



Universiti Malaysia Terengganu

Faculty of Computer Sciences and Mathematics

Web Based Application Development

CSM3023

Lab Report 6

Prepared for:

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15th May 2024

Bachelor of Computer Science (Mobile Computing) with Honors

Semester II 2023/2024

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

- Objective: Write a JSP that can insert data to MYSQL database as “Welcome to access MySQL database with JSP.!” and also display steps of how to connect with MYSQL database.
- Code:
 - SampleInsertionRecord.jsp

```
<!--
    Document    : SampleInsertionRecord
    Created on  : 15 May 2024, 2:24:05 pm
    Author     : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@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.cj.jdbc.Driver");
            out.println("Step 1: MySQL Driver loaded...!");
        %>
        <br>
        <%
            // Step 2: Establish the connection
            String jdbcurl =
"jdbc:mysql://localhost:3306/csm3023lab6";
            String username = "root";
            String password = "admin";

            Connection connection =
DriverManager.getConnection(jdbcurl, username, password);
            out.println("Step 2: Database is connected...!");
        %>
        <br>
        <%
            // Step 3: Create a PreparedStatement object
```

```

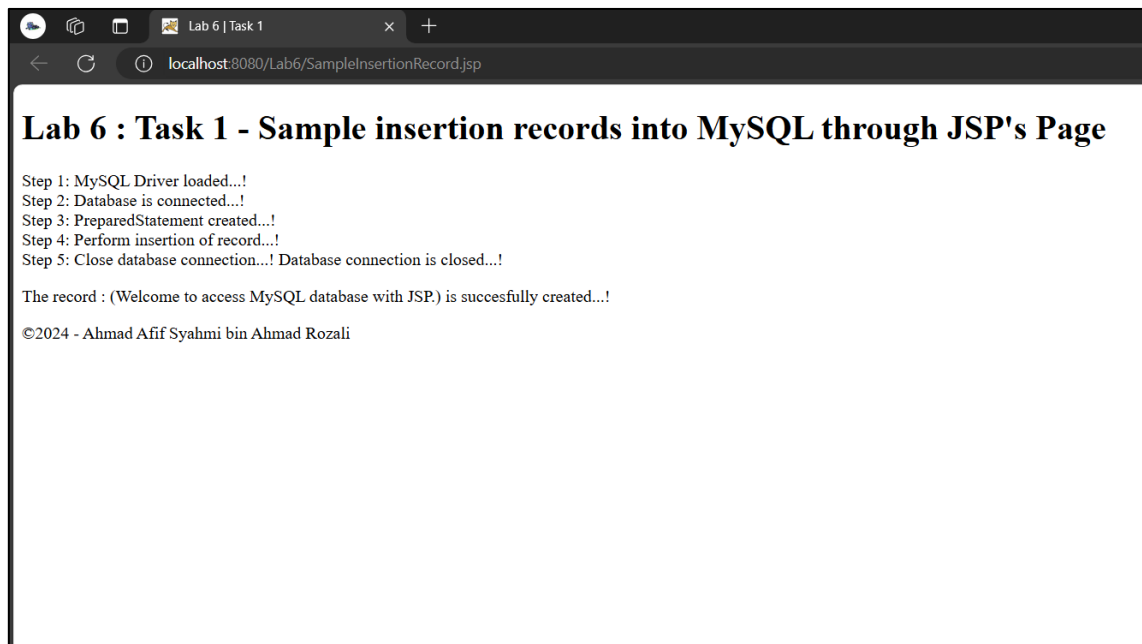
String insertQry = "INSERT INTO first_table VALUES
(?)";
PreparedStatement preparedStatement =
connection.prepareStatement(insertQry);
    out.println("Step 3: PreparedStatement
created...!");
    %>
    <br>
    <%
        // Step 4: Assign each value to respective columns
for first_table
        String name = "Welcome to access MySQL database with
JSP.";
        preparedStatement.setString(1, name);
        out.println("Step 4: Perform insertion of
record...!");

        result = preparedStatement.executeUpdate();
    %>
    <br>
    <%
        if (result > 0) {
            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
        connection.close();
    %>

    <footer>
        &copy;2024 - Ahmad Afif Syahmi bin Ahmad Rozali
    </footer>
</body>
</html>

