GAM/IT/2022/F/0079 – J.S.Senarath

Java JDBC Lab Practical using NetBeans IDE 8.2

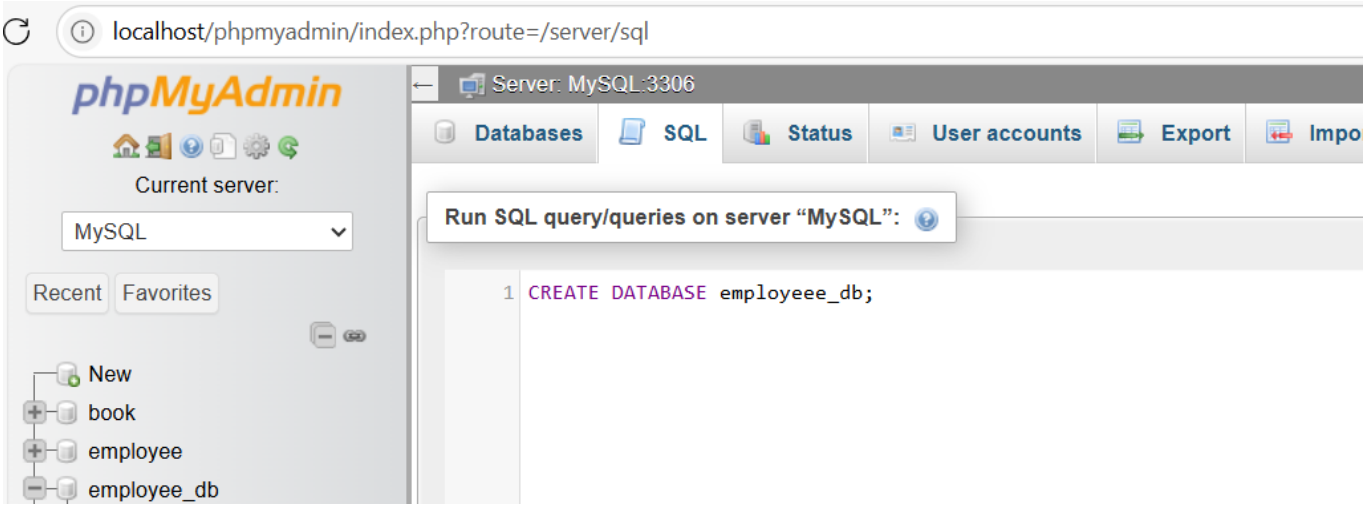
Java JDBC Lab Practical using NetBeans IDE 8.2

