Practical 05: Encapsulation & Inheritance

Exercise 01:

Recall the following scenario discussed during the class. Develop a code base to represent the scenario. Add a test class to invoke Lecturer and Student class by creating atleast one object from each.

Note: All the common attributes and behavior stored in the super class and only the specific fields and behavior stored in subclasses.

Student
- name
- id
- course
+ setName()/getName()
+ setID()/getID()
+ setCourse()/getCourse()

Lecturer
- name
- id
- programme
+ setName()/getName()
+ setID()/getID()
+ setProg()/getProg()

Person
Identify field and attributes to be stored in this class

```
public class Person {
  private String name;
  private int id;

  public String getName() {
    return name;
  }

  public void setName(String name) {
    this.name = name;
  }

  public int getID() {
        return id;
    }

    public void setID(int id) {
        this.id = id;
    }
}

class Student extends Person {
    private String course;

    public String getCourse() {
        return course;
    }

    public void setCourse(String course) {
        this.course = course;
    }
}

class Lecturer extends Person {
    private String programme;

    public String getProg() {
        return programme;
    }

    public void setProg(String programme) {
        this.programme = programme;
    }
}

class TestPerson {
    public static void main(String[] args) {
        Student s1 = new Student();
        s1.setName("Alice");
        s1.setID(1);
        s1.setCourse("Computer Science");
        System.out.println("Student Name: " + s1.getName());
        System.out.println("Student ID: " + s1.getID());
        System.out.println("Student Course: " + s1.getCourse());

        Lecturer l1 = new Lecturer();
        l1.setName("Bob");
        l1.setID(2);
        l1.setProg("Software Engineering");
        System.out.println("Lecturer Name: " + l1.getName());
        System.out.println("Lecturer ID: " + l1.getID());
        System.out.println("Lecturer Programme: " + l1.getProg());
    }
}
```

Exercise 02

Develop the following class execute and discuss the answer: Please note that each public class stored in separate files. Write down the answer.

```
public class Animal{}
public class Mammal extends Animal{}
public class Reptile extends Animal{}

public class Dog extends Mammal{
  public static void main(String args[]){
    Animal a = new Animal();
    Mammal m = new Mammal();
    Dog d = new Dog();
    System.out.println(m instanceof Animal);
    System.out.println(d instanceof Mammal);
    System.out.println(d instanceof Animal);
  }
}
```

Output

```
true
true
true
```