```

- Output:



Task 2 : Create Records via JSP Page

- Objective: Using JSP to insert records retrieve from MySQL database.
- Code:
 - insertAuthor.jsp

```
<!--
    Document    : insertAuthor
    Created on  : 15 May 2024, 3:13:16 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@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>
                    <tr>
                        <td><label for="city">City</label></td>
                        <td><input type="text" name="city"
id="city" placeholder="Enter your city"></td>
                    </tr>
                </table>
            </fieldset>
        </form>
    </body>
</html>
```

```

        <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 - Ahmad Afif Syahmi bin Ahmad Rozali
</footer>
</body>
</html>

```

○ Author.java

```

package lab6.javabeans;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
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

```
<!--
    Document    : processAuthor
    Created on  : 15 May 2024, 3:31:39 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@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:3306/csm3023lab6";
            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...!");
            }
        %>
    </body>
</html>
```



```

        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 - Ahmad Afif Syahmi bin Ahmad Rozali
</footer>
</body>
</html>

```

- Output:

Lab 6 : Task 2 - Perform creating and retrieving records via JSP page

Author Registration

Author No	UK00101
Name	Afif Syahmi
Address	UMT
City	Kuala Nerus
State	Terengganu
Zip	21300

Cancel Submit

©2024 - Ahmad Afif Syahmi bin Ahmad Rozali

Lab 6 | Task 2

localhost:8080/Lab6/processAuthor.jsp?authorNo=UK00101&name=Afif+Syahmi&address=UMT&city=Kuala+Nerus&state=Terengganu&zip=21300

Lab 6 : Task 2 - Perform creating and retrieving records via JSP page

Record successfully added into Author table...!

Record with author no UK00101 successfully created..!

Details of the record are:

Name: Afif Syahmi

Address: UMT

City: Kuala Nerus

State: Terengganu

Zip: 21300

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Result Grid						
	authorNo	name	address	city	state	zip
▶	UK00101	Afif Syahmi	UMT	Kuala Nerus	Terengganu	21300
•	NULL	NULL	NULL	NULL	NULL	NULL

- Reflection:

- 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.

- 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

- Objective: Using JSP Standard Action, scriptlets and regular expression to insert records retrieve from MySQL database.
- Code:
 - Student.java

```
package lab6.javabeans;
/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
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

```

<!--
    Document    : insertStudent
    Created on  : 15 May 2024, 10:52:07 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
-->

<%@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

```

<!--
    Document    : processStudent
    Created on  : 15 May 2024, 10:16:32 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@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="lab6.javabeans.Student"
scope="request">
        <jsp:setProperty name="student" property="*" />
    </jsp:useBean>

    <%
        int result;

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

        String jdbcurl =
"jdbc:mysql://localhost:3306/csm3023lab6";
        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>
```

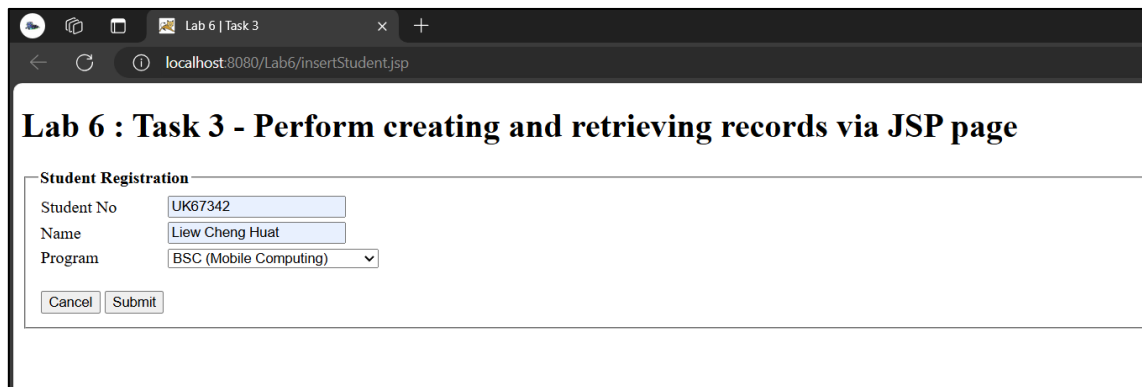
- errorStudent.jsp

