UNIVERSITI MALAYSIA TERENGGANU

CSM3023 WEB BASED APPLICATION DEVELOPMENT

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

LAB 6

SEMESTER II 2023/2024

Prepared for:

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(S67943)

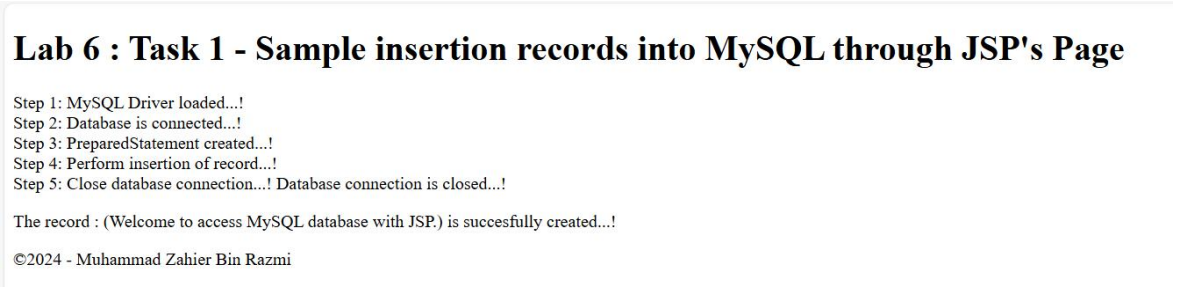
Task 1 : Using JSP Page to Access a Simple MySQL Database

Code:

SampleInsertionRecord.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page import="java.sql.*" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 1</title>
    </head>
    <body>
        <h1>Lab 6 : Task 1 - Sample insertion records into MySQL through JSP's Page</h1>

        <%
            int result;

            // Step 1: Load JDBC Driver
            Class.forName("com.mysql.jdbc.Driver");
            out.println("Step 1: MySQL Driver loaded...!");
        %>
        <br>
        <%
            // Step 2: Establish the connection
            String myURL = "jdbc:mysql://localhost/lab6_task1";
            Connection myConnection = DriverManager.getConnection(myURL, "root", "admin");
            out.println("Step 2: Database is connected...!");
        %>
        <br>
        <%
            // Step 3: Create a PreparedStatement object
            out.println("Step 3: PreparedStatement created...!");
            String sInsertQry = "INSERT INTO firsttable VALUES (?)";
            PreparedStatement myPS = myConnection.prepareStatement(sInsertQry);
        %>
        <br>
        <%
            // Step 4: Assign each value to respective columns for first_table
            out.println("Step 4: Perform insertion of record...!");
            String name = "Welcome to access MySQL database with JSP.";
            myPS.setString(1, name);

            result = myPS.executeUpdate();

            if (result > 0) {
        %>
        <br>
        <%
                out.println("Step 5: Close database connection...!");
                out.println(" ");
                out.println("Database connection is closed...!");

                out.print("<p>" + "The record : (" + name + ") is succesfully created...!</p>");
            }
            // Step 5: Close database connection
            myConnection.close();
        %>

        <footer>
            &copy;2024 - Muhammad Zahier Bin Razmi
        </footer>
    </body>
</html>
```

Output:



Lab 6 : Task 1 - Sample insertion records into MySQL through JSP's Page

Step 1: MySQL Driver loaded...!
Step 2: Database is connected...!
Step 3: PreparedStatement created...!
Step 4: Perform insertion of record...!
Step 5: Close database connection...! Database connection is closed...!

The record : (Welcome to access MySQL database with JSP.) is succesfully created...!

Task 2: Create Records via JSP Page

Code:

insertAuthor.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page import="java.sql.*" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 2</title>
    </head>
    <body>
        <h1>Lab 6 : Task 2 - Perform creating and retrieving records via JSP page</h1>

        <form action="processAuthor.jsp">
            <fieldset>
                <legend><b>Author Registration</b></legend>
                <table>
                    <tr>
                        <td><label for="authorNo">Author No</label></td>
                        <td><input type="text" name="authorNo" id="authorNo" placeholder="E.g. UKXXXXX"></td>
                    </tr>
                    <tr>
                        <td><label for="name">Name</label></td>
                        <td><input type="text" name="name" id="name" placeholder="Enter your name"></td>
                    </tr>
                    <tr>
                        <td><label for="address">Address</label></td>
                        <td><input type="text" name="address" id="address" placeholder="Enter your address"></td>
                    <tr>
                        <td><label for="city">City</label></td>
                        <td><input type="text" name="city" id="city" placeholder="Enter your city"></td>
                    </tr>
                    <tr>
                        <td><label for="state">State</label></td>
                        <td><input type="text" name="state" id="state" placeholder="Enter your state"></td>
                    </tr>
                    <tr>
                        <td><label for="zip">Zip</label></td>
                        <td><input type="text" name="zip" id="zip" placeholder="Enter your zip"></td>
                    </tr>
                    <tr>
                        <td>
                            <br>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </fieldset>
        </form>
        <br>
        <footer>
            &copy;2024 - Muhammad Zahier Bin Razmi
        </footer>
    </body>
</html>
```

