**Concept of Objects and Classes**

**Introduction**

Object consists of the data and the functions that operate on the data. Object data is usually private: no functions other than those within the same object can access it. On the other hand, the functions within the object are usually public. They can be accessed by the other functions in the program including the functions in the other objects. So the function in one object can access the data in the other object through the function of that object.

In object-oriented programming, objects are variables of classes. It is a specification for any number of objects based on that class. A class itself is a template (data type) for objects. When we actually define the object, of a class we are requesting to allocate memory for that object to hold its data. Classes are actually user-defined data types.

The data items within a class are called data members. There can be any number of data members in a class. Normally, data members follow the keyword private, so they can be accessed from within the class but not from outside. That is why we say that OOP has the feature of data hiding. So, it is safe from accidental alteration.

**Objectives**:

* Create class, and define attributes and methods
* Define objects of a class
* Call the class members using objects.

Member functions are functions that are included within a class. Let's see a class example:

*class demo*

*{*

*private:*

*int rollno; //data member*

*float score; //data member*

*public:*

*setdata( int rl, float sc) //member function*

*{rollno=rl; score=sc;}*

*setdata( )*

*{*

*cout<<"Enter the roll no: \n";*

*cin>>rollno;*

*cout<<"Score: \n";*

*cin>>score;*

*}*

*showdata( ) //member function*

*{*

*cout<<"\Roll No: " <<rollno<<"has scored "<<score<<endl;*

*}*

*};*

Now, after reading carefully the above class. Go throw the following exercises:

1. Add a function member to demo class. The function takes two integers and swap them and print the output. The name of function is swap.
2. Write the main function and define two objects of the demo class. For each object call all function members in the demo class.

**Exercises:**

1. Create a class called carpark that has int data member for car id, int data member for charge/hour, and float data member for the parked time. Make functions to set data members and show the charges and parked hours of the corresponding car id. Make functions for setting and showing the data members. Member function should be called from other functions.
2. Assume that an object represents an employee report that contains information like employee id, total bonus, total overtime in a particular year. Use an array of objects to represent *n* employees' reports. Write a program that displays the report. Use setpara() member function to set report attributes by passing the arguments and member function displayreport() to show the report according to the parameter passed. Display the report in the following format.

*An employee with ... ... ... has received Rs ... ... ...as a bonus*

*and*

*had worked ... ... ... hours as overtime in the year ... ... ...*

1. Write a simple program that converts the temperature in Celsius scale to Fahrenheit scale and vice versa using the basic concept of class and object. Make separate classes for Celsius and Fahrenheit which will have the private members that hold the temperature value and make conversion functions in each class for conversion from one to another. For example, you need to have a function to Fahrenheit() in class Celsius that converts to Fahrenheit scale and returns the value.

That is the end of labsheet.. Good Luck