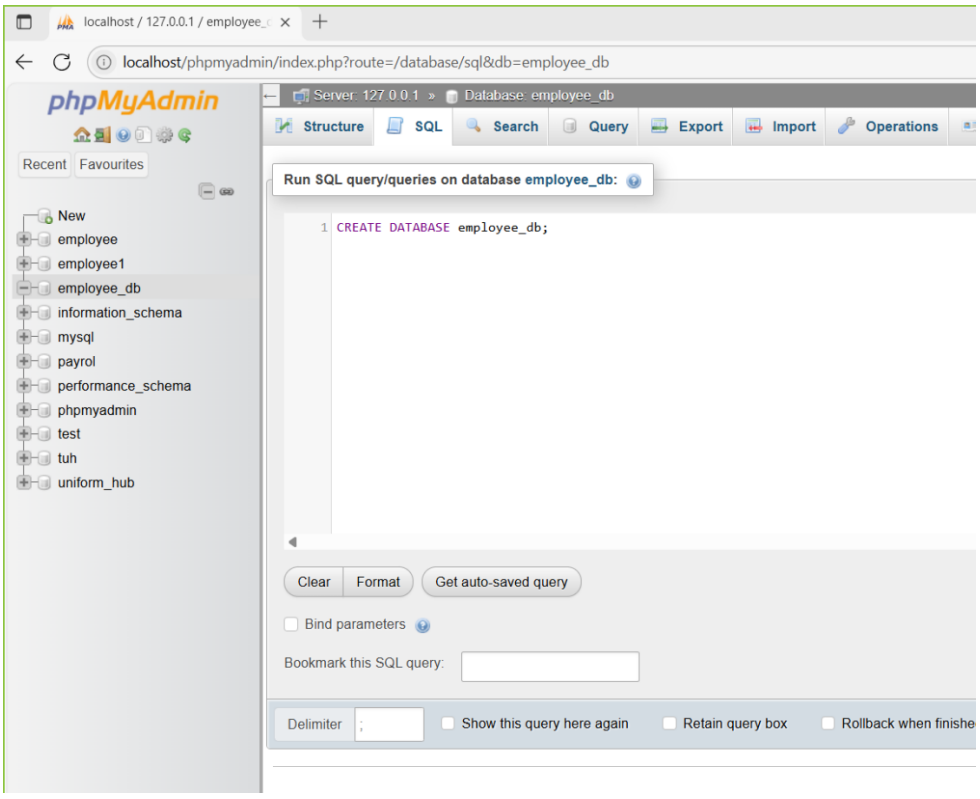
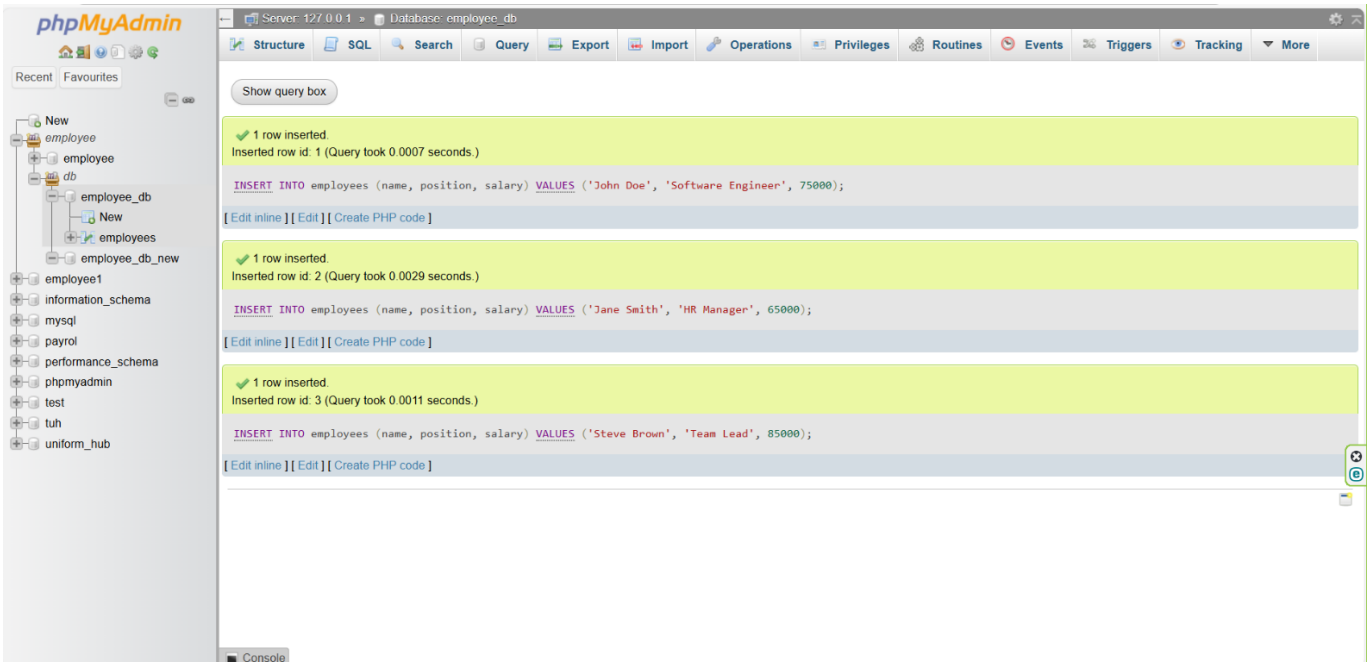