```
<%--
    Document    : errorStudent
    Created on  : 15 May 2024, 10:41:51 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@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:



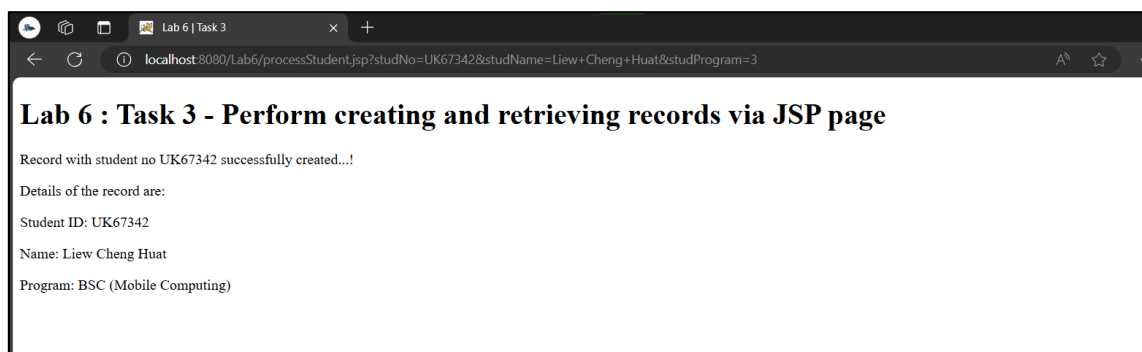
Lab 6 : Task 3 - Perform creating and retrieving records via JSP page

Student Registration

Student No:

Name:

Program:



Lab 6 : Task 3 - Perform creating and retrieving records via JSP page

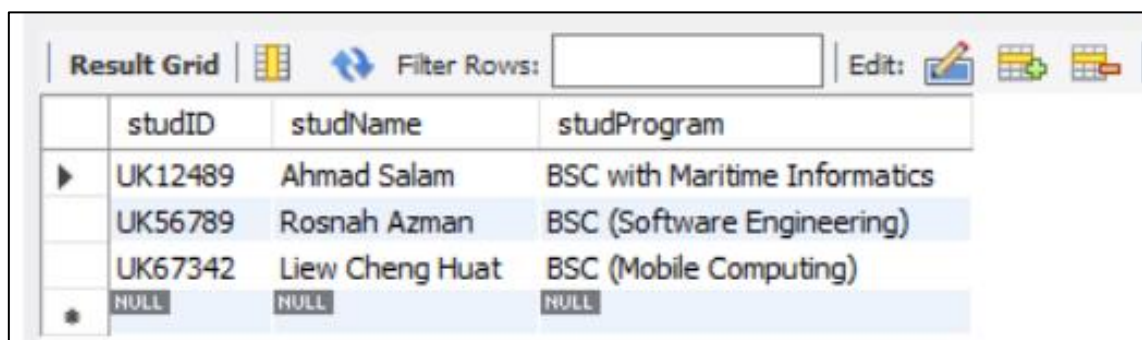
Record with student no UK67342 successfully created...!




