supervisor 's attribute/s (e.g., name)
- calculating the supervisor's pay [Where pay amount is the product of hours worked and pay rate]

On the Other hand, managers are like supervisors; however, there might be differences. For example, they might be paid by a fixed salary which is independent of **total working hours**. Now, define necessary classes with appropriate members. However, all member variables should be defined as **protected**.

Problem 2:

Consider a University named "X" consisting of several departments where any department has the following attributes.

Each department offers a total of 30 courses in a semester, where each course is recognized by its course title and credit hour. However credit hour of any course is always greater than 0.0 but less than or equal 4.00.

Any department may needs to exercise the following behaviors:

- Setting or updating the course title and credit hour for all the offered courses.
- Calculating the total credit hours need to be conducted at any semester.

Your task is to design a class named "**Department**" considering all the requirements mentioned above. To accomplish the task you must overload the default constructor and declare all the member variables of "**Department**" classes private.

Problem 3:

Every year IUT organizes an admission test for recruiting eligible students amongst many potential candidates for a 4-year bachelor's programme. In the coming year IUT has a plan to develop an online registration portal for potential candidates. You are now assigned to develop a little portion of this project. Requirements for your task are described below.

Each candidate has his own examination id, mobile phone number,very recent two (2) public examination marks and a pre-admission merit position amongst all the candidates. Pre-admission merit

position of any candidate will be assigned automatically by the system based on his aggregate marks obtained at the previous two (2) public examinations. However each public examination marks will be considered out of 1000. Candidate will just provide his public examination marks.

Any candidate can set or update his mobile phone number but not his examination id, where each examination id will be assigned automatically when a candidate is registered and it will be assigned in ascending order starting from 1. For example, a candidate who applied at the very beginning at an online registration portal will be assigned an examination id 1. If a total of 500 candidates have just applied then the candidate who applied very last will be given an examination id 500. It is to be noted that the examination id of any candidate can never be changed once it is assigned.

Beside the above attributes, each candidate can also check the total number of candidates already registered for this admission test. In addition to this privilege each candidate also can find out the highest aggregate marks obtained amongst all the examinees' aggregate mark.

Considering all the above specifications of candidates now design a candidate class and create a few objects of its own to check the workability of the class member functions.

Problem 4:

An Airline agency maintains 10 flights from Dhaka. Whereas each flight is associated with a unique flight number, maximum passenger carrying capacity and a destination city. Distance to the destination city from Dhaka is crucial information needed to be provided by the airline agency to calculate the amount of fuel required. However every flight from this airline can carry a maximum of 2000 liters of fuel at a time. Whereas the required amount of fuel for any flight is 0.25 times the distance it travels. Thus if a flight needs to travel 2000km then 500 liter fuel must be loaded.

Define the following classes named

- Airline
- Flight

With suitable member functions and variables. However every member variable must be declared under private access modifier and class definition should include suitable constructor(s), set and get function for setting and returning class member variables respectively.

A member function of airline class named setInfo() should allow the agency to enter inputs for respective flights. Flight number and fuel required should be determined automatically based on predefined policy. Flight number will be assigned in ascending order starting from one (1). A member function of airline class named ShowInfo() should allow the agency to view the status of all flights. Each flight must include a private method to verify the amount of required fuel. If the fuel required is much higher than its maximum fuel carrying capacity, then appropriate warning message should be flagged.

Problem 5:

Inter-department cricket matches are arranged every year in IUT. However, the student community has just planned to offer an online scoreboard for the remote viewers in the coming year. You are given the responsibility to develop a simple version of online scoreboard to present the scores of any cricket matches. However, a cricket match always deals with two teams, each team consisting of 11 players. Each player's individual achievement contributes to his respective team score. Let, You need to handle only the player's run which collectively contributes to the team score. Thus, only the player's name and their individual runs scored should be stored.

Each team has a name and a team should also keep track of "highest scorer" within their own team members.

A cricket match should identify and store the winning team name and match result. However, a single player among contending teams should be declared as "man of the match" in a cricket match. Selection of "man of the match" is based on total run scored.

Now, define necessary classes with appropriate member variables and functions to meet aforementioned requirements. However, all member variables should be defined as private.

Problem 6:

Create a class called "myString" with appropriate constructor (s). The class has a member of char pointer which points to the memory containing a sequence of characters. However, you have to overload the necessary operators for myStringclass to tackle the following expressions:

```
s1=s1 + s2 ;
s1= "iut" + s2;
s1 += s2;
if( ! s1) cout<<"Empty string";
cout << s1[2];
cout << s1;
```

Where s1 and s2 are objects of the myString class.

Islamic University of Technology

Assignment 01

Name:
Student ID:
Submission Date:

Semester : Winter
Academic Year: 2019-2020
Course Code: CSE 4301
Course Title: Object Oriented Programming
Submitted To: Faisal Hussain