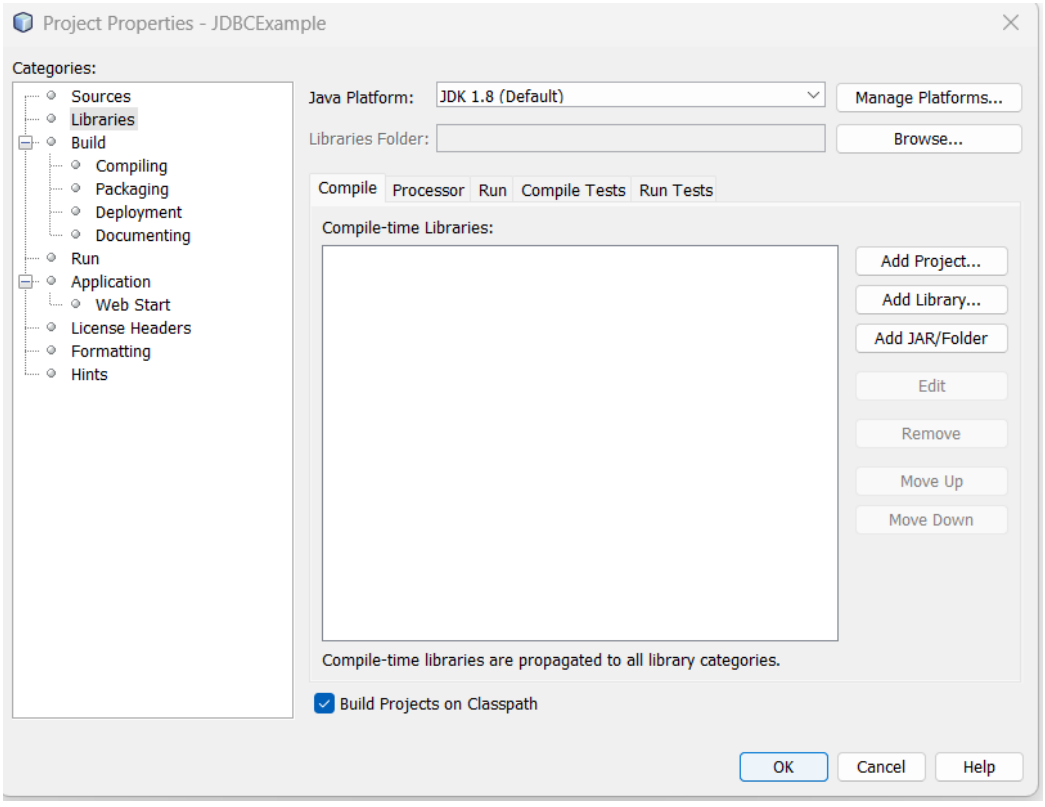
Lab Sheet 2 : Java JDBC

