**Assignment 1**

1. Create a simple Swing application with the following components:

* A JTextField to accept a username.
* A JPasswordField to accept a password.
* A JButton for login.
* Display the entered username and password in a JLabel when the button is clicked.

2. Write a Java program to connect to a MySQL database. Create a table Employees with columns ID, Name, and Salary. Insert three records and fetch all records from the table.

**Assignment 2**

1. Create a program that uses a HashMap to store employee IDs and their names. Perform the following operations:

* Add five key-value pairs.
* Search for an employee by ID.
* Display all employees.

2. Create a program that reads employee details (ID, name, and salary) from a file and displays employees with a salary above a given threshold. And calculate and print average salary.

**Assignment 3**

1. Write a program to implement a custom exception called InsufficientBalanceException. Simulate a banking system where a user tries to withdraw money. Throw this exception if the withdrawal amount exceeds the current balance.
2. Write a program to create two threads:

* Thread 1 prints numbers from 1 to 10.
* Thread 2 prints "Hello" five times.
* Ensure both threads run concurrently.

**Assignment 4**

* The **diamond problem** occurs when a class inherits from two parent classes that share a common base class. This creates ambiguity about which version of a method to use.

In Java, this issue is avoided because **multiple inheritance is not allowed** with classes. However, it can occur when using interfaces. So using interface implement the following scenario:

**Base Class/ Interface**: Product (attributes: name, price; method: showDetails()).

**Derived Classes/Interfaces**:

Electronics: Adds warranty and overrides showDetails().

Clothing: Adds size and overrides showDetails().

**Child Class/Interface**: ElectronicsClothing inherits both Electronics and Clothing.

Imagine a hierarchical structure for a library system:

Base class: LibraryItem (attributes: title, author).

Subclasses:

Book (adds numberOfPages attribute).

Magazine (adds issueNumber attribute).

Write a program to demonstrate polymorphism using this hierarchy.

**Assignment 5**

A cinema hall has different ticket prices based on the type of seat:

* Regular: 150 INR
* Premium: 250 INR
* VIP: 500 INR

Write a code to calculate the total earnings from ticket sales in a day. The input will be an array/list where each element represents the type of seat booked by a customer.

Input:

['Regular', 'Premium', 'VIP', 'Regular', 'VIP']

Output:

Total earnings: 1550 INR

Create a Course class with private attributes: courseName, courseCode, creditHours, and instructor. Create an array of five Course objects and use constructors to initialize those objects. Write a static method getCoursesByCreditHours() in the Main class that takes an array of Course objects and a credit hour value as input, and returns a list of courses that match the given credit hours. Write the necessary getters to return the attributes.