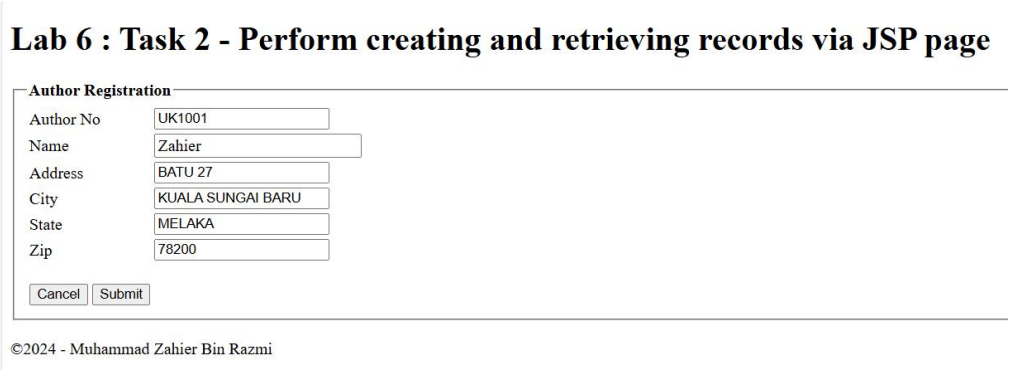
Author.java

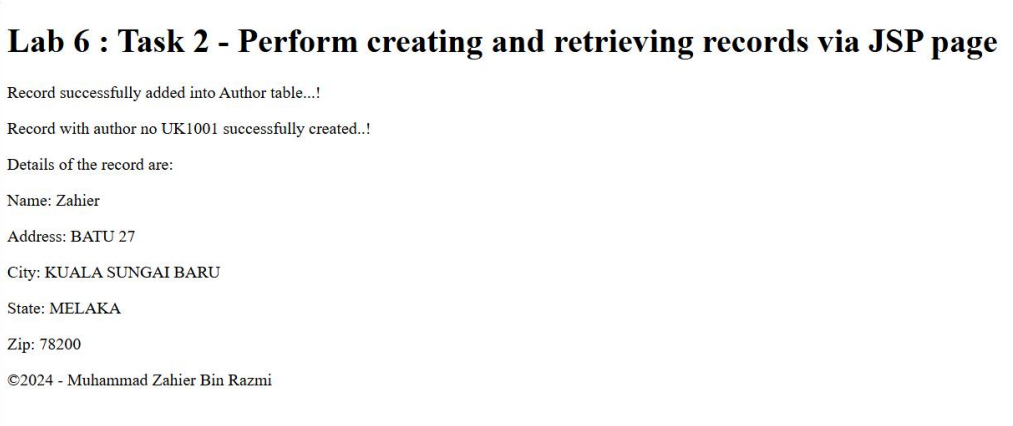
```java
public class Author {

    private String authorNo, name, address, city, state, zip;

    public String getAuthorNo() {
        return authorNo;
    }

    public void setAuthorNo(String authorNo) {
        this.authorNo = authorNo;
    }

    public String getName() {
        return name;
    }

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

    public String getAddress() {
        return address;
    }

    public void setAddress(String address) {
        this.address = address;
    }
    public String getCity() {
        return city;
    }

    public void setCity(String city) {
        this.city = city;
    }

    public String getState() {
        return state;
    }

    public void setState(String state) {
        this.state = state;
    }

    public String getZip() {
        return zip;
    }

    public void setZip(String zip) {
        this.zip = zip;
    }
}
```

processAuthor.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page import="java.sql.*" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 2</title>
    </head>
    <body>
        <h1>Lab 6 : Task 2 - Perform creating and retrieving records via JSP page</h1>

        <jsp:useBean id="author" class="lab6.javabeans.Author" scope="request" >
            <jsp:setProperty name="author" property="*" />
        </jsp:useBean>

        <%
            int result;

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

            String jdbcurl = "jdbc:mysql://localhost/lab6_task1";
            String username = "root";
            String password = "admin";

            Connection connection = DriverManager.getConnection(jdbcurl, username, password);

            String insertQuery = "INSERT INTO author VALUES (?, ?, ?, ?, ?, ?)";