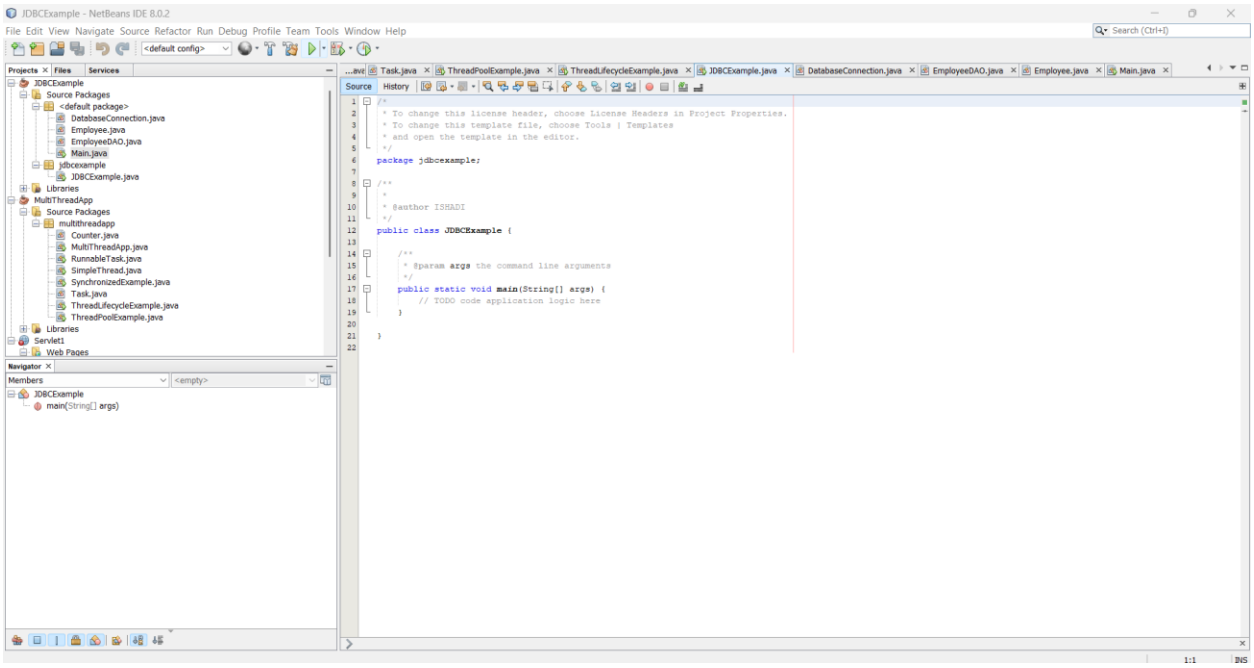
1. Set Up MySQL Database
   CREATE DATABASE employee_db;
   USE employee_db;
   CREATE TABLE employees (
   id INT PRIMARY KEY AUTO_INCREMENT,
   name VARCHAR(100),
   position VARCHAR(100),
   salary DECIMAL(10, 2)
   );
   INSERT INTO employees (name, position, salary) VALUES ('John Doe',
   'Software
   Engineer', 75000);
   INSERT INTO employees (name, position, salary) VALUES ('Jane Smith', 'HR
   Manager', 65000);
   INSERT INTO employees (name, position, salary) VALUES ('Steve Brown',
   'Team
   Lead', 85000);





