UNIVERSITI MALAYSIA TERENGGANU

FACULTY OF COMPUTER SCIENCE AND MATHEMATICS

CSM3023 – WEB BASED APPLICATION DEVELOPMENT

LAB REPORT 6 – JSP : SAVING AND RETRIEVING

DATA FROM DATABASE

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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.

SampleInsertionRecord.jsp

```jsp
1  <%--
2      Document    : SampelInsertionRecord
3      Created on  : May 21, 2024, 6:12:27 PM
4      Author      : User
5  --%>
6
7  <%@page contentType="text/html" pageEncoding="UTF-8"%>
8  <%@page language="java"%>
9  <%@page import="java.sql.*"%>
10 <!DOCTYPE html>
11 <html>
12     <head>
13         <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
14         <title>JSP Page</title>
15     </head>
16     <body>
17         <h1>Lab 6 - Task 1 - Sample Insertion records into MySQL through JSP's page</h1>
18         <%
19             int result;
20
21             //Step 1: Load JDBC driver...
22             Class.forName("com.mysql.cj.jdbc.Driver");
23             out.println("Step 1: MySQL driver loaded...!");
24         %>
25         <br>
26         <%
27             //Step 2: Establish the connection...
28             String myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
29             Connection myConnection = DriverManager.getConnection(myURL, "root", "admin");
30             out.println("Step 2: Database is connected..!");
31         %>
```

```
32          <br>
33          <%
34              //Step 3: Create a PreparedStatement object..
35              out.println("Step 3: Prepared Statements created...!");
36
37              //Prepared SQL Query as a String...
38              String sInsertQry = "INSERT INTO first_table VALUES(?)";
39
40              //Call method preparedStatement
41              PreparedStatement myPS = myConnection.prepareStatement(sInsertQry);
42          %>
43          <br>
44          <%
45              //Assign each value to respective columns for Books's table.. (C-Create)
46              out.println("Step 4: Perform insertion of record..!");
47              String name = "Welcome to access MySQL database with JSP....!";
48              myPS.setString(1, name);
49
50              result = myPS.executeUpdate();
51
52              if (result > 0){
53          %>
54          <br>
55          <%
56                  out.println("Step5: Close data connection...!");
57
58                  out.println(" ");
59                  out.println("Database connection is closed...!");
60
61                  out.print("<p>" + "The record : (" + name + ") is successfully created...!" + "</p>");
62              }
63              //Step 5: Close database connection...!
64                  myConnection.close();
65          %>
66      </body>
67 </html>
```

Create database.
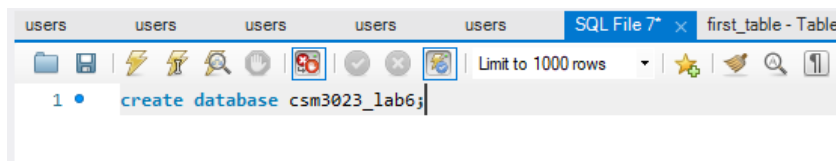
Create first_table table

The output

Lab 6 - Task 1 - Sample Insertion records into MySQL through JSP's page
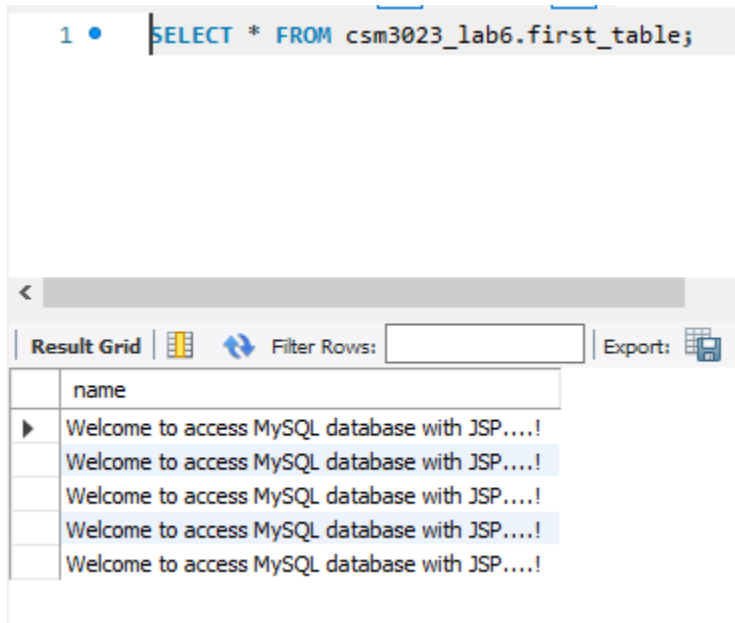
Step 1: MySQL driver loaded...!
Step 2: Database is connected..!
Step 3: Prepared Statements created...!
Step 4: Perform insertion of record..!
Step5: Close data connection...! Database connection is closed...!

