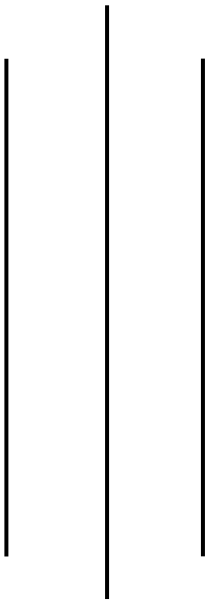
TRIBHUVAN UNIVERSITY

Central Department of Computer Science and Information Technology

Kritipur, Kathmandu, Nepal



OBJECT-ORIENTED SOFTWARE ENGINEERING (OOSE)

Assignment 1

Submitted By:

Priya Shrestha

Roll No: 24

Submitted To:

Prof. Dr. Subarna Shakya

Date: 2081/12/10

1. **Write an Object-Oriented programming language which includes objects, classes, instances, inheritance, polymorphism and information hiding features.**

Source Code:

```
import java.util.*;

// Base class Person
class Person {
   private String name;    // Information hiding
   private int age;

   // Constructor
   public Person(String name, int age) {
      this.name = name;
      this.age = age;
   }

   public String getName() {
      return name;
   }

   public int getAge() {
      return age;
   }

   public void displayDetails() {
      System.out.println("Name: " + name);
      System.out.println("ID: " + age);
   }
}

class Student extends Person {              //inheritance
   private String course;

   public Student(String name, int age, String course) {
      super(name, age);   // Calling constructor of the base class
      this.course = course;
   }

   @Override
   public void displayDetails() {
      super.displayDetails();     // Calling displayDetails of the base class
      System.out.println("Course: " + course);
   }

   public void study() {
```

```
        System.out.println(getName() + " is studying " + course + ".");
    }
}

class Teacher extends Person {  //Inheritance
    private String subject;

    // Constructor
    public Teacher(String name, String subject) {
        super(name, 0);
        this.subject = subject;
    }

    @Override
    public void displayDetails() {
        System.out.println("Name: " + getName());
        System.out.println("Subject: " + subject);
    }

    public void teach() {
        System.out.println(getName() + " is teaching " + subject + ".");
    }
}

public class Lab1 {
    public static void main(String[] args) {
        Scanner sc = new Scanner(System.in);

        System.out.print("Enter Student Name: ");
        String studentName = sc.nextLine();
        System.out.print("Enter Student Age: ");
        int stdAge = sc.nextInt();
        sc.nextLine();
        System.out.print("Enter Student Course: ");
        String stdCourse = sc.nextLine();

        // Create Student object
        Student student = new Student(studentName, stdAge, stdCourse);

        System.out.print("Enter Teacher Name: ");
        String teacherName = sc.nextLine();
        System.out.print("Enter Teacher Subject: ");
        String teacherSubject = sc.nextLine();

        // Create Teacher object
        Teacher teacher = new Teacher(teacherName, teacherSubject);

        // Polymorphism by calling the same method with different behaviors
```

```
        System.out.println("\nStudent Details:");
        student.displayDetails();
        student.study();

        System.out.println("\nTeacher Details:");
        teacher.displayDetails();
        teacher.teach();

        sc.close();
    }
}
```

Output: