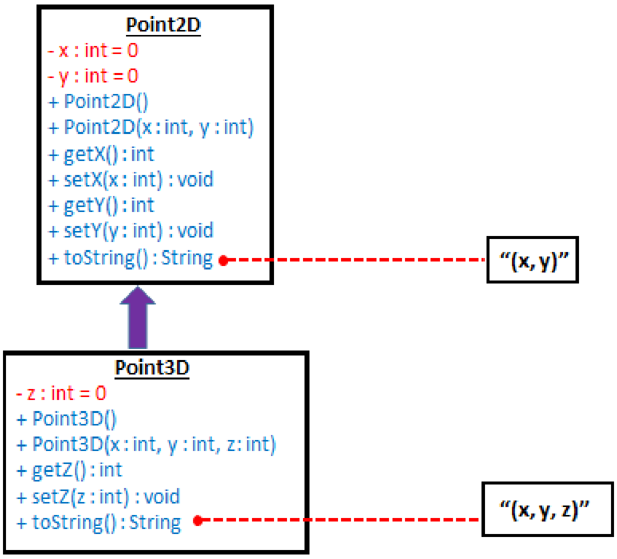
Object Oriented Programming using Java

Assignment - 5

Inheritance & Polymorphism

1. Define a class Person with properties name and dob (String) and a member function personDetails() to display the details of a person. Create a subclass Employee with an additional property comapnyName and employeeId and a method employeeDetails() to display employee details. Create objects of both Person and Employee class and display their details.
2. Create class called Rectangle with two data members length and breadth and two member function inputData(), to initialize the data and area() to compute the area of a rectangle. Create a subclass called Square with one data member called length and overrides both the methods of the Rectangle class. Create object of both the class and display their areas.
3. Create a class Point2D with the data member and methods shown in the class diagram. Note that the items with a minus sign (-) indicate private members and items with a plus sign (+) indicate public members. Create a subclass called Point3D which is derived from the superclass Point2D. Test the methods of both the classes by creating objects in the main method of another class.



4. Design an employee hierarchy with multiple levels of inheritance. There are three types of employees: Employee (base class), Manager (inherits from Employee), and Director (inherits from Manager). Each employee has a name, employee ID, and a method to display their details. You can use constructor or setter methods to initialize the data members.

   Data Members:

   - Employee: name (String), employeeId (int)
   - Manager: teamSize (int)
   - Director: department (String)

   Member Functions:

   - Employee: displayDetails()
   - Manager: displayDetails() (overrides the base class method)
   - Director: displayDetails() (overrides the manager's method)

5. Develop an online shopping system with hierarchical inheritance. Create a base class Product and two derived classes Electronics and Clothing. Each class should have specific properties and methods. You can use constructor or setter methods to initialize the data members.

   Data Members:

   - Product: productName (String), price (double)
   - Electronics: brand (String), warrantyPeriod (int)
   - Clothing: size (String), material (String)

   Member Functions:

   - Product: displayDetails()
   - Electronics: displayDetails()
   - Clothing: displayDetails()