Details of the record are:

Student ID: UK67342

Name: Liew Cheng Huat

Program: BSC (Mobile Computing)



Result Grid | Filter Rows: | Edit:   

	studID	studName	studProgram
▶	UK12489	Ahmad Salam	BSC with Maritime Informatics
	UK56789	Rosnah Azman	BSC (Software Engineering)
	UK67342	Liew Cheng Huat	BSC (Mobile Computing)
✱	NULL	NULL	NULL

- Reflection:

- 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

- Objective: Use Java Scriptlet to query a list of records.
- Code:
 - queryStudent.jsp

```
<!--
  Document   : queryStudent
  Created on : 16 May 2024, 12:00:29 am
  Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@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>ISBNNo</th>
          <th>Author</th>
          <th>Title</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:3306/csm3023lab6";
        String username = "root";
        String password = "admin";

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

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

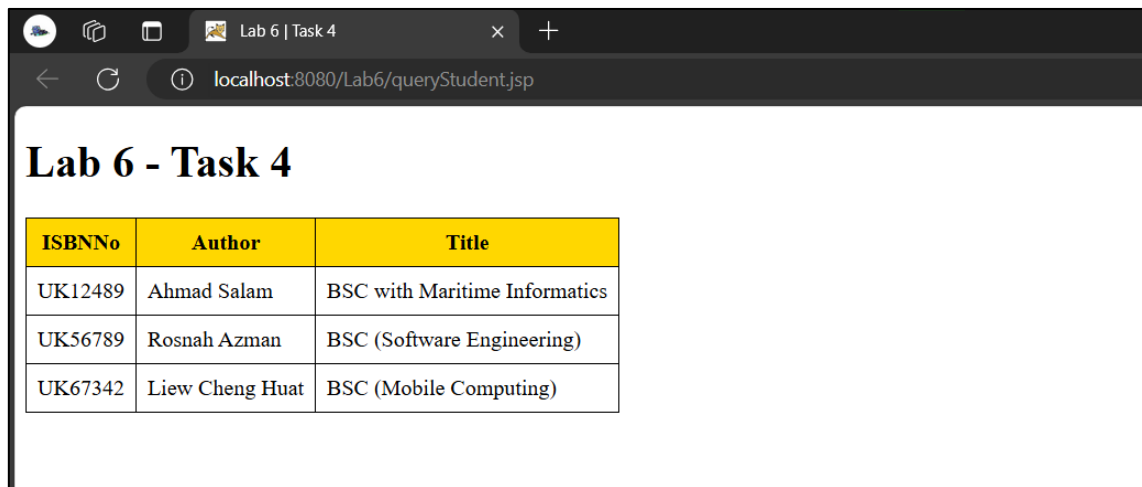
        // Step 4: Perform retrieve record from Student
table
        String select_all_student = "SELECT * FROM student";
        ResultSet resultset =
statement.executeQuery(select_all_student);

        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:



ISBNNo	Author	Title
UK12489	Ahmad Salam	BSC with Maritime Informatics
UK56789	Rosnah Azman	BSC (Software Engineering)
UK67342	Liew Cheng Huat	BSC (Mobile Computing)

- Reflection:

- What have you learnt from this exercise?

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

- 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

- Objective: Use JavaBeans to perform SQL transaction.
- Code:
 - Marathon.java

```
package lab6.javabeans;

/**
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
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 Ahmad Afif Syahmi bin Ahmad Rozali
 */
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

```

package lab6.dao;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import lab6.javabeans.Marathon;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */

```

```

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

```

<!--
    Document    : registerMarathon
    Created on  : 16 May 2024, 12:42:29 am
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@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>

```

- processMarathon.jsp

```

<!--
    Document    : processMarathon
    Created on  : 16 May 2024, 1:06:39 am
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="java.sql.*" %>
<%@page import="lab6.javabeans.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="lab6.javabeans.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>

