1. Write an inheritance hierarchy for classes Quadrilateral, Trapezoid, Parallelogram, Rectangle and Square. Use Quadrilateral as the super class of the hierarchy. Specify the instance variables and methods for each class. The private instance variables of Quadrilateral should be the x-y coordinate pairs for the four endpoints of the Quadrilateral. Write a program that instantiates objects of your classes and outputs each object's area (except Quadrilateral).

2. Create a general class ThreeDObject and derive the classes Box, Cube, Cylinder and Cone from it. The class ThreeDObject has methods wholeSurfaceArea ( ) and volume ( ). Override these two methods in each of the derived classes to calculate the volume and whole surface area of each type of three-dimensional objects. The dimensions of the objects are to be taken from the users and passed through the respective constructors of each derived class. Write a main method to test these classes.

3. Write a program to create a class named Vehicle having protected instance variables regnNumber, speed, color, ownerName and a method showData ( ) to show "This is a vehicle class". Inherit the Vehicle class into subclasses named Bus and Car having individual private instance variables routeNumber in Bus and manufacturerName in Car and both of them having showData ( ) method showing all details of Bus and Car respectively with content of the super class's showData ( ) method.

4. An educational institution wishes to maintain a database of its employees. The database is divided into a number of classes whose hierarchical relationships are shown below. Write all the classes and defines the methods to create the database and retrieve individual information as and when needed.

   Write a driver program to test the classes.

   Staff (code, name)
   Teacher (subject, publication) is a Staff
   Officer (grade) is a Staff
   Typist (speed) is a Staff
   RegularTypist (remuneration) is a Typist
   CasualTypist (daily wages) is a Typist.

5. Consider an example of book shop which sells books & video tapes. It's modeled by Book & Tape classes. These two classes are inherited from the abstract class called Media. The Media class has common data members such as title & publication. The Book class has data member for storing a no. of pages in a book & Tape class has the playing time in a tape. Each class will have method such as read ( ) & show ( ). Write a program that models this class hierarchy & processes objects using reference to base class only.

6. Assume that a Bank maintains two kinds of accounts for its customers, one called savings account and the other current account. The savings account provides compound interest and withdrawal facilities. The current account provides no interest. Current account holders should maintain balance and if the balance falls below this level, a service charge is imposed.
    - Create a class Account that stores customers name, account number and type of the account. From this derive the classes CurAccount and SavAccount to make them more specific to their requirements.
    - Include the necessary methods in order to achieve the following tasks:
        Assign initial values
        Accept deposit from a customer and update the balance
        Permit withdrawal and update the balance
        Compute and deposit interest
        Check for the minimum balance, impose penalty, if necessary, and update it.
        Display the balance
    - Write a program that creates an array of Bank Account and displays a menu that lets a new account to be created, perform deposit and withdrawal transactions on the basis of account number, display the balance of account holder for whom the account number is provided.