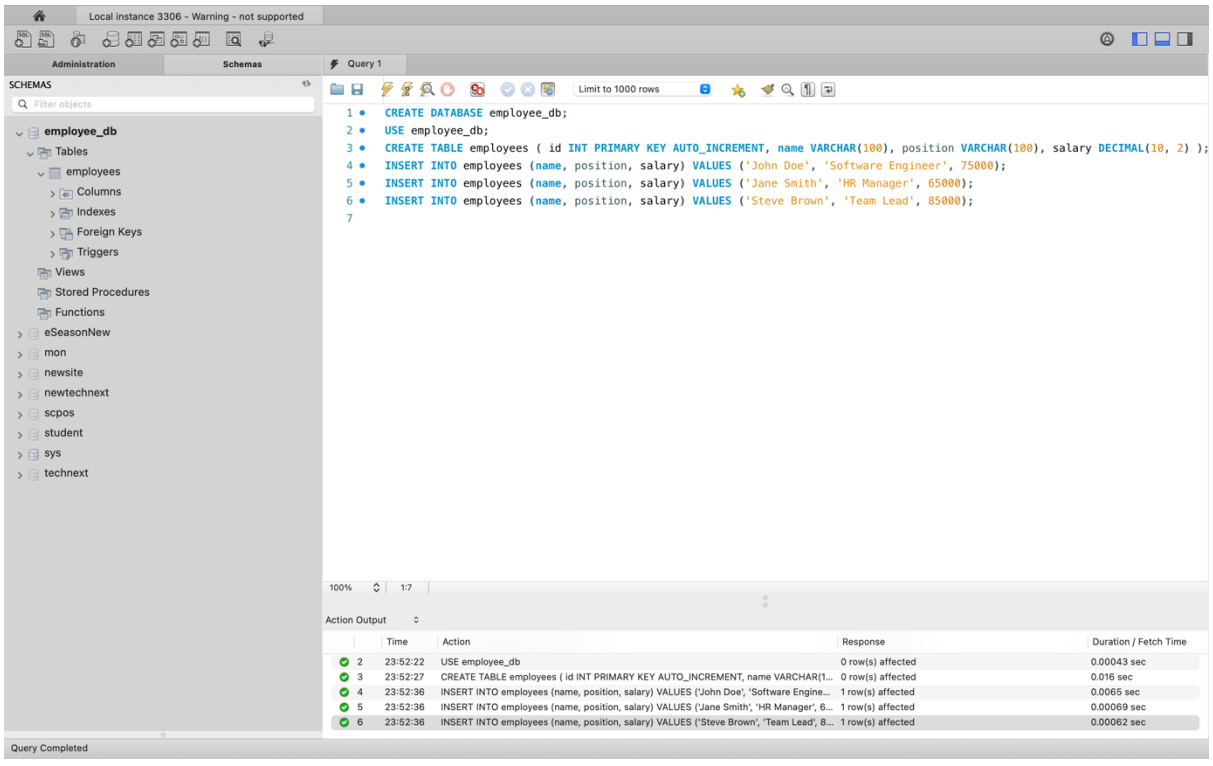
GAM/IT/2022/F/0070

Java JDBC Lab Practical

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 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);
```



2. Establish JDBC Connection

```
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;
/**
 *
 * @author USER
 */
public class DatabaseConnection {
 private static final String URL = "jdbc:mysql://localhost:3306/employee_db";
  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.");
        }
    }

}
```

3. Perform CRUD Operations

```
import java.sql.*;
import java.util.ArrayList;
import java.util.List;