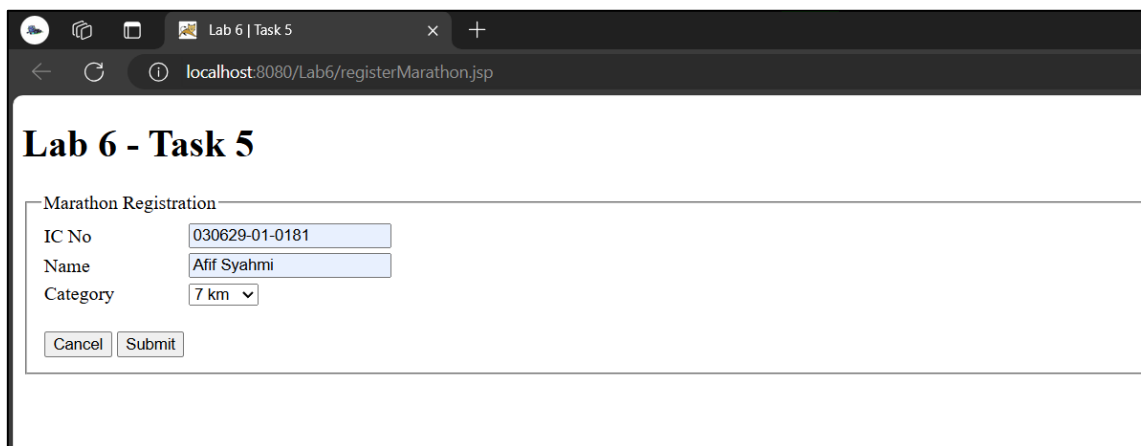
        <%
        }

// Step 4: Close database connection
database.closeConnection();

    %>
</body>
</html>

```

- Output:



Lab 6 - Task 5

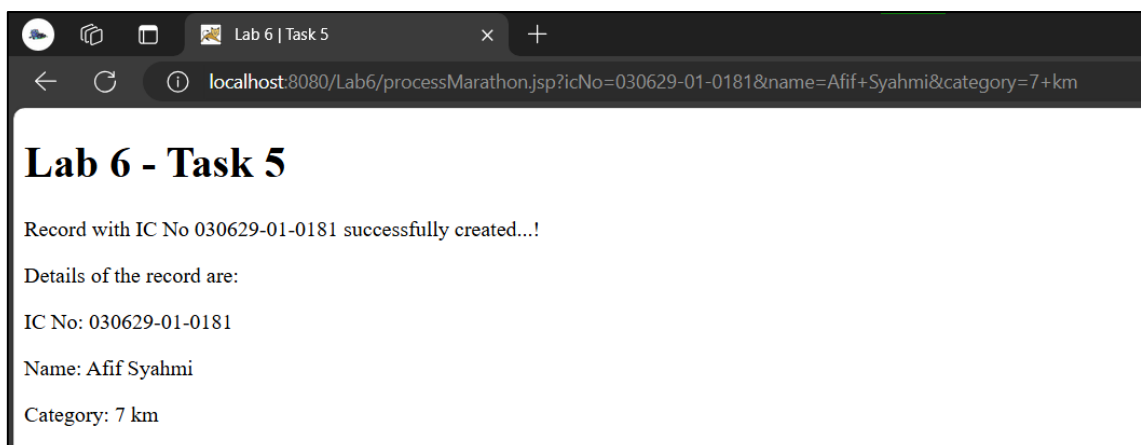
Marathon Registration

IC No: 030629-01-0181

Name: Afif Syahmi

Category: 7 km

Cancel Submit



Lab 6 - Task 5

Record with IC No 030629-01-0181 successfully created...!

Details of the record are:

IC No: 030629-01-0181

Name: Afif Syahmi

Category: 7 km

<div> <div>Result Grid</div> <div></div> <div></div> <div>Filter Rows:</div> <div></div> </div>			
	idNo	name	category
▶	030629-01-0181	Aff Syahmi	7 km
●	NULL	NULL	NULL

- Reflection:

- What you have learnt from this exercise?

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

- 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