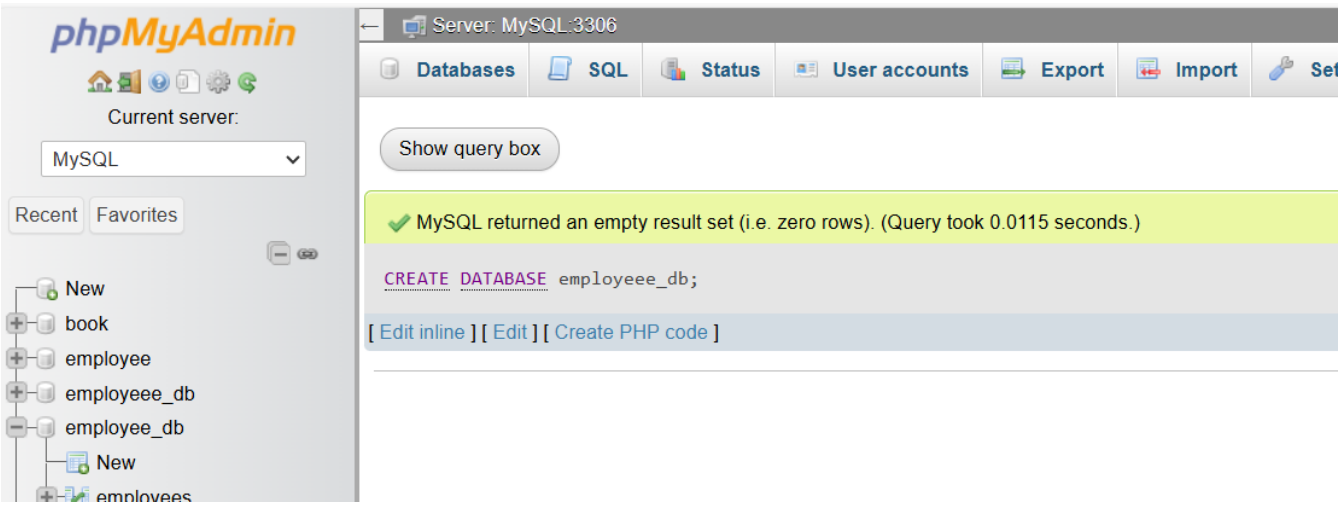
1. Set Up MySQL Database

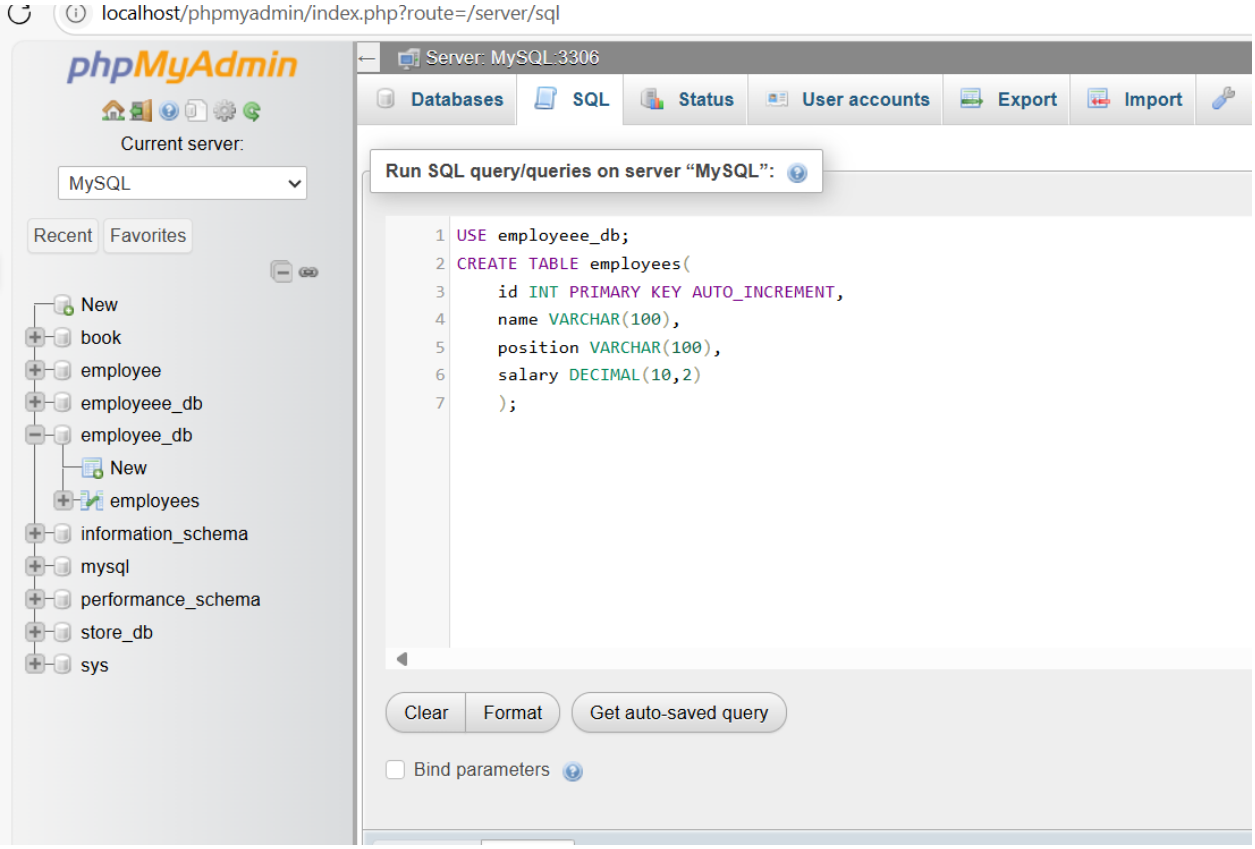
● Install MySQL (if you haven't already) and create a database for the lab.