2. Set Up NetBeans Project



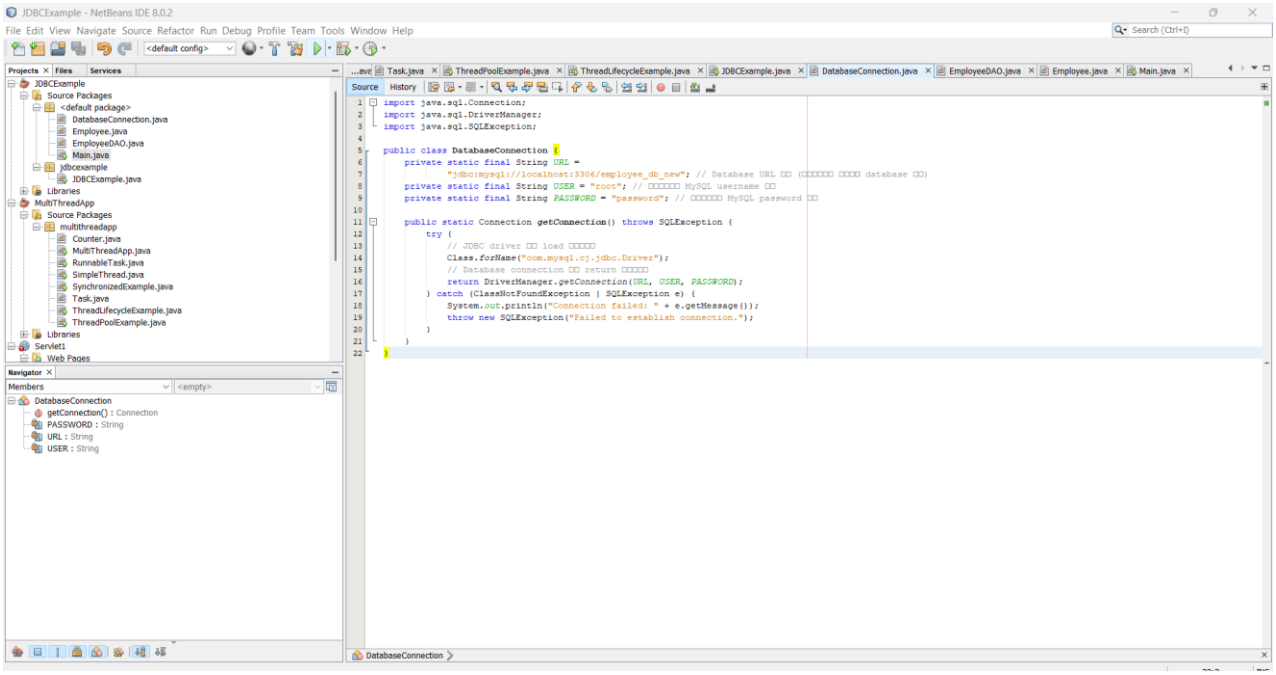


3. Establish JDBC Connection

- DatabaseConnection.java

```
import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.SQLException;


public class DatabaseConnection {

    private static final String URL =

            "jdbc:mysql://localhost:3306/employee_db";

    private static final String USER = "root";

    private static final String PASSWORD = "password";
```

```
    public static Connection getConnection() throws SQLException {
        try {

            Class.forName("com.mysql.cj.jdbc.Driver");

            return DriverManager.getConnection(URL, USER, PASSWORD);
        } catch (ClassNotFoundException | SQLException e) {
            System.out.println("Connection failed: " + e.getMessage());
            throw new SQLException("Failed to establish connection.");
        }
    }
}
```