            PreparedStatement preparedStatement = connection.prepareStatement(insertQuery);

            preparedStatement.setString(1, author.getAuthorNo());
            preparedStatement.setString(2, author.getName());
            preparedStatement.setString(3, author.getAddress());
            preparedStatement.setString(4, author.getCity());
            preparedStatement.setString(5, author.getState());
            preparedStatement.setString(6, author.getZip());

            result = preparedStatement.executeUpdate();

            if (result > 0) {
                out.println("\tRecord successfully added into Author table...!");
                out.print("<p>Record with author no " + author.getAuthorNo() + " successfully created..!</p>");
                out.print("<p>Details of the record are:</p>");
                out.print("<p>Name: " + author.getName() + "</p>");
                out.print("<p>Address: " + author.getAddress() + "</p>");
                out.print("<p>City: " + author.getCity() + "</p>");
                out.print("<p>State: " + author.getState() + "</p>");
                out.print("<p>Zip: " + author.getZip() + "</p>");
            }

            connection.close();
        %>

        <footer>
            &copy;2024 - Muhammad Zahier Bin Razmi
        </footer>
    </body>
</html>
```

Output:





authno	NAME	address	city	state	zip
UK1001	Zahier	BATU 27	KUALA SUNGAI BARU	MELAKA	78200
NULL	NULL	NULL	NULL	NULL	NULL

Reflection:

1. What have you learned from this exercise?

   From this exercise, I have learned how to use JSP to insert and retrieve records from MySQL database.

2. Define step by step before you successfully perform the transaction in a database.

   - The user enters their information in the form on authorRegistration.jsp.
   - When the user clicks the "Submit" button, the form is submitted to processAuthor.jsp.
   - The processAuthor.jsp code establishes a connection to the MySQL database using the provided JDBC URL, username, and password.

- An INSERT statement is prepared to insert a new record into the author table in the database.
- The values from the submitted form are retrieved from the Author Javabean object using getters and then set as parameters in the prepared statement. This ensures data is inserted in the correct order for the table columns.
- The executeUpdate() method is called on the prepared statement to execute the INSERT statement and insert the new record into the database.
- The number of rows affected by executeUpdate() is stored in the result variable.
- If result is greater than 0, then the insertion was successful. The code prints a message indicating success and displays the details of the inserted record retrieved from the Author object.
- The connection to the database is closed to release resources.

Task 3: Create Records Constrained by Regular Expression In JSP

Code:

Student.java

```
public class Student {

    private String studNo, studName, studProgram;

    public String getStudNo() {
        return studNo;
    }

    public void setStudNo(String studNo) {
        this.studNo = studNo;
    }

    public String getStudName() {
        return studName;
    }

    public void setStudName(String studName) {
        this.studName = studName;
    }

    public String getStudProgram() {
        return studProgram;
    }

    public void setStudProgram(String studProgram) {
        this.studProgram = studProgram;
    }
    public String getProgramAsString() {
        switch (getStudProgram()) {
            case "1":
                return "BSC (Software Engineering)";

            case "2":
                return "BSC with Maritime Informatics";

            case "3":
                return "BSC (Mobile Computing)";

            default:
                return "";
        }
    }
}
```

insertStudent.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 3</title>
    </head>
    <body>
        <h1>Lab 6 : Task 3 - Perform creating and retrieving records via JSP page</h1>

        <form action="processStudent.jsp" onsubmit="return validateInput()">
            <fieldset>
                <legend><b>Student Registration</b></legend>

                <table>
                    <tr>
                        <td><label for="studNo">Student No</label></td>
                        <td><input type="text" name="studNo" id="studNo" placeholder="E.g. S12345" required></td>
                    </tr>
                    <tr>
                        <td><label for="studName">Name</label></td>
                        <td><input type="text" name="studName" id="studName" placeholder="E.g. Ali bin Abu" required></td>
                    </tr>
                    <tr>
                        <td><label for="studProgram">Program</label></td>
                        <td>
                            <select name="studProgram" id="studProgram">
                                <option value="1">BSC (Software Engineering)</option>
                                <option value="2">BSC with Maritime Informatics</option>
                                <option value="3">BSC (Mobile Computing)</option>
                            </select>
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <br>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </fieldset>
        </form>

        <script>
            const studNo = document.getElementById('studNo');

            function validateInput() {
                let valid = true; // Assume validity initially

                // Student number validation
                let studentNoRegex = /^[A-Z0-9]*$/;
                if (!studentNoRegex.test(studNo.value)) {
                    alert('Invalid student number!');
                    valid = false;
                }

                // Prevent default submission if validation fails
                return valid;
            }
        </script>
    </body>
</html>
```

