Java Lab Assignments (Date of Assignment: 21/04/25)

1. Hello World Java Program.

Problem-1: Write and run your very first Java program that prints a message on the screen.

2. Using Class and Object in Java
Objective:
To understand how to define a class and create objects in Java.

Problem-1: Write a Java program that:

Creates a class called Student.

The class should have the following fields:
- name (String)
- rollNumber (int)
- marks (float)

Create a method displayInfo () to print the student's information.
In the main () method, create an object of the Student class, set values for its fields, and display the information.

Problem-2: Create a class Rectangle to calculate the area of a rectangle:

Fields: length, width
Constructors:
- Rectangle () : To initialize default values
- Rectangle () : To initialize parameterized values

Methods:
- calculateArea () : returns area
- displayDetails () : prints length, width, and area

3. Basic Concepts of OOP Properties in Java

Objective:
To understand and implement the core principles of Object-Oriented Programming: **Encapsulation, Inheritance**, and **Polymorphism** using Java.

Problem Statement:
Design and implement a simple **University Management System** that manages **Persons, Students, Professors,** and **Courses**. The program should demonstrate the use of inheritance, encapsulation, and polymorphism.

Instructions:
Encapsulation: Use private variables and public getters/setters.

Inheritance: Create a class hierarchy where Student and Professor inherit from a base class Person.
Polymorphism: Implement a method displayInfo() in the Person class and override it in subclasses.

Class Structure:

Class: Person (Base Class)
- Fields: name, age
- Methods: displayInfo(), getters and setters

Class: Student (Subclass of Person)
- Additional Fields: studentId, major
- Override: displayInfo()

Class: Professor (Subclass of Person)
- Additional Fields: employeeId, department
- Override: display Info()

Class: Course
- Fields: courseCode, courseName, professor, enrolledStudents
- Methods: Add/Remove student, display course info.

Sample Output

Student Info:
Name: Alice
Age: 20
ID: S1234
Major: Computer Science

Professor Info:
Name: Dr. Smith
Age: 45
Employee ID: E5678
Department: Engineering

Course Info:
Course: CS101 - Intro to Programming
Professor: Dr. Smith
Enrolled Students:
1. Alice