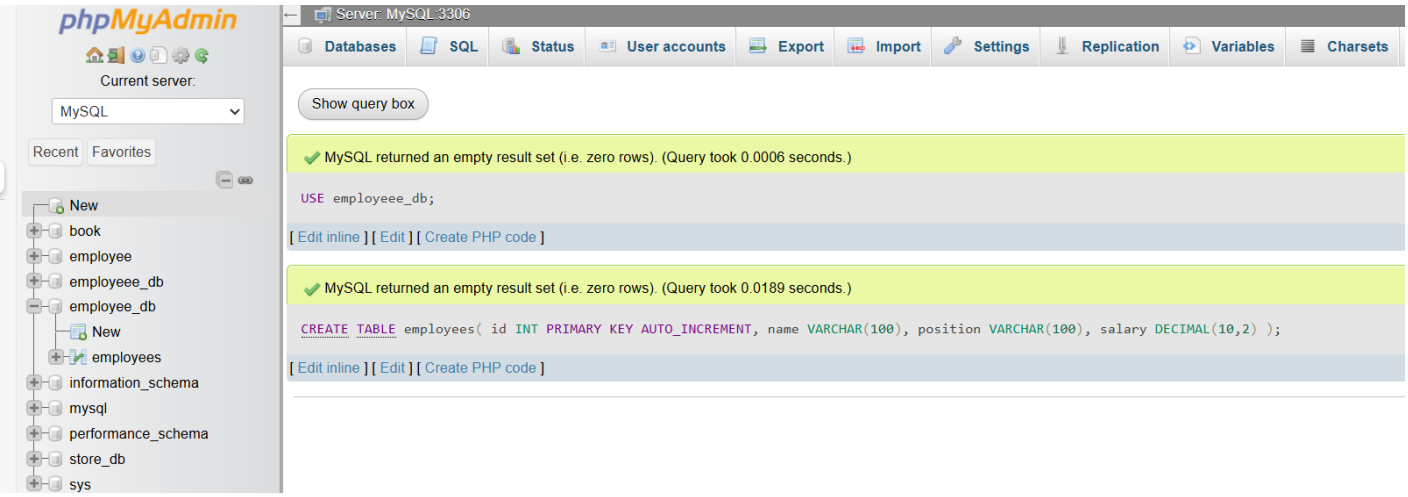
● Open MySQL Workbench or command line and execute the following SQL commands:

```
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);
```

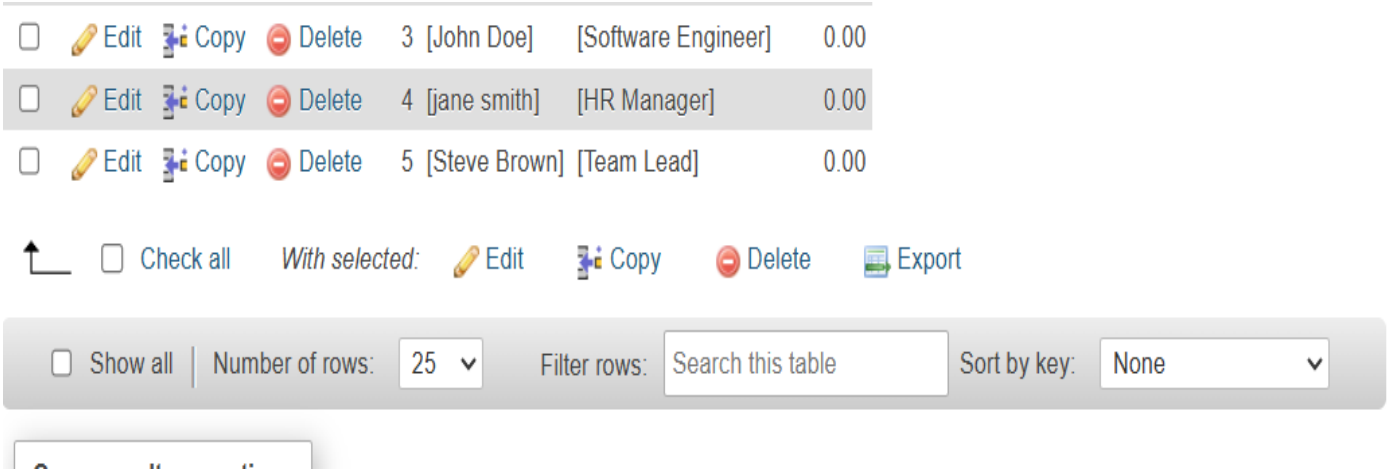

localhost/phpmyadmin/index.php?route=/server/sql
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
book
employee
employee_db
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
Impo
Run SQL query/queries on server "MySQL":
1 CREATE DATABASE employeee_db;


phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
book
employee
employeee_db
employee_db
New
employees
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
Import
Show query box
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0115 seconds.)
CREATE DATABASE employeee_db;
[Edit inline] [Edit] [Create PHP code]


localhost/phpmyadmin/index.php?route=/server/sql
phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
book
employee
employeee_db
employee_db
New
employees
information_schema
mysql
performance_schema
store_db
sys
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
Import
Run SQL query/queries on server "MySQL":
USE employeee_db;
CREATE TABLE employees(
id INT PRIMARY KEY AUTO_INCREMENT,
name VARCHAR(100),
position VARCHAR(100),
salary DECIMAL(10,2)
);
Clear
Format
Get auto-saved query
Bind parameters


phpMyAdmin
Current server:
MySQL
Recent
Favorites
New
book
employee
employeee_db
employee_db
New
employees
information_schema
mysql
performance_schema
store_db
sys
Server: MySQL:3306
Databases
SQL
Status
User accounts
Export
Import
Settings
Replication
Variables
Charsets
Show query box
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0006 seconds.)
USE employeee_db;
[Edit inline] [Edit] [Create PHP code]
MySQL returned an empty result set (i.e. zero rows). (Query took 0.0189 seconds.)
CREATE TABLE employees(id INT PRIMARY KEY AUTO_INCREMENT, name VARCHAR(100), position VARCHAR(100), salary DECIMAL(10,2));
[Edit inline] [Edit] [Create PHP code]

```
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

1. Open NetBeans IDE 8.2.

2. Create a new Java application:

o Go to File > New Project.

o Select Java as the project type, and choose Java Application.

o Name your project JDBCExample.

3. Add MySQL JDBC Driver to your project:

o Right-click on the project in the Projects pane.

o Select Properties.

o In the Libraries tab, click Add JAR/Folder.

o Navigate to the location of your mysql-connector-java-x.x.xx.jar file and add it.

3. Establish JDBC Connection

● Create a DatabaseConnection.java class to establish a connection to your database.

Code for DatabaseConnection.java:

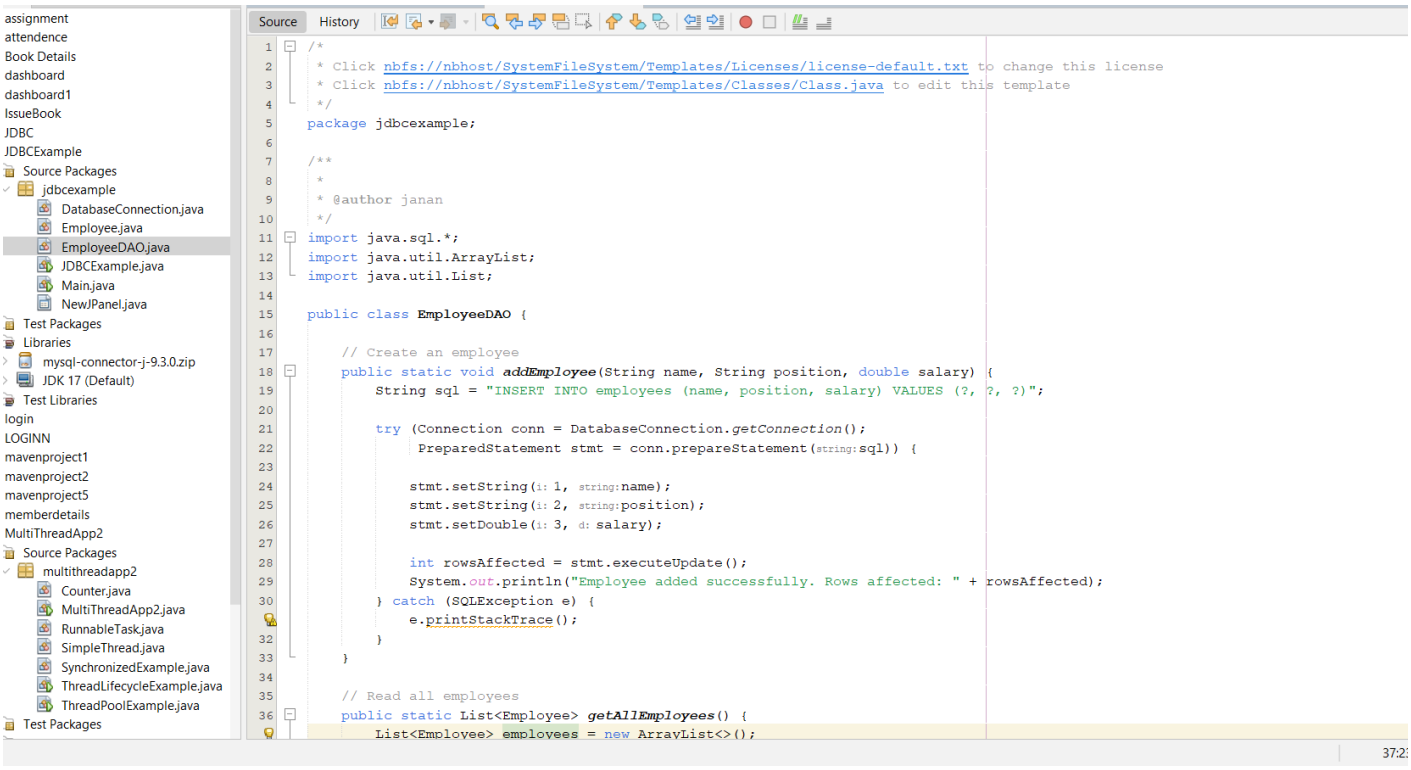
```
package jdbcexample;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