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

```
1 •      SELECT * FROM csm3023_lab6.first_table;
```

Result Grid | Filter Rows: | Export: |

name
▶ Welcome to access MySQL database with JSP....!
Welcome to access MySQL database with JSP....!
Welcome to access MySQL database with JSP....!
Welcome to access MySQL database with JSP....!
Welcome to access MySQL database with JSP....!

TASK 2: CREATE RECORDS VIA JSP PAGE

Objective :

- Using JSP to insert records retrieve from MySQL database.

insertAuthor.jsp

```jsp
<%--
    Document    : insertAuthor
    Created on  : May 21, 2024, 6:16:06 PM
    Author      : User
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h1>Lab 6 - Task 2 - Perform creating and retrieving records via JSP page</h1>
        <fieldset>
            <legend>Author Registration</legend>
            <form action="processAuthor.jsp" method="post">
                <table>
                    <tr>
                        <td>
                            <label for="authno">Author No</label>
                        </td>
                        <td>
                            <input type="text" id="authno" name="authno" placeholder="E.g. UKXXXXX">
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <label for="name">Name</label>
                        </td>
                        <td>
                            <input type="text" id="NAME" name="NAME" placeholder="Enter your name">
                        </td>
                    </tr>
```

```html
                        <tr>
                            <td>
                                <label for="address">Address</label>
                            </td>
                            <td>
                                <input type="text" id="address" name="address" placeholder="Enter your address">
                            </td>
                        </tr>
                        <tr>
                            <td>
                                <label for="city">City</label>
                            </td>
                            <td>
                                <input type="text" id="city" name="city" placeholder="Enter your city">
                            </td>
                        </tr>
                        <tr>
                            <td>
                                <label for="state">State</label>
                            </td>
                            <td>
                                <input type="text" id="state" name="state" placeholder="Enter your state">
                            </td>
                        </tr>
                        <tr>
                            <td>
                                <label for="zip">Zip</label>
                            </td>
                            <td>
                                <input type="text" id="zip" name="zip" placeholder="Enter your zip">
                            </td>
                        </tr>
                        <tr>
                            <td>
                                <button type="submit" value="Submit">Submit</button>
                                <button type="reset" value="Reset">Cancel</button>
                            </td>
                        </tr>
                    </table>
                </form>
            </fieldset>
            <footer><p>&copy;2024-Harinatul Muflihun</p></footer>
        </body>
    </html>
```