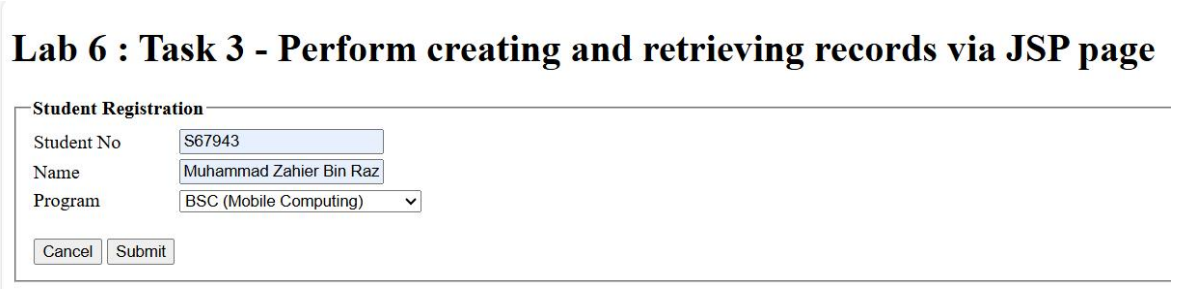
processStudent.jsp

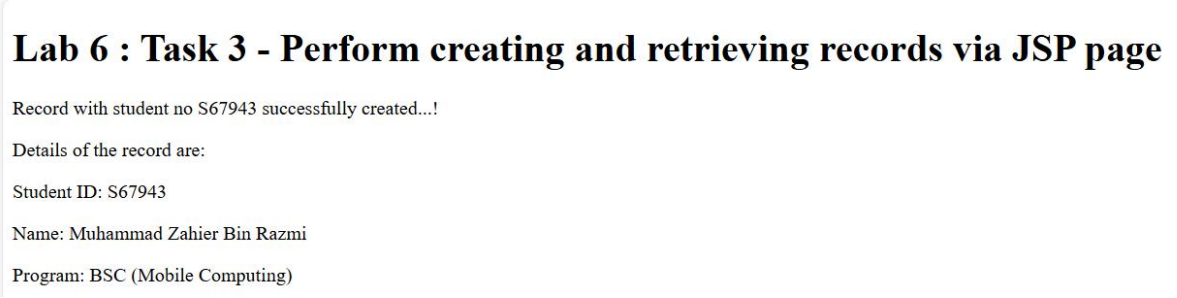
```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page import="java.sql.*" %>
<%@page errorPage="errorStudent.jsp" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 3</title>
    </head>
    <body>
        <h1>Lab 6 : Task 3 - Perform creating and retrieving records via JSP page</h1>

        <!-- Create an object for Student -->
        <jsp:useBean id="student" class="com.model.lab6.Student" scope="request">
            <jsp:setProperty name="student" property="*" />
        </jsp:useBean>

        <%
            int result;

            Class.forName("com.mysql.jdbc.Driver");
            System.out.println("Step 1: MySQL driver loaded...!");

            String jdbcurl = "jdbc:mysql://localhost/lab6_task1";
            String username = "root";
            String password = "admin";
            Connection connection = DriverManager.getConnection(jdbcurl, username, password);
            System.out.println("Step 2: Database is connected...!");

            String insertQuery = "INSERT INTO student VALUES (?, ?, ?)";
            PreparedStatement preparedStatement = connection.prepareStatement(insertQuery);
            System.out.println("Step 3: PreparedStatement is created...!");

            System.out.println("Step 4: Perform insertion of records...!");
            preparedStatement.setString(1, student.getStudNo());
            preparedStatement.setString(2, student.getStudName());
            preparedStatement.setString(3, student.getProgramAsString());

            result = preparedStatement.executeUpdate();
            if (result > 0) {
                System.out.println("\tRecord succesfully added into student's table...!");
        %>
                <p>Record with student no <jsp:getProperty name="student" property="studNo" /> successfully created...!</p>
                <p>Details of the record are:</p>
                <p>Student ID: <jsp:getProperty name="student" property="studNo" /></p>
                <p>Name: <jsp:getProperty name="student" property="studName" /></p>
                <p>Program: <%= student.getProgramAsString() %></p>
        <%
            }

            System.out.println("Step 5: Close the database connection...!");
            connection.close();
            System.out.println("Database connection is closed...!");
    </body>
</html>
```

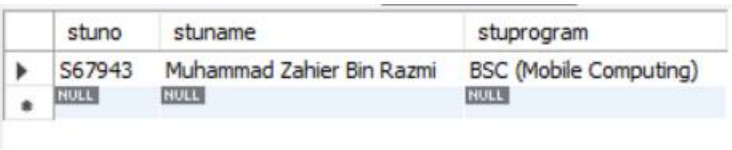
errorStudent.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page isErrorPage="true" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 3</title>
    </head>
    <body>
        <h1>Lab 6 : Task 3 - Perform creating and retrieving records via JSP page</h1>