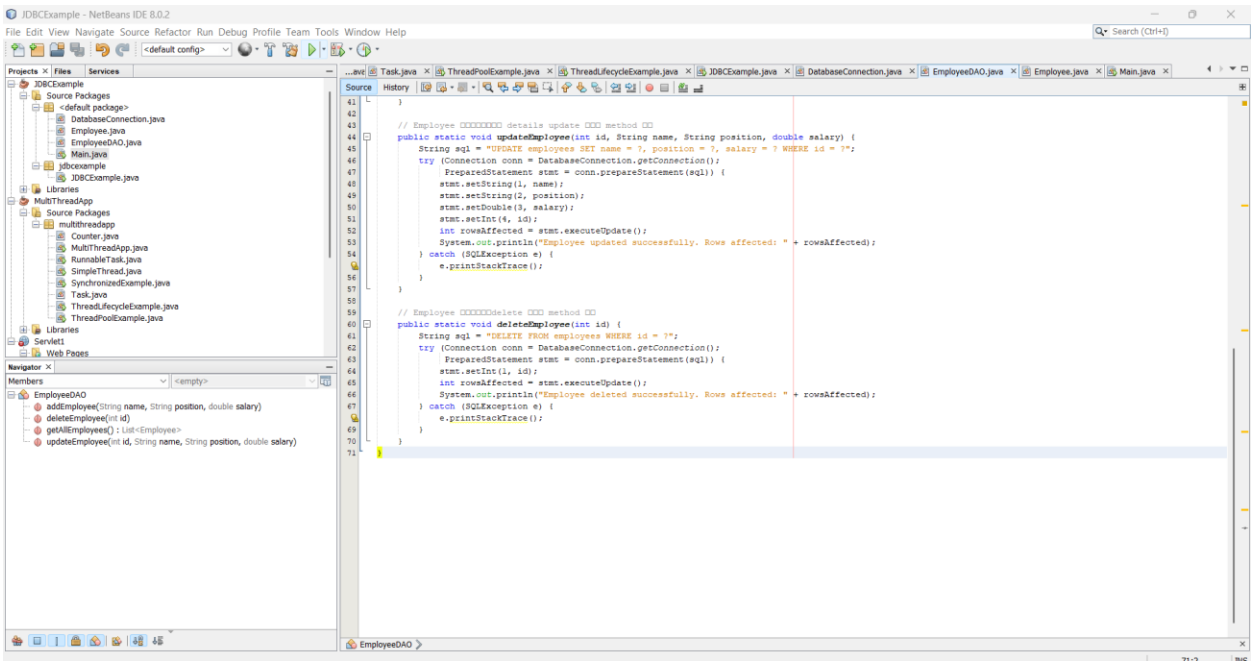
4. Perform CRUD Operations

- EmployeeDAO.java

```
import java.sql.*;

import java.util.ArrayList;

import java.util.List;


public class EmployeeDAO {

    public static void addEmployee(String name, String position, double salary) {

        String sql = "INSERT INTO employees (name, position, salary) VALUES (?, ?, ?)";

        try (Connection conn = DatabaseConnection.getConnection();

             PreparedStatement stmt = conn.prepareStatement(sql)) {

            stmt.setString(1, name);

            stmt.setString(2, position);

            stmt.setDouble(3, salary);

            int rowsAffected = stmt.executeUpdate();

            System.out.println("Employee added successfully. Rows affected: " +
rowsAffected);

        } catch (SQLException e) {

            e.printStackTrace();

        }

    }

    public static List<Employee> getAllEmployees() {

        List<Employee> employees = new ArrayList<>();
```

```
        String sql = "SELECT * FROM employees";
        try (Connection conn = DatabaseConnection.getConnection();
             Statement stmt = conn.createStatement();
             ResultSet rs = stmt.executeQuery(sql)) {
            while (rs.next()) {
                Employee employee = new Employee(
                        rs.getInt("id"),
                        rs.getString("name"),
                        rs.getString("position"),
                        rs.getDouble("salary")
                );
                employees.add(employee);
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return employees;
    }
    public static void updateEmployee(int id, String name, String position, double salary) {
        String sql = "UPDATE employees SET name = ?, position = ?, salary = ? WHERE
id = ?";
        try (Connection conn = DatabaseConnection.getConnection();
             PreparedStatement stmt = conn.prepareStatement(sql)) {
            stmt.setString(1, name);
            stmt.setString(2, position);
```

```
            stmt.setDouble(3, salary);

            stmt.setInt(4, id);

            int rowsAffected = stmt.executeUpdate();

            System.out.println("Employee updated successfully. Rows affected: " +
rowsAffected);

        } catch (SQLException e) {

            e.printStackTrace();

        }

    }



    public static void deleteEmployee(int id) {

        String sql = "DELETE FROM employees WHERE id = ?";

        try (Connection conn = DatabaseConnection.getConnection();

             PreparedStatement stmt = conn.prepareStatement(sql)) {

            stmt.setInt(1, id);

            int rowsAffected = stmt.executeUpdate();

            System.out.println("Employee deleted successfully. Rows affected: " +
rowsAffected);

        } catch (SQLException e) {

            e.printStackTrace();

        }

    }

}
```