/**
 *
 * @author USER
 */
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();
        }
    }
}
```

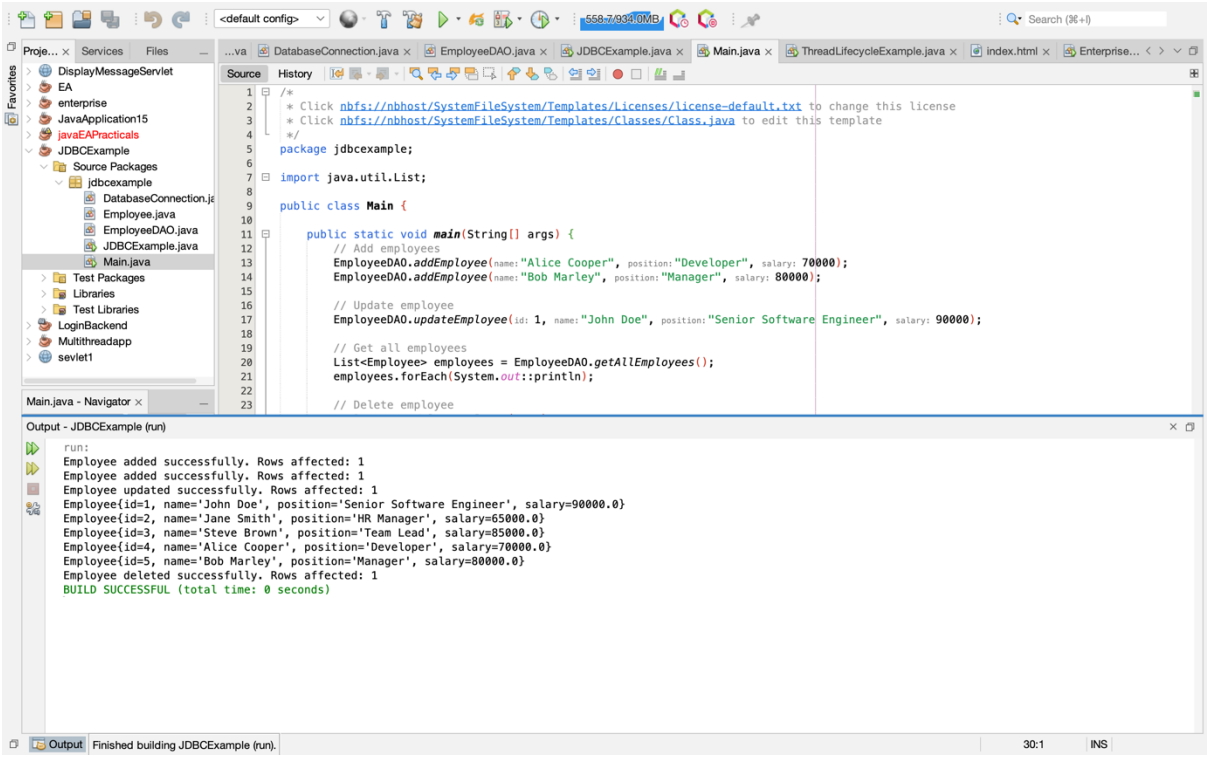
Part 4: Create Employee.java Class

```
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;
    }

    // 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 + '}';
    }

}
```

5. Test the Application

```
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);


    }

}
```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JDBCExample.java
Main.java
Test Packages
Libraries
Test Libraries
LoginBackend
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Source History
1 /*
2 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
3 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
4 */
5 package jdbcexample;
6
7 import java.util.List;
8
9 public class Main {
10
11 public static void main(String[] args) {
12 // Add employees
13 EmployeeDAO.addEmployee(name:"Alice Cooper", position:"Developer", salary: 70000);
14 EmployeeDAO.addEmployee(name:"Bob Marley", position:"Manager", salary: 80000);
15
16 // Update employee
17 EmployeeDAO.updateEmployee(id: 1, name:"John Doe", position:"Senior Software Engineer", salary: 90000);
18
19 // Get all employees
20 List<Employee> employees = EmployeeDAO.getAllEmployees();
21 employees.forEach(System.out::println);
22
23 // Delete employee
Output - JDBCExample (run)
run:
Employee added successfully. Rows affected: 1
Employee added successfully. Rows affected: 1
Employee updated successfully. Rows affected: 1
Employee{id=1, name='John Doe', position='Senior Software Engineer', salary=90000.0}
Employee{id=2, name='Jane Smith', position='HR Manager', salary=65000.0}
Employee{id=3, name='Steve Brown', position='Team Lead', salary=85000.0}
Employee{id=4, name='Alice Cooper', position='Developer', salary=70000.0}
Employee{id=5, name='Bob Marley', position='Manager', salary=80000.0}
Employee deleted successfully. Rows affected: 1
BUILD SUCCESSFUL (total time: 0 seconds)
Output
Finished building JDBCExample (run).
30:1
INS