public class DatabaseConnection {
    private static final String URL = "jdbc:mysql://localhost:3306/employeee_db"; // Database URL
```

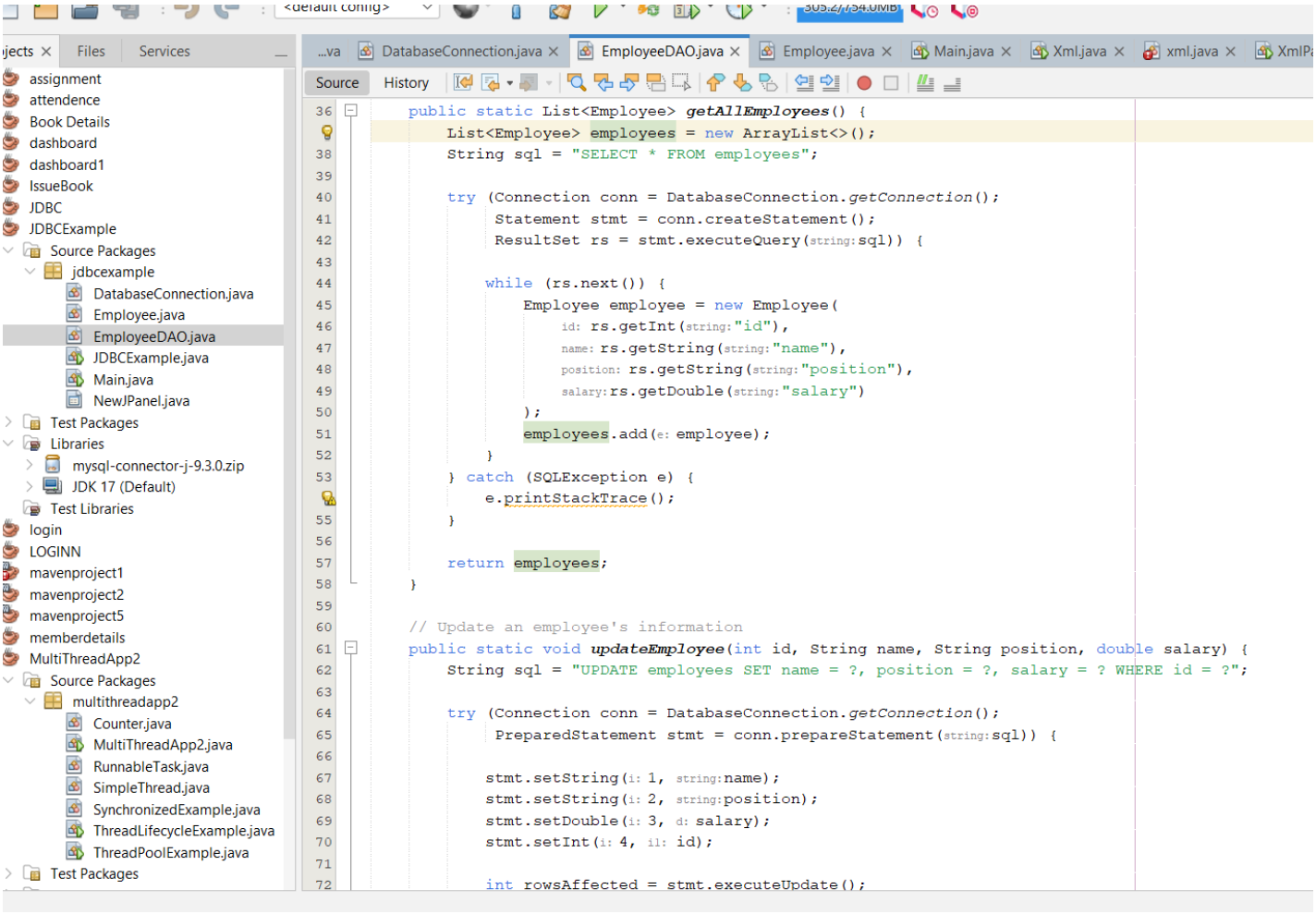
```
    private static final String USER = "root"; // Your MySQL username
    private static final String PASSWORD = ""; // Your MySQL password