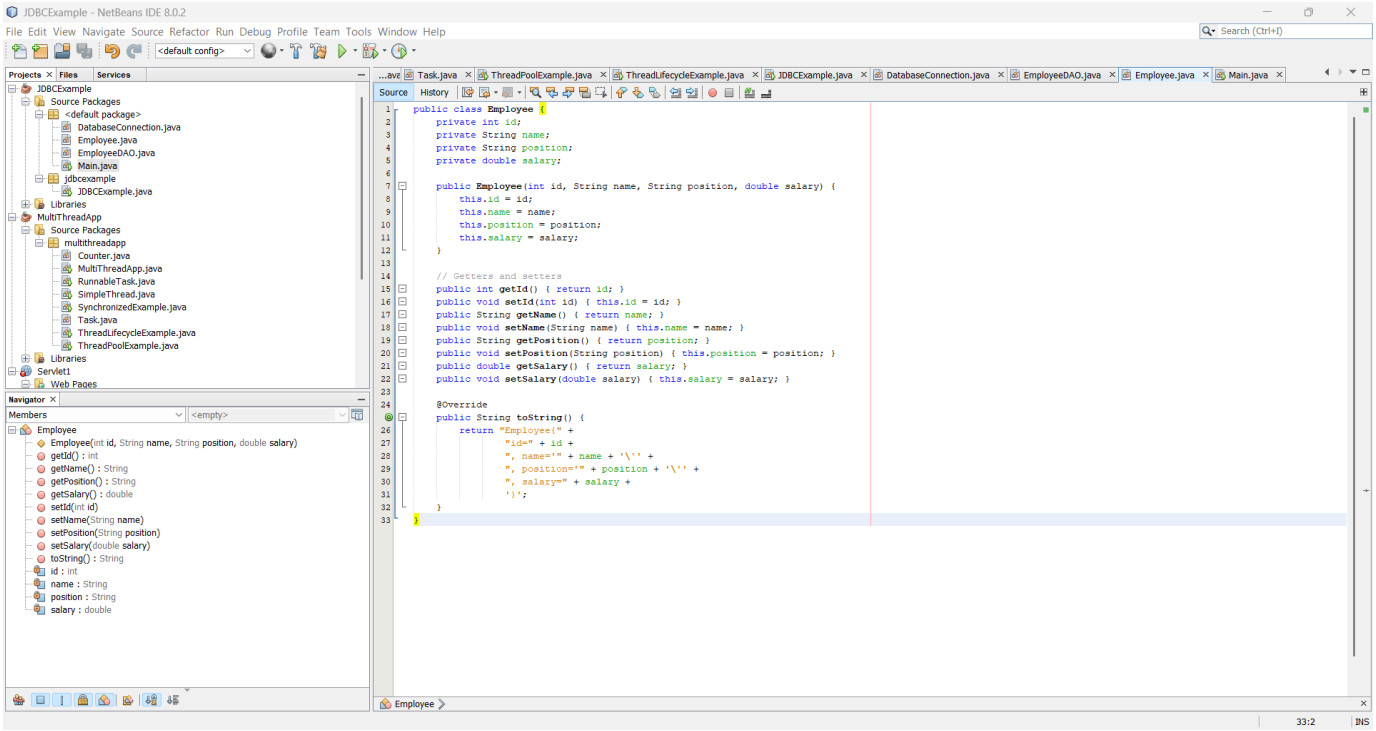


5. Create Employee

- 5. Employee.java Class

```
public class Employee {
    private int id;
    private String name;
    private String position;
    private double salary;

    public Employee(int id, String name, String position, double salary) {
        this.id = id;
        this.name = name;
        this.position = position;
        this.salary = salary;
```

```
    }

    public int getId() { return id; }

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

    public String getName() { return name; }

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

    public String getPosition() { return position; }

    public void setPosition(String position) { this.position = position; }

    public double getSalary() { return salary; }

    public void setSalary(double salary) { this.salary = salary; }


    @Override

    public String toString() {

        return "Employee{" +

                "id=" + id +

                ", name='" + name + '\'' +

                ", position='" + position + '\'' +

                ", salary=" + salary +

                '}';

    }

}
```



6. Test the Application

- Main.java

```
import java.util.List;


public class Main {

    public static void main(String[] args) {


        EmployeeDAO.addEmployee("Alice Cooper", "Developer", 70000);

        EmployeeDAO.addEmployee("Bob Marley", "Manager", 80000);

        EmployeeDAO.updateEmployee(1, "John Doe", "Senior Software Engineer",
90000);


        List<Employee> employees = EmployeeDAO.getAllEmployees();
```

```
        employees.forEach(System.out::println);

        EmployeeDAO.deleteEmployee(2);

    }

}
```