        <form id="errorForm" action="insertStudent.jsp" method="post">
            <p>There is error occurred when inserting record...!</p>
            <p><jsp:expression> exception.getMessage() </jsp:expression></p>
            <button type="submit">Back</button>
        </form>
    </body>
</html>
```

Output:







	stuno	stuname	stuprogram
▶	S67943	Muhammad Zahier Bin Razmi	BSC (Mobile Computing)
*	NULL	NULL	NULL

Reflection:

1. What you have learnt from this exercise?

   From this exercise I have learned how to use JSP standard action, scriptlets and regular expression to insert records retrieve from MySQL database.

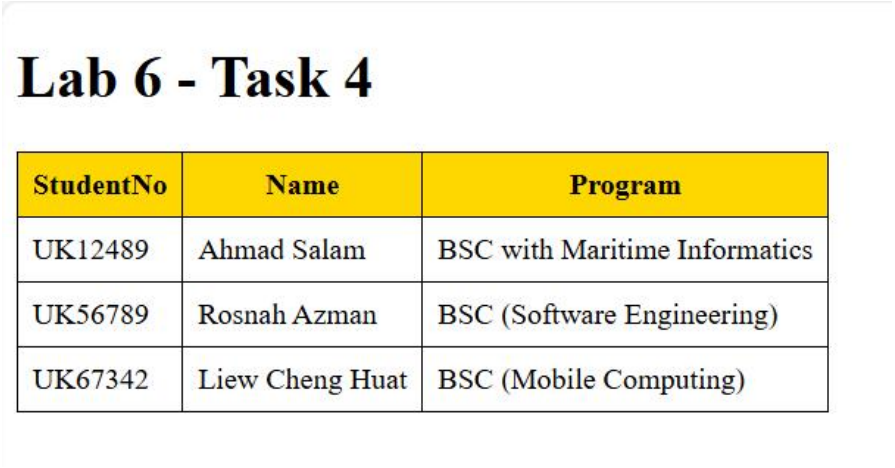
Task 4: Perform Retrieving Records Via JSP Page

Code:

queryStudent.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page import="java.sql.*" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <style>
            table {
                border-collapse: collapse;
            }

            td, th {
                border: 1px solid black;
                padding: 0.5rem;
            }

            th {
                background: gold;
            }
        </style>
        <title>Lab 6 | Task 4</title>
    </head>
    <body>
        <h1>Lab 6 - Task 4</h1>

        <table>
            <thead>
                <tr>
                    <th>StudentNo</th>
                    <th>Name</th>
                    <th>Program</th>
                </tr>
            </thead>
            <tbody>

        <%
            // Step 1: Load JDBC Driver
            Class.forName("com.mysql.cj.jdbc.Driver");

            // Step 2: Establish the connection
            String jdbcurl = "jdbc:mysql://localhost/lab6_task1";
            String username = "root";
            String password = "admin";

            Connection connection = DriverManager.getConnection(jdbcurl, username, password);

            // Step 3: Create a statement object
            Statement statement = connection.createStatement();

            // Step 4: Perform retrieve record from Student table
            String select_all_student = "SELECT * FROM student";
            ResultSet resultset = statement.executeQuery(select_all_student);

            while (resultset.next()) {
        %>
                <tr>
                    <td><%= resultset.getString(1) %></td>
                    <td><%= resultset.getString(2) %></td>
                    <td><%= resultset.getString(3) %></td>
                </tr>
        <%
            }
        %>

            </tbody>
        </table>
    </body>
</html>
```

Output:



Lab 6 - Task 4

StudentNo	Name	Program
UK12489	Ahmad Salam	BSC with Maritime Informatics
UK56789	Rosnah Azman	BSC (Software Engineering)
UK67342	Liew Cheng Huat	BSC (Mobile Computing)

Reflection:

1. What have you learnt from this exercise?

   From this exercise I have learned how to use Java Scriptlet to query a list of records.

2. Explain the differences when using Statement() and PreparedStatement().
   - String concatenation in Statement makes the code vulnerable to SQL injection attacks.
   - Prepared statements are generally more performant for repeated queries.
   - Prepared statements can improve code readability by separating the query logic from data manipulation

Task 5 : Create a Record Using JSP Model 1

Code:

Marathon.java

```
public class Marathon {
    private String icNo, name, category;

    public String getIcNo() {
        return icNo;
    }

    public void setIcNo(String icNo) {
        this.icNo = icNo;
    }

    public String getName() {
        return name;
    }

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

    public String getCategory() {
        return category;
    }

    public void setCategory(String category) {
        this.category = category;
    }
}
```

Database.java

```
package lab6.dao;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

/**
 *
 * @author Zahier
 */
public class Database {

    private static Connection connection = null;
    private static String url = "jdbc:mysql://localhost:3306/csm3023lab6";
    private static String username = "root";
    private static String password = "admin";
    private int result = 0;

    public static Connection getConnection() throws ClassNotFoundException {
        if (connection == null) {
            try {
                Class.forName("com.mysql.cj.jdbc.Driver");
                connection = DriverManager.getConnection(url, username, password);
                return connection;
            }
            catch (SQLException e) {
                e.printStackTrace();
            }
        }

        return connection;
    }

    public void closeConnection() throws ClassNotFoundException {
        try {
            connection.close();
        }
        catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```

MarathonDAO.java

