1. Create three interfaces, each with two methods. Inherit a new interface from the three, adding a new method. Create a class by implementing the new interface and also inheriting from a concrete class. Now write four methods, each of which takes one of the four interfaces as an argument. In main( ), create an object of your class and pass it to each of the methods.

2. Create an interface with at least one method, in its own package. Create a class in a separate package. Add a protected inner class that implements the interface. In a third package, inherit from your class and, inside a method, return an object of the protected inner class, up casting to the interface during the return.

3. Create a private inner class that implements a public interface. Write a method that returns a reference to an instance of the private inner class, up cast to the interface. Show that the inner class is completely hidden by trying to downcast to it.

4. Create an interface Department containing attributes deptName and deptHead. It also has abstract methods for getting data and printing the attributes. Create a class hostel containing hostelName, hostelLocation and numberofRooms. The class contains methods for getting and printing the attributes. Then write Student class extending the Hostel class and implementing the Department interface. This class contains attributes studentName, regdNo, electiveSubject and avgMarks. Write suitable getData and printData methods for this class. Also implement the abstract methods of the Department interface. Write a driver class to test the Student class. The program should be menu driven containing the options:
   i) Admit new student
   ii) Migrate a student
   iii) Display details of a student

   For the third option a search is to be made on the basis of the entered registration number.

5. Complete the following:
   i) Create a package named org.shapes.
   ii) Create some classes in the package representing some common geometric shapes like Square, Triangle, Circle and so on. The classes should contain area and perimeter methods in them.
   iii) Compile the package.
   iv) Use this package to find area and perimeter of different shapes as chosen by the user.