Author.java

```java
package lab6.com;
/**
 *
 * @author User
 */
public class Author {
    private String authno;
    private String NAME;
    private String address;
    private String city;
    private String state;
    private String zip;

    public String getAuthno() {
        return authno;
    }

    public void setAuthno(String authno) {
        this.authno = authno;
    }

    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
7    <%@page contentType="text/html" pageEncoding="UTF-8"%>
8    <%@page language="java"%>
9    <%@page import="java.sql.*"%>
10   <!DOCTYPE html>
11   <html>
12       <head>
13           <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
14           <title>JSP Page</title>
15       </head>
16       <body>
17           <h1>Lab 6 - Task 1 - Perform and retrieving records via JSP page</h1>
18           <jsp:useBean id="myAuthor" class="lab6.com.Author" scope="request"/>
19
20           <jsp:setProperty name="myAuthor" property="*"/>
21
22           <%
23               int result;
24
25               Class.forName("com.mysql.cj.jdbc.Driver");
26
27               String myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
28               Connection myConnection = DriverManager.getConnection(myURL, "root", "admin");
29
30               String sInsertQry = "INSERT INTO author(authno, NAME, address, city, state, zip) VALUES(?, ?, ?, ?, ?, ?)";
31
32               PreparedStatement myPS = myConnection.prepareStatement(sInsertQry);
33
34               myPS.setString(1, myAuthor.getAuthno());
35               myPS.setString(2, myAuthor.getNAME());
36               myPS.setString(3, myAuthor.getAddress());
37               myPS.setString(4, myAuthor.getCity());
38               myPS.setString(5, myAuthor.getState());
39               myPS.setString(6, myAuthor.getZip());
40
41               result = myPS.executeUpdate();
42               if (result > 0){
43                   out.println("\tRecord successfully added into Author table...!");
44                   out.print("<p>" + "Record with author no " +myAuthor.getAuthno()
45                           + " successfully created..!" + "</p>");
46                   out.print("<p>" + "Details of record are; " + "</p>");
47                   out.print("<p>Name : " + myAuthor.getNAME() + "</p>");
48                   out.print("<p>Address : " + myAuthor.getAddress() + "</p>");
49                   out.print("<p>City : " + myAuthor.getCity() + "</p>");
50                   out.print("<p>State : " + myAuthor.getState() + "</p>");
51                   out.print("<p>Zip : " + myAuthor.getZip() + "</p>");
52               }
53               //Step5: close database connection..!
54               System.out.println("Step 5: Close database connection..!");
55               myConnection.close();
56               System.out.println(" ");
57               System.out.println("Database connection is closed..!");
58           %>
59       </body>
60   </html>
```

The output :

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

┌─Author Registration─────────────────────────┐
│ Author No   │ UK9875   │
│ Name   │ Sufian Suhaimi   │
│ Address   │ Lot PT 260   │
│ City   │ Segamat   │
│ State   │ Johor   │
│ Zip   │ 98500   │
│ [Submit] [Cancel]   │
└──┘

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Lab 6 - Task 1 - Perform and retrieving records via JSP page

Record successfully added into Author table...!

Record with author no UK9875 successfully created..!

Details of record are;

Name : Sufian Suhaimi

Address : Lot PT 260

City : Segamat

State : Johor

Zip : 98500

The database

```
1 •   SELECT * FROM csm3023_lab6.author;
```

Result Grid | Filter Rows: | Edit: | Export/I

authno	NAME	address	city	state	zip
UK0256	Mohd Razali Abdullah	LOT 256	Merlimau	Melaka	20564
UK9875	Sufian Suhaimi	Lot PT 260	Segamat	Johor	98500
UL3103	Muhammad Hiril	NO56	Johor Baharu	Johor	86230

REFLECTION

1. What have you learn from this exercise?
- From this exercise I learnt how to used JSP to insert records and retrieve data from MySQL database.

2. Define step by step before you successfully perform the transaction in a database.
- Load JDBC driver
- Establish the connection
- Create a PreparedStatement object
- Execute the query
- Close database connection.

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

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>JSP Page</title>
    </head>
    <body>
        <fieldset>
            <legend>Student Registration</legend>
            <form action="processStudent.jsp" method="post">
                <table>
                    <tr>
                        <td>
                            <label for="stuno">Student No</label>
                        </td>
                        <td>
                            <input type="text" id="stuno" name="stuno" placeholder="E.g.: UKXXXXXX">
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <label for="name">Name</label>
                        </td>
                        <td>
                            <input type="text" id="name" name="name" placeholder="Enter your name">
                        </td>
                    </tr>
                    <tr>
                        <td><label for="program">Program</label></td>
                        <td>
                            <select id="program" name="program">
                                <option value="BSc. Soft. Eng.">BSc. Soft. Eng.</option>
                                <option value="BSc. with IM">BSc. with IM</option>
                                <option value="BSc. in Networking">BSc. in Networking</option>
                                <option value="BSc. in Robotics">BSc. in Robotics</option>
                            </select>
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <button type="submit" value="Submit">Submit</button>
                            <button type="reset" value="Reset">Cancel</button>
                        </td>
                    </tr>
                </table>
            </form>
        </fieldset>
        <footer>
            <p>&copy;2024-Harinatul Muflihun</p>
        </footer>
    </body>
</html>
```

Student.java