```java
package lab6.dao;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import com.model.lab6.Marathon;

/**
 *
 * @author Zahier
 */
public class MarathonDAO {

    private Connection connection;
    private int result = 0;

    public MarathonDAO() throws ClassNotFoundException {
        connection = Database.getConnection();
    }

    public int addDetails(Marathon marathon) {
        try {
            String insertMarathon = "INSERT INTO marathon VALUES (?, ?, ?)";
            PreparedStatement preparedStatement = connection.prepareStatement(insertMarathon);

            System.out.println("IC No: " + marathon.getIcNo());
            System.out.println("Name: " + marathon.getName());
            System.out.println("Category: " + marathon.getCategory());


            // Parameters
            preparedStatement.setString(1, marathon.getIcNo());
            preparedStatement.setString(2, marathon.getName());
            preparedStatement.setString(3, marathon.getCategory());

            result = preparedStatement.executeUpdate();
        }
        catch (SQLException e) {
            e.printStackTrace();
        }
        return result;
    }
}
```

registerMarathon.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 5</title>
    </head>
    <body>
        <h1>Lab 6 - Task 5</h1>
        <form action="processMarathon.jsp" onsubmit="return validateInput()">
            <fieldset>
                <legend>Marathon Registration</legend>

                <table>
                    <tr>
                        <td><label for="icNo">IC No</label></td>
                        <td><input type="text" id="icNo" name="icNo" placeholder="E.g. 010203-04-0506" required></td>
                    </tr>
                    <tr>
                        <td><label for="name">Name</label></td>
                        <td><input type="text" id="name" name="name" placeholder="E.g. Ali bin Abu" required></td>
                    </tr>
                    <tr>
                        <td>Category</td>
                        <td>
                            <select id="category" name="category">
                                <option value="5 km">5 km</option>
```

```
                        <option value="7 km">7 km</option>
                        <option value="10 km">10 km</option>
                    </select>
                </td>
            </tr>
            <tr>
                <td>
                    <br>
                    <button type="reset">Cancel</button>
                    <button type="submit">Submit</button>
                </td>
            </tr>
        </table>
    </fieldset>
</form>

<script>
    function validateInput() {
        let valid = true; // Assume validity initially

        // IC number validation (adjust the pattern as needed)
        let icNoRegex = /^\d{2}\d{4}-\d{2}-\d{4}$/;
        let icNo = document.getElementById('icNo').value;
        if (!icNoRegex.test(icNo)) {
            alert('Invalid IC number format! (E.g. 010203-04-0506)');
            valid = false;
        }

        // Name validation (allow letters, spaces, hyphens, apostrophes)
        let nameRegex = /^[A-Za-z\s\-']+$/;
        let name = document.getElementById('name').value;
        if (!nameRegex.test(name)) {
            alert('Invalid name! (Only letters, spaces, hyphens, and apostrophes allowed)');
            valid = false;
        }

        return valid;
    }
</script>
</body>
</html>

</body>
</html>
```

processMarathon.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java"%>
<%@page import="java.sql.*" %>
<%@page import="com.model.lab6.Marathon" %>
<%@page import="lab6.dao.Database" %>
<%@page import="lab6.dao.MarathonDAO" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Task 5</title>
    </head>
    <body>
        <h1>Lab 6 - Task 5</h1>

        <!-- Create object Marathon -->
        <jsp:useBean id="marathon" class="com.model.lab6.Marathon" scope="request">
            <jsp:setProperty name="marathon" property="*" />
        </jsp:useBean>

        <%
            int result;

            // Step 1: Create Database object
            Database database = new Database();
            MarathonDAO marathonDAO = new MarathonDAO();
```

```
            // Step 2: Add the records
            result = marathonDAO.addDetails(marathon);

            // Step 3: Determine whether the transaction is success
            if (result > 0) {
                System.out.println("Record successfully added into marathon table...!");
        %>
                <p>Record with IC No <%= marathon.getIcNo() %> successfully created...!</p>
                <p>Details of the record are:</p>
                <p>IC No: <%= marathon.getIcNo() %></p>
                <p>Name: <%= marathon.getName() %></p>
                <p>Category: <%= marathon.getCategory() %></p>
        <%
            }

            // Step 4: Close database connection
            database.closeConnection();
        %>
    </body>
</html>
```

Output:

Lab 6 - Task 5

Marathon Registration

IC No 980825-12-5403

Name Muhammad Zahier Bin Raz

Category 7 km

Cancel Submit

Lab 6 - Task 5

Record with IC No 980825-12-5403 successfully created...!

Details of the record are:

IC No: 980825-12-5403

Name: Muhammad Zahier Bin Razmi

Category: 7 km

	icNo	name	category
▶	980825-12-5403	Muhammad Zahier Bin Razmi	7 km
*	NULL	NULL	NULL

Reflection:

1. What you have learnt from this exercise?

   From this exercise I have learned how to use JavaBeans to perform SQL transaction.

2. Describe the benefits of using JavaBeans.

   JavaBeans offer several advantages for developers. They promote code reusability by encapsulating data and functionality within self-contained objects. This allows the same bean to be used in various parts of an application. Additionally, JavaBeans enforce data access through getters and setters, promoting data protection and adherence to encapsulation principles. Furthermore, their standardized design makes them interoperable with various Java frameworks and tools, simplifying development and integration.

Exercise: Implement User Login

Code:

User.java

