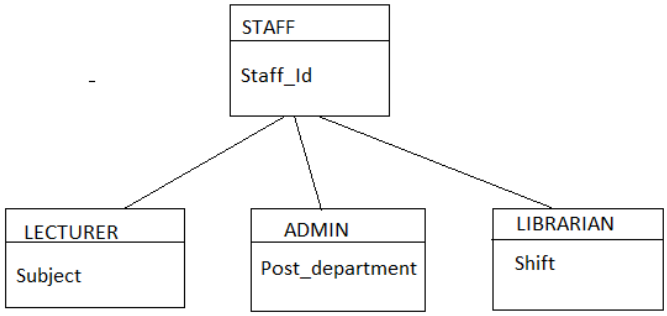
Object Oriented Programming Manual

1. **Introduction to Classes and Objects**
    a) Write a program to calculate the area and perimeter of a rectangle by using the concept of OOP.
    b) Write a program to calculate the distance between two points using the concept of OOP.
    c) Write a program to read two numbers from user and display the largest number using the concept of OOP.
2. **Functions in C++**
    a) Write a program to find the volume of cube, cylinder and rectangular box by suing the concept of function of overloading.
    b) Write a program to display n characters by using default arguments for all parameters. Assume that the function takes two arguments (one character to be printed and other number of characters to be printed).
    c) Assume that employee will have to pay 10 percent income tax to the government. Ask user to enter the employee salary. Use inline function to display the net payment to the employee by the company.
    d) Write a function that passes two temperatures by reference and sets the larger of the two numbers to 100 by using return by reference.
    e) WAP to find the sum and average of the number by using new and delete operator. Also use static_cast casting operator.

3. **Constructor**
    a) Write a program that display the total time in 24-hour clock format having fixed time 12:34:56 and 10:35:14. One constructor should initialize member data hour, minute and second to 0 and another should initialize it to fixed values. Other two member functions should add two objects of type time passed as arguments and display the result.
    b) WAP to perform the addition of distance in the feet and inches format. Use objects as argument.
    c) Create a class first with data member data1 and another class second with data member data2. Display the largest number. Use friend function.
    d) Write a simple program that convert the temperature in degree centigrade to degree Fahrenheit and vice-versa using the basic concept of classes and objects. Make separate class for centigrade and Fahrenheit which have the

private member to hold the values and add conversion function in each class from centigrade to Fahrenheit**.**

4. **Operator Overloading**
   a) WAP to show operator function returns object of type complex.
   b) WAP to overload an increment operator (++) in prefix notation.
   c) WAP to overload unary minus operator using friend function.
   d) WAP to overload plus operator to add two complex number using friend function and without using friend function.
5. **Operator Overloading(Data Type Conversions)**
   a) WAP to convert hour into object of a class Time which has minute and second as members.
   b) WAP to convert Time expressed in minute and second into single value hour.
   c) Create a class named Centigrade and another class name Fahrenheit. Write a program to convert object of Centigrade class into object of another class Fahrenheit.
      i. Define the conversion routine in source class.
      ii. Define the conversion routine in destination class
      (For centigrade to Fahrenheit conversion, multiply by 9, then divide by 5, then add 32).
6. **Inheritance**
   a) Write a program to illustrate single, multiple, multilevel, hierarchial inheritance.
   b) Develop a complete program for an institution, which wishes to maintain a database of its staff. The database is divided into number of classes whose hierarchical relationship is shown in the following diagram. Specify all the classes and define constructors and function to create database and retrieve the individual information as per the requirement.



c) Write a program to find the area of a rectangle by passing length and breadth as arguments after creating member function in both derived and base class with the same name.
d) Write a program to show the use of virtual base class and pure virtual function.