    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

Next, we will create a class called EmployeeDAO.java that contains methods for performing CRUD operations.

1. Create EmployeeDAO.java for CRUD Operations:


assignment
attendence
Book Details
dashboard
dashboard1
IssueBook
JDBC
JDBCExample
Source Packages
jdbcexample
DatabaseConnection.java
Employee.java
EmployeeDAO.java
JDBCExample.java
Main.java
NewJPanel.java
Test Packages
Libraries
mysql-connector-j-9.3.0.zip
JDK 17 (Default)
Test Libraries
login
LOGINN
mavenproject1
mavenproject2
mavenproject5
memberdetails
MultiThreadApp2
Source Packages
multithreadapp2
Counter.java
MultiThreadApp2.java
RunnableTask.java
SimpleThread.java
SynchronizedExample.java
ThreadLifecycleExample.java
ThreadPoolExample.java
Test Packages
Source
History
/*
* Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
* Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
*/
package jdbcexample;
/**
*
* @author janan
*/
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(string:sql)) {
stmt.setString(i: 1, string:name);
stmt.setString(i: 2, string:position);
stmt.setDouble(i: 3, d: 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<>();
37:2


Files
Services
assignment
attendence
Book Details
dashboard
dashboard1
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JDBC
JDBCExample
Source Packages
jdbcexample
DatabaseConnection.java
Employee.java
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JDBCExample.java
Main.java
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mavenproject1
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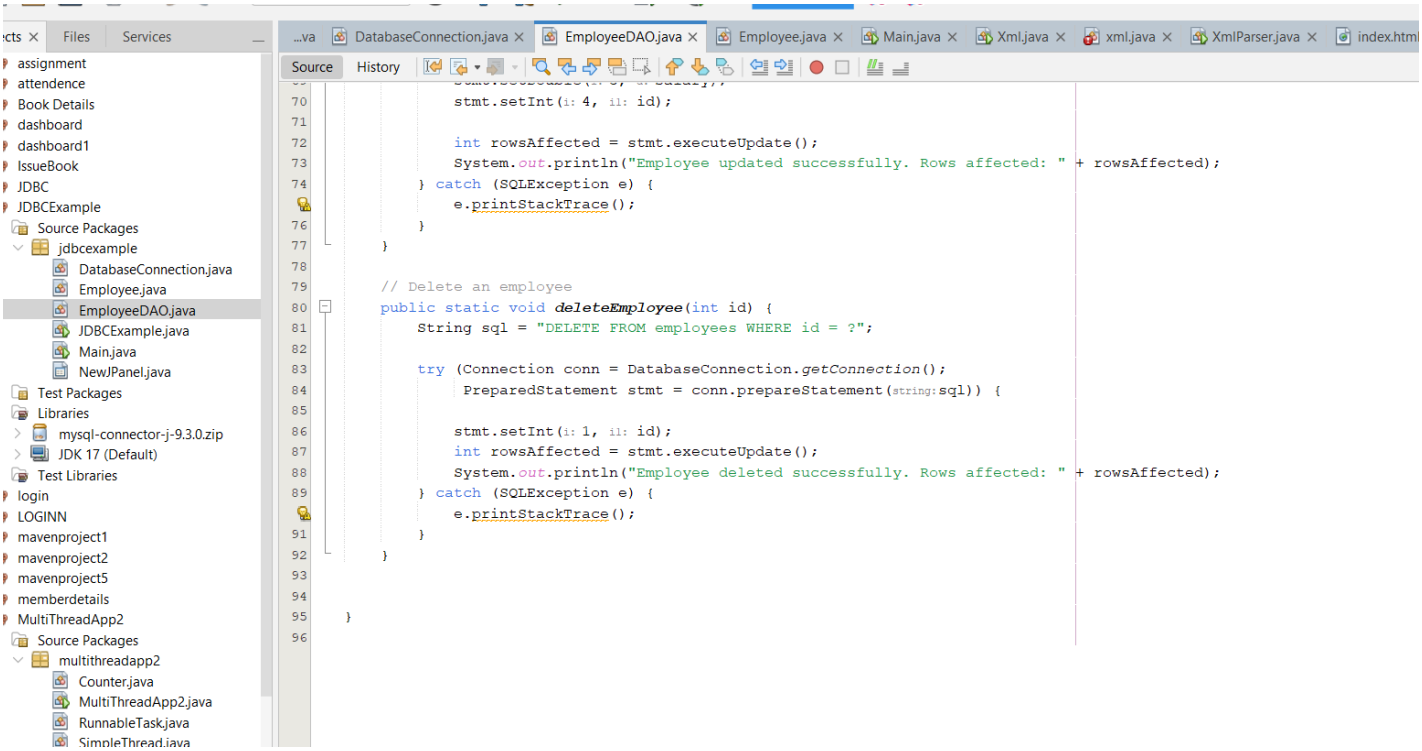
mavenproject5
memberdetails
MultiThreadApp2
Source Packages
multithreadapp2