```java
package lab6.com;

import java.util.regex.Matcher;
import java.util.regex.Pattern;

/**
 *
 * @author User
 */
public class Student {
    private String stuno;
    private String name;
    private String program;

    public String getStuno() {
        Pattern pt = Pattern.compile("[A-Z0-9]*");
        Matcher mt = pt.matcher(stuno);
        boolean bl = mt.matches();
        String valid = "";
        String invalid = "Invalid input please reenter!";
        if(bl == true){
            valid = stuno;
        }else{
            valid = invalid;
        }
        return valid;
    }

    public void setStuno(String stuno) {
        this.stuno = stuno;
    }

    public String getName() {
        return name;
    }

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

    public String getProgram() {
        return program;
    }

    public void setProgram(String program) {
        this.program = program;
    }
}
```

processStudent.jsp

```jsp
7   <%@page contentType="text/html" pageEncoding="UTF-8"%>
8   <%@page language="java"%>
9   <%@page import="java.sql.*"%>
10  <%@page errorPage="errorStudent.jsp"%>
11  <!DOCTYPE html>
12  <html>
13      <head>
14          <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
15          <title>JSP Page</title>
16      </head>
17      <body>
18          <jsp:useBean id="myStudent" class="lab6.com.Student" scope="request"/>
19          <jsp:setProperty name="myStudent" property="*"/>
20
21          <%
22              int result;
23
24              //Step 1: Load JDBC driver..
25              Class.forName("com.mysql.cj.jdbc.Driver");
26              System.out.println("Step 1: MySQL driver loaded...!");
27
28              //Step 2: Establish the connection
29              String myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
30              Connection myConnection = DriverManager.getConnection(myURL, "root", "admin");
31              System.out.println("Step 2: Database is connected...!");
32
33              //Step 3: Create a PreparedStatement object...
34              System.out.println("Step3: Prepared Statements created...!");
35              String sInsertQry = "INSERT INTO student(stuno, stuname, stuprogram) VALUES(?, ?, ?)";
36              System.out.println("\tSQL Query: " + sInsertQry);
37
38              //Call method preparedStatement
39              PreparedStatement myPS = myConnection.prepareStatement(sInsertQry);
40
41              //Assign each value to respective columns for Student's table.. (C-Create)
42              System.out.println("Step 4 : Perform insertion of record...!");
43              myPS.setString(1, myStudent.getStuno());
44              myPS.setString(2, myStudent.getName());
45              myPS.setString(3, myStudent.getProgram());
46
47              result = myPS.executeUpdate();
48              if (result > 0){
49                  out.println("\tRecord successfully added into Student table...!");
50                  out.print("<p>" + "Record with student no " +myStudent.getStuno()
51                          + " successfully created..!" + "</p>");
52                  out.print("<p>" + "Details of record are; " + "</p>");
53                  out.print("<p>Student ID : " + myStudent.getStuno() + "</p>");
54                  out.print("<p>Name : " + myStudent.getName() + "</p>");
55                  out.print("<p>Program : " + myStudent.getProgram() + "</p>");
56              }
57              //Step5: close database connection..!
58                  System.out.println("Step 5: Close database connection..!");
59                  myConnection.close();
60                  System.out.println(" ");
61                  System.out.println("Database connection is closed..!");
62          %>
63      </body>
64  </html>
```

errorStudent.jsp