```
package lab6.javabeans;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
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 lab6.javabeans.User;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
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 user 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>
        <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

```

<!--
    Document    : processUser
    Created on  : 16 May 2024, 7:11:07 am
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
-->

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="lab6.javabeans.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="lab6.javabeans.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();
            }
        </%
    </body>
</html>

```



```

    %>

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

```

○ login.jsp

```

<!--
    Document    : login
    Created on  : 16 May 2024, 7:11:16 am
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@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

```

<!--
    Document    : doLogin
    Created on  : 16 May 2024, 7:11:28 am
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="lab6.javabeans.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

```

<%--
  Document    : main
  Created on  : 16 May 2024, 7:11:39 am
  Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@page import="lab6.javabeans.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");

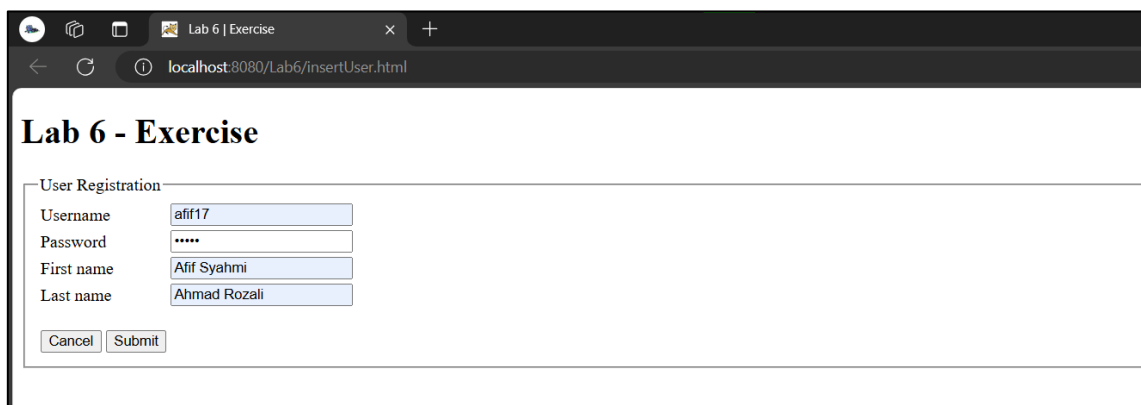
    if (user != null) {
  Page!</h1>
      <h1>Welcome <%= user.getUsername() %> to the Main
      <p>Your details:</p>
      <p>Username: <%= user.getUsername() %></p>
      <p>First name: <%= user.getFirstname() %></p>
      <p>Last name: <%= user.getLastname() %></p>
      <button onclick="logout()">Log 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:



The screenshot shows a web browser window with the address bar displaying 'localhost:8080/Lab6/insertUser.html'. The page title is 'Lab 6 - Exercise'. Below the title is a form titled 'User Registration'. The form contains four input fields: 'Username' with the value 'afif17', 'Password' with the value '****', 'First name' with the value 'Afif Syahmi', and 'Last name' with the value 'Ahmad Rozali'. At the bottom of the form are two buttons: 'Cancel' and 'Submit'.

Lab 6 | Exercise

localhost:8080/Lab6/processUser.jsp?username=afif17&password=12345&firstname=Afif+Syahmi&lastname=Ahmad+Rozali

Lab 6 - Exercise

Record with username afif17 successfully created...!

Details of the record are:

Username: afif17

First name: Afif Syahmi

Last name: Ahmad Rozali

Proceed to Log In

Lab 6 | Exercise

localhost:8080/Lab6/login.jsp

Lab 6 - Exercise

User Log In

Username

afif17

Password

.....

Cancel

Submit

Result Grid

Filter Rows:

Edit:

	username	password	firstname	lastname
▶	afif17	12345	Afif Syahmi	Ahmad Rozali
	john17	123	John	Smith
✱	NULL	NULL	NULL	NULL