Counter.java
MultiThreadApp2.java
RunnableTask.java
SimpleThread.java
SynchronizedExample.java
ThreadLifecycleExample.java
ThreadPoolExample.java
Test Packages
DatabaseConnection.java
EmployeeDAO.java
Employee.java
Main.java
Xml.java
xml.java
Source
History
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(string:sql)) {
while (rs.next()) {
Employee employee = new Employee(
id: rs.getInt(string:"id"),
name: rs.getString(string:"name"),
position: rs.getString(string:"position"),
salary:rs.getDouble(string:"salary")
);
employees.add(e: 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(string:sql)) {
stmt.setString(i: 1, string:name);
stmt.setString(i: 2, string:position);
stmt.setDouble(i: 3, d: salary);
stmt.setInt(i: 4, i1: id);
int rowsAffected = stmt.executeUpdate();



5. Create Employee.java Class

Create a simple Employee.java POJO (Plain Old Java Object) to represent employee data.
Code for Employee.java:

```
 *
 * @author janan
 */
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

Create a Main.java class to test the CRUD operations.

Code for Main.java:

```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package jdbcexample;
import java.util.List;

public class Main {

    public static void main(String[] args) {
        // Add employees
        EmployeeDAO.addEmployee(name: "Alice Cooper", position: "Developer", salary:70000);
        EmployeeDAO.addEmployee(name: "Bob Marley", position: "Manager", salary:80000);

        // Update employee
        EmployeeDAO.updateEmployee(id: 1, name: "John Doe", position: "Senior Software Engineer", salary:90000);

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

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