**Lab-Work 01**

1. Write a C++ program for function to calculate the factorial value of any integer as an argument. Call this function from main( ) and print the results in main( ).
2. Write a C++ program for function that receives two numbers as an argument and display all prime numbers between these two numbers. Call this function from main( ).
3. Write a C++ program that lets the user perform arithmetic operations on two numbers. Your program must be menu driven, allowing the user to select the operation (+, -, \*, or /) and input the numbers. Furthermore, your program must consist of following *function*s:  
   -*Function* showChoice: This *function* shows the options to the user and explains how to enter data.  
   - *Function* add: This *function* accepts two number as arguments and returns sum.  
   - *Function* subtract: This *function* accepts two number as arguments and returns their difference.  
   - *Function* multiply: This *function* accepts two number as arguments and returns product.  
   - *Function* divide: This *function* accepts two number as arguments and returns quotient.
4. Write a C++ program that define for a class called **Distance** that has data member feet as integer  and inches as float. The class has the following member functions:  
   **void set(int, float)** to give value to object  
   **void disp()** to display distance in feet and inches  
   **Distance add(Distance)** to sum two distances & return distance  
   - Write the definitions for each of the above member functions.  
   - Write main function to create three Distance objects. Set the value in two objects and call add() to calculate sum and assign it in third object. Display all distances.
5. Write a C++ program that define for a class called **time** that has hours and minutes as integer. The class has the following member functions:  
   **void settime(int, int)** to set the specified value in object  
   **void showtime()** to display time object  
   **time sum(time)** to sum two time object & return time  
   -Write the definitions for each of the above member functions.  
   - Write main function to create three time objects. Set the value in two objects and call sum() to calculate sum and assign it in third object. Display all time objects.

**Lab-Work-02**

**Friend Class**

1. [Write a C++ program to find total and average marks of each student in class. Create a student class with student number, name, six course marks as its members and initializes the details. Use friend class that access the details of student and calculates total, average marks and prints the result.](http://eduwing.blogspot.in/2013/12/average-marks-of-students-using-friend.html)
2. Write a C++ program to find the total cost of book in a library.

* Declare class RefBooks as friend in class TextBooks.
* Declare method in class RefBooks with object of class TextBook as a parameter.

1. [Write a C++ program to calculate bonus of the employees. The class master derives the information from both admin and accountclasses which intern derives information from class person. Create base and allderived classes having same member functions called getdata, display data andbonus. Create a base class pointer that capable of accessing data of any classand calculates bonus of the specified employee. Use Friend class to solve the problem.](http://eduwing.blogspot.in/2013/12/calculate-bonus-of-employee.html)
2. Write a C++ program that adding of members of two different classes using friend function.

**Friend Function**

1. Write a C++ program to compare two time objects. Develop a method is\_later to decide whether time t1 is greater than time t2.

For example: Time set t1 : 12:12:12

Time set t2 :13:13:13

Time t2 is greater than t1

1. [Write a C++ program to find the given string is palindrome or not. Declare private member function to find palindrome of the given string and access it using friend function.](http://eduwing.blogspot.in/2013/12/palindrome.html)
2. [Write a C++ program to calculate gross and net pay of employee from basic salary. Create employee class which consists of employee name, emp\_id, and basic salary as its data members. Use parameterized constructor in the derived class to initialize data members of the base class and calculate gross and net pay of the employee in the derived class.](http://eduwing.blogspot.in/2014/03/use-parameterized-constructor-in.html) (Use friend function to implement this program).
3. Write a C++ program that multiply a 2D matrix using friend function.

**Lab-Work-03**

**Inheritance:**

1. Design a class student with data members roll, name and age. Use three arguments constructor to initialize student object, and also use member function to read and display student detail. Also design a class foreignstudent that inherits student with its own data member country. Use member function to display detail of foreign student.  
   Write a main program to test above implementation.

## Design a program as specified below:  i.  Design a class student with data members roll and name, and two-member function to read and display data members.  Ii.  Derive a class exam from student with its own data members to stores marks in three subjects and member function to read and display marks.  Iii.  Design a third class result that inherits class exam, with its own data member total and member function display() to display roll, name, marks and total.

## Write a program as specified as below: i.  Design a class staff with data member staff\_id and level, and member function to read display detail of staff. Ii.  Also design another class teacher with data members teacher\_id, subject and member function to read and display detail of teacher.  Iii. Again, design another class coordinator that inherits teacher and staff with own data member program. Use member function to read and display detail of coordinator. Design a main program to test above design.

## Write a program as specified below:  a. Design a class student with data members roll and name, and two-member function to read and display data members. b. Derive a class exam from student with its own data members to stores marks in three subjects and member function to read and display marks. c. Derive another class sport from student with its own data member score in sport and function to read and display score. d. Design another class result from exam and sport, with its own data member total and average, and member function compute () to compute total and average and display () to display detail.

## Imagine a publishing company that markets both book and audio cassette version of it works.  Create a class publication that stores the title and a price of a publication. From this class derive twpclasses : book, which adds page count, and a tape, which adds a time in minutes. Each of these three classes should have a getdata() function to get its data from user at the keyboard, and putdata()  function to display its data. In the base class these member functions have to be defined as virtual functions. Write a main program models the class hierarchy for the company and processes objects of these classes using pointers the base class.

**Lab Work - 4**

**1**. Write a C++ class, SalaryAccount, which contains the following (private) attributes and (public) member functions.

Attributes:

1. Emp\_id, must be 3 digit
2. Emp\_name, full name of the employee
3. Designation, job position of the employee at the organization
4. Basic\_pay, should not be negative
5. House\_allowance,*30% of Basic pay*
6. Medical\_allowance, 20% of Basic pay
7. *Transportation allowance, 20% of Basic pay*

Methods/Functions:

1. A default constructor that will create a SalaryAccount of Emp\_id 101, Emp\_name Nazim Uddin, Designation Manager, Basic\_pay 15000.
2. A constructor with parameters for Emp\_id, Emp\_name, Designation, Basic\_pay .
3. A method called Calculation()-calculates all the allowances for an employee.
4. A method called Display()-displays all the information of the employee, such as Employee name, Employee id, Designation, Basic salary, House allowance, Medical allowance, Transportation allowance and total salary of the employee.

Write the main function with the bellow steps-

1. Initiate a salary account, Emp1 by passing four parameters accordingly
2. Call calculation method to calculate the allowances
3. Call display method to display account details
4. Initiate another account Emp2, without passing any parameter
5. Call calculation method to calculate the allowances
6. Call display method to display account details

**2**. Write a program in C++ to find out the area of polygons. In your program you will have a class called Polygon. In Polygon class you will have three different methods with the same method name. The first method will calculate and display the area of a circle, the second method will calculate and display the area of a square and the third function will calculate and display the area of a triangle.