```
public class User {

    private String username, password, firstname, lastname;

    public String getUsername() {
        return username;
    }

    public void setUsername(String username) {
        this.username = username;
    }

    public String getPassword() {
        return password;
    }

    public void setPassword(String password) {
        this.password = password;
    }

    public String getFirstname() {
        return firstname;
    }
    public void setFirstname(String firstname) {
        this.firstname = firstname;
    }

    public String getLastname() {
        return lastname;
    }

    public void setLastname(String lastname) {
        this.lastname = lastname;
    }
}
```

UserDAO.java

```
package lab6.dao;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import com.model.lab6.User;

/**
 *
 * @author Zahier
 */
public class UserDAO {

    private Connection connection;
    private int result = 0;

    public UserDAO() throws ClassNotFoundException {
        connection = Database.getConnection();
    }

    public int addDetails(User user) {
        try {
            String insertUser = "INSERT INTO userprofile VALUES (?, ?, ?, ?)";
            PreparedStatement preparedStatement = connection.prepareStatement(insertUser);

            preparedStatement.setString(1, user.getUsername());
            preparedStatement.setString(2, user.getPassword());
            preparedStatement.setString(3, user.getFirstname());
            preparedStatement.setString(4, user.getLastname());
```

```
            result = preparedStatement.executeUpdate();
        }
        catch (SQLException e) {
            e.printStackTrace();
        }

        return result;
    }

    public User getUser(String username, String password) {
        try {
            String selectUser = "SELECT * FROM user WHERE username = ? AND password = ?";
            PreparedStatement preparedStatement = connection.prepareStatement(selectUser);

            preparedStatement.setString(1, username);
            preparedStatement.setString(2, password);

            ResultSet resultSet = preparedStatement.executeQuery();

            if (resultSet.next()) {
                User user = new User();
                user.setUsername(resultSet.getString("username"));
                user.setPassword(resultSet.getString("password"));
                user.setFirstname(resultSet.getString("firstname"));
                user.setLastname(resultSet.getString("lastname"));
                return user;
            }
        }
        catch (SQLException e) {
            e.printStackTrace();
        }
        return null; // Indicate user not found
    }
}
```

insertUser.html

```
<!DOCTYPE html>
<html>
    <head>
        <title>Lab 6 | Exercise</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <h1>Lab 6 - Exercise</h1>

        <form action="processUser.jsp" onsubmit="return validateInput()">
            <fieldset>
                <legend>User Registration</legend>

                <table>
                    <tr>
                        <td><label for="username">Username</label></td>
                        <td><input type="text" id="username" name="username" placeholder="Enter username" required></td>
                    </tr>
                    <tr>
                        <td><label for="password">Password</label></td>
                        <td><input type="password" id="password" name="password" placeholder="Enter password" required></td>
                    </tr>
                    <tr>
                        <td><label for="firstname">First name</label></td>
                        <td><input type="text" id="firstname" name="firstname" placeholder="E.g. John" required></td>
                    </tr>
                    <tr>
                        <td><label for="lastname">Last name</label></td>
                        <td><input type="text" id="lastname" name="lastname" placeholder="E.g. Smith" required></td>
                    </tr>
```

```
                    </tr>
                    <tr>
                        <td>
                            <br>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </fieldset>
        </form>

        <script>
            function validateInput() {
                let valid = true; // Assume validity initially

                // Username validation
                let username = document.getElementById('username').value;
                if (username.length > 15) {
                    alert('Username cannot exceed 15 characters!');
                    valid = false;
                }

                // Password validation
                let password = document.getElementById('password').value;
                if (password.length > 10) {
                    alert('Password cannot exceed 10 characters!');
                    valid = false;
                }
                // First name validation
                let firstName = document.getElementById('firstname').value;
                if (firstName.length > 50) {
                    alert('First name cannot exceed 50 characters!');
                    valid = false;
                }

