GAM/IT/2022/F/0023 – P.N.G. Pathiraja

Java JDBC Lab Practical using NetBeans IDE 8.2

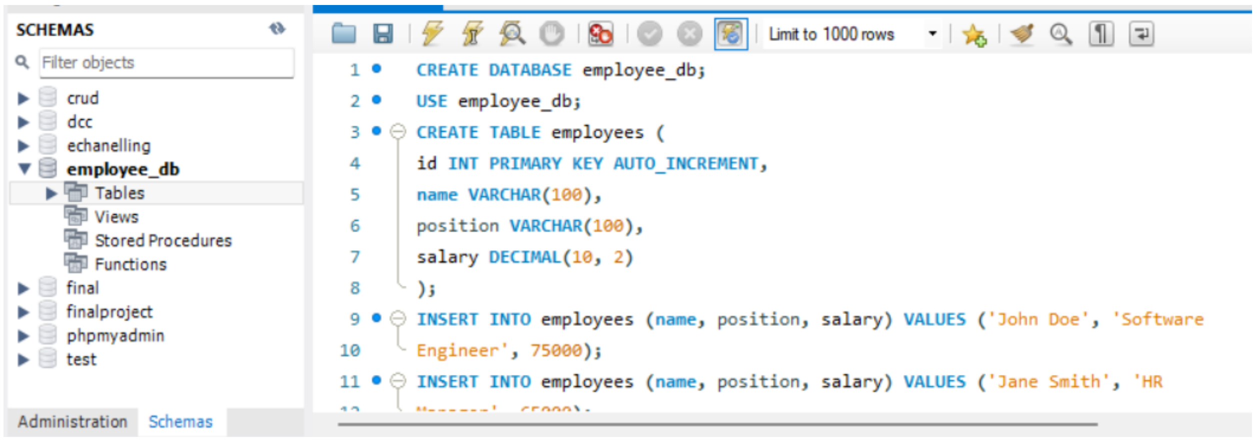
1. Set Up MySQL Database

```
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);
```



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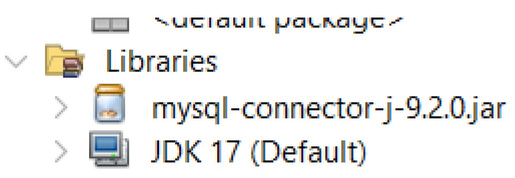
2. Set Up NetBeans Project



3. Establish JDBC Connection

```
package jdbcexample;

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"; //
Database URL
  private static final String USER = "root"; // Your MySQL username
  private static final String PASSWORD = ""; // Your MySQL password

   public static Connection getConnection() throws SQLException {
     try {
       // Load the JDBC driver
       Class.forName("com.mysql.cj.jdbc.Driver");
       // Return the database connection
       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

```
package jdbcexample;


import java.sql.*;

import java.util.ArrayList;

import java.util.List;


public class EmployeeDAO {

    // Create an employee

   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();

      }
    }


     // Read all employees
    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("sala
ry"));
                employees.add(employee);
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }


        return employees;
    }



     // Update an employee's information
    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();
        }
    }

     // Delete an employee
    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.java Class

```
package jdbcexample;
/**
 *
 * @author Naveen Gayashan
 */
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;

    }


    // Getters and setters

    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

```
package jdbcexample;


import java.util.List;
/**
 *
 * @author Naveen Gayashan
 */
public class Main {
    public static void main(String[] args) {
        // Add employees
        EmployeeDAO.addEmployee("Alice Cooper", "Developer", 70000);
        EmployeeDAO.addEmployee("Bob Marley", "Manager", 80000);

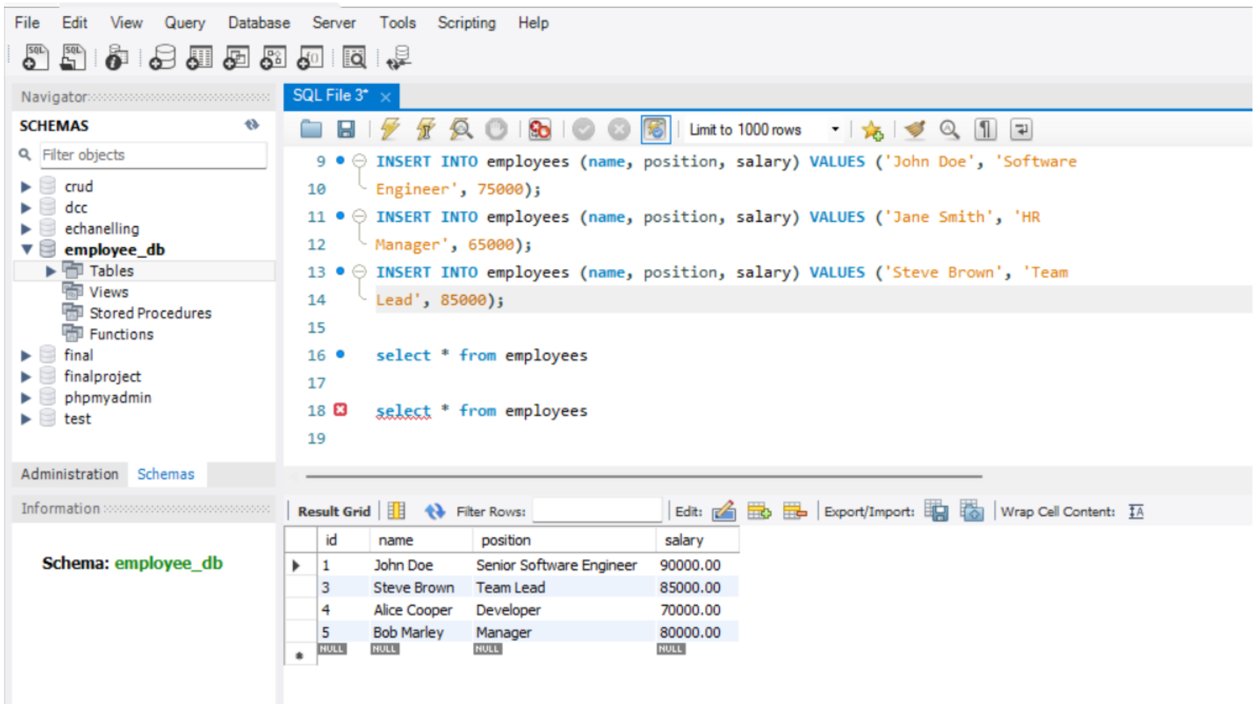
        // Update employee
        EmployeeDAO.updateEmployee(1, "John Doe", "Senior Software Engineer", 90000);

        // Get all employees
        List<Employee> employees = EmployeeDAO.getAllEmployees();
        employees.forEach(System.out::println);

        // Delete employee
        EmployeeDAO.deleteEmployee(2);
        }
    }
```

7. Run the Application

output



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INSERT INTO employees (name, position, salary) VALUES ('Steve Brown', 'Team
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select * from employees

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```

id	name	position	salary
1	John Doe	Senior Software Engineer	90000.00
3	Steve Brown	Team Lead	85000.00
4	Alice Cooper	Developer	70000.00
5	Bob Marley	Manager	80000.00
NULL	NULL	NULL	NULL

Schema: employee_db