```jsp
7    <%@page contentType="text/html" pageEncoding="UTF-8"%>
8    <!DOCTYPE html>
9    <html>
10       <head>
11           <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
12           <title>JSP Page</title>
13       </head>
14       <body>
15           <form id="errorFrm" action="insertStudent.jsp" method="post">
16               <h1>Lab 6 - Task 1 - Perform creating and retrieving records via JSP page</h1>
17               <p>Error occur when inserting record...!</p>
18               <p>Error Message: ${exception.getMessage()}</p>
19               <br>
20           </form>
21       </body>
22   </html>
```

The output.

┌─ Student Registration ─────────────────────────────┐
│   │
│ Student No   UK96584   │
│ Name   Laila a/p Din   │
│ Program   BSc. in Robotics   ▾   │
│   Submit   Cancel   │
│   │
└───┘

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Record successfully added into Student table...!

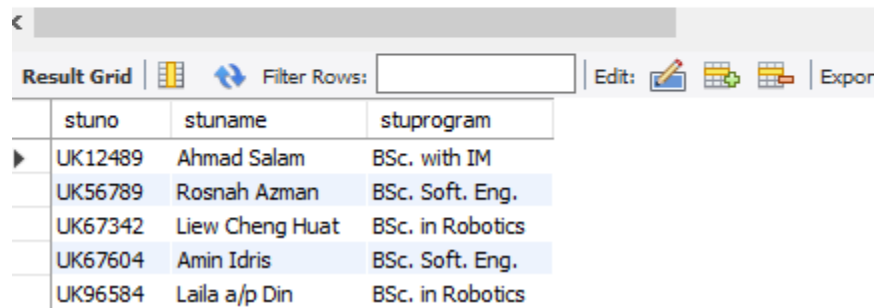Record with student no UK96584 successfully created..!

Details of record are;

Student ID : UK96584

Name : Laila a/p Din

Program : BSc. in Robotics

The database

```
1 •   SELECT * FROM csm3023_lab6.student;
```

Result Grid | Filter Rows: | Edit: | Expor

stuno	stuname	stuprogram
UK12489	Ahmad Salam	BSc. with IM
UK56789	Rosnah Azman	BSc. Soft. Eng.
UK67342	Liew Cheng Huat	BSc. in Robotics
UK67604	Amin Idris	BSc. Soft. Eng.
UK96584	Laila a/p Din	BSc. in Robotics

Reflection

1. What you have learnt from this exercise?

- From this exercise, I learnt how to used JSP Standard Action, scriptlets and regular expression to insert records and retrieve them from MySQL database.

2. Define step by step before you successfully perform the transaction in a database.
- Load JDBC driver
- Establish the connection
- Create a PreparedStatement object
- Execute the query
- Close database connection.

TASK 4 : PERFORM RETRIEVING RECORDS VIA JSP PAGE

Objective :

- Use Java Scriptlet to query a list of records

queryStudent.jsp

```
7    <%@page contentType="text/html" pageEncoding="UTF-8"%>
8    <%@page import="java.sql.*"%>
9    <!DOCTYPE html>
10   <html>
11       <head>
12           <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
13           <title>JSP Page</title>
14       </head>
15       <style>
16           table {
17               border-collapse: collapse;
18           }
19           td, th {
20               border: 1px solid #999;
21               padding: 0.5rem;
22               text-align: left;
23           }
24           th{
25               background: gold;
26           }
27       </style>
28       <body>
29           <h1>Task 4: Retrieving record via JSP page</h1>
30
31           <%
32           out.print("<table>");
33               out.print("<thead>");
34                   out.print("<tr>");
35                       out.print("<th>" + "ISBNNo" + "</th>");
36                       out.print("<th>" + "Author" + "</th>");
37                       out.print("<th>" + "Title" + "</th>");
38                   out.print("</tr>");
```

```
39                   out.print("</thead>");
40                   out.print("<tbody>");
41           %>
42           <%
43               //Step 1: Load JDBC driver..
44               Class.forName("com.mysql.cj.jdbc.Driver");
45               System.out.println("Step 1: MySQL driver loaded...!");
46
47               //Step 2: Establish the connection
48               String myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
49               Connection myConnection = DriverManager.getConnection(myURL, "root", "admin");
50               System.out.println("Step 2: Database is connected...!");
51
52               //Step 3: Create a PreparedStatement object...
53               Statement myStatement = myConnection.createStatement();
54
55               String myQuery = "SELECT * FROM student";
56               ResultSet myResultSet = myStatement.executeQuery(myQuery);
57
58               while(myResultSet.next()){
59                   out.print("<tr>");
60                       out.print("<td width=\"20%\">" +  myResultSet.getString(1) + "</td>");
61                       out.print("<td width=\"40%\">" +  myResultSet.getString(2) + "</td>");
62                       out.print("<td width=\"40%\">" +  myResultSet.getString(3