

Lab sheet 03

Task 01

```
CREATE DATABASE employee_db;
```

```
USE employee_db;
```

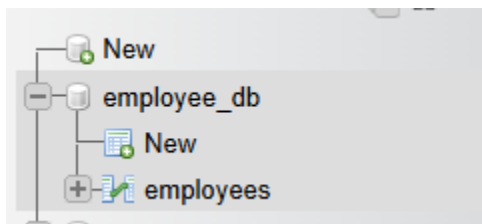
```
CREATE TABLE employees (  
    id INT PRIMARY KEY AUTO_INCREMENT,  
    name VARCHAR(100),  
    position VARCHAR(100),  
    salary DECIMAL(10, 2)  
);
```

```
-- Insert some sample data
```

```
INSERT INTO employees (name, position, salary) VALUES ('John Doe', 'Software Engineer',  
75000);
```

```
INSERT INTO employees (name, position, salary) VALUES ('Jane Smith', 'HR Manager',  
65000);
```

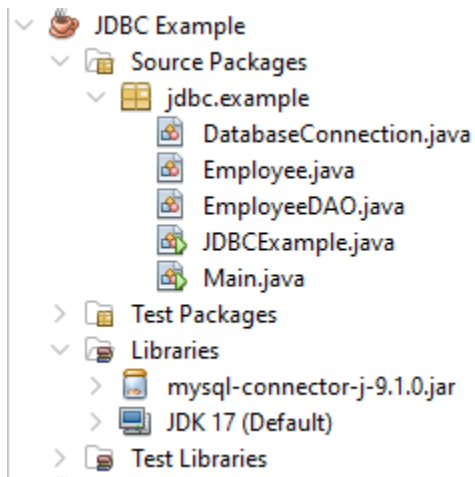
```
INSERT INTO employees (name, position, salary) VALUES ('Steve Brown', 'Team Lead',  
85000);
```



Task 02

2. Set Up NetBeans Project

1. Open NetBeans IDE 8.2.
2. Create a new Java application:
 - Go to File > New Project.
 - Select Java as the project type, and choose Java Application.
 - Name your project JDBCExample.
3. Add MySQL JDBC Driver to your project:
 - Right-click on the project in the Projects pane.
 - Select Properties.
 - In the Libraries tab, click Add JAR/Folder.
 - Navigate to the location of your mysql-connector-java-x.x.xx.jar file and add it.



Task 03

3. Establish JDBC Connection

- Create a **DatabaseConnection.java** class to establish a connection to your database.

```
package jdbc.example;

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 = "";

    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.");

        }

    }

}
```

Task 04

4. Perform CRUD Operations

```
package jdbc.example;

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("salary"));

    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();
    }
}
```

Task 05

5. Create Employee.java Class

```
package jdbc.example;

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 + '}';

    }

}
```

Task 06

6. Test the Application

```
package jdbc.example;

import java.util.List;

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);
    }
}
```


Task 07

7. Run the Application

Run the program and observe how the database is updated with the CRUD operations.

- First, the employees will be added to the database.
- Then, one employee's details will be updated.
- All employees will be fetched and displayed in the console.
- Finally, one employee will be deleted.

				id	name	position	salary
<input type="checkbox"/>	 Edit	 Copy	 Delete	1	John Doe	Senior Software Engineer	90000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	3	Steve Brown	Team Lead	85000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	4	Alice Cooper	Developer	70000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	5	Bob Marley	Manager	80000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	6	Alice Cooper	Developer	70000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	7	Bob Marley	Manager	80000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	8	Alice Cooper	Developer	70000.00
<input type="checkbox"/>	 Edit	 Copy	 Delete	9	Bob Marley	Manager	80000.00