                // Last name validation
                let lastName = document.getElementById('lastname').value;
                if (lastName.length > 50) {
                    alert('Last name cannot exceed 50 characters!');
                    valid = false;
                }

                return valid;
            }
        </script>
    </body>
</html>
```

processUser.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java" %>
<%@page import="com.model.lab6.User" %>
<%@page import="lab6.dao.Database" %>
<%@page import="lab6.dao.UserDAO" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Exercise</title>
    </head>
    <body>
        <h1>Lab 6 - Exercise</h1>

        <jsp:useBean id="user" class="com.model.lab6.User" scope="request">
            <jsp:setProperty name="user" property="*" />
        </jsp:useBean>

        <%
            int result;

            Database database = new Database();
            UserDAO userDAO = new UserDAO();

            result = userDAO.addDetails(user);

            if (result > 0) {
        %>
                <p>Record with username <%= user.getUsername() %> successfully created...!</p>
                <p>Details of the record are:</p>
                <p>Username: <%= user.getUsername() %></p>
```

```
                <p>First name: <%= user.getFirstname() %> </p>
                <p>Last name: <%= user.getLastname() %> </p>
                <button onclick="redirectToLogin()">Proceed to Log In</button>
        <%
            }
            database.closeConnection();
        %>

        <script>
            function redirectToLogin() {
                window.location.href = "login.jsp";
            }
        </script>
    </body>
</html>
```

Login.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Exercise</title>
    </head>
    <body>
        <h1>Lab 6 - Exercise</h1>

        <%
            String errorMessage = (String) session.getAttribute("errorMessage");
            if (errorMessage != null) {
                session.removeAttribute("errorMessage"); // Remove message after display
        %>
                <p style="color: red;"><%= errorMessage %></p>
        <%
            }
        %>

        <form action="doLogin.jsp" onsubmit="return validateInput()">
            <fieldset>
                <legend>User Log In</legend>

                <table>
                    <tr>
                        <td><label for="username">Username</label></td>
                        <td><input type="text" id="username" name="username" placeholder="Enter username" required=""></td>
                    </tr>
                    <tr>
                        <td><label for="password">Password</label></td>
                        <td><input type="password" id="password" name="password" placeholder="Enter password" required=""></td>
                    </tr>
                    <tr>
                        <td>
                            <br>
                            <button type="reset">Cancel</button>
                            <button type="submit">Submit</button>
                        </td>
                    </tr>
                </table>
            </fieldset>
        </form>

        <script>
            function validateInput() {
                let valid = true; // Assume validity initially

                // Username validation
                let username = document.getElementById('username').value;
                if (username.length > 15) {
                    alert('Username cannot exceed 15 characters!');
                    valid = false;
                }

                // Password validation
                let password = document.getElementById('password').value;
                if (password.length > 10) {
                    alert('Password cannot exceed 10 characters!');
                    valid = false;
                }

                return valid;
            }
        </script>
    </body>
</html>
```

doLogin.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page language="java" %>
<%@page import="com.model.lab6.User" %>
<%@page import="lab6.dao.Database" %>
<%@page import="lab6.dao.UserDAO" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Exercise</title>
    </head>
    <body>
        <%
            String username = request.getParameter("username");
            String password = request.getParameter("password");

            out.print("<p>" + username + "</p>");
            out.print("<p>" + password + "</p>");

            Database database = new Database();

            UserDAO userDAO = new UserDAO();

            User user = userDAO.getUser(username, password);

            database.closeConnection();

            if (user != null) {
                // Login successful, update session and redirect to main.jsp
                session.setAttribute("user", user);
                response.sendRedirect("main.jsp");
            }
            else {
                // Login failed, redirect to login.jsp with error message
                session.setAttribute("errorMessage", "Invalid username or password!");
                response.sendRedirect("login.jsp");
            }
        %>
    </body>
</html>
```

Main.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="com.model.lab6.User" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Lab 6 | Exercise</title>
    </head>
    <body>
        <%
            // Retrieve user object from session
            User user = (User) session.getAttribute("user");

            if (user != null) {
        %>
            <h1>Welcome <%= user.getUsername() %> to the Main Page!</h1>
            <p>Your details:</p>
            <p>Username: <%= user.getUsername() %></p>
            <p>First name: <%= user.getFirstname() %></p>
            <p>Last name: <%= user.getLastname() %></p>
            <button onclick="logOut()">Log Out</button>
        <%
            }
            else {
                out.println("<p>You are not logged in! Please log in first.</p>");
                response.sendRedirect("login.jsp"); // Redirect if not logged in
            }
        %>

        <script>
            function logOut() {
                window.location.href='login.jsp';
            }
        </script>
    </body>
</html>
```

Output:

Lab 6 - Exercise

User Registration

Username: zahier

Password: ••••

First name: Muhammad

Last name: Zahier

Cancel Submit

Lab 6 - Exercise

Record with username zahier successfully created...!

Details of the record are:

Username: zahier

First name: Muhammad

Last name: Zahier

Proceed to Log In

Lab 6 - Exercise

User Log In

Username: zahier

Password: ••••

Cancel Submit

	username	password	firstname	lastname
▶	zahier	1234	Muhammad	Zahier
*	NULL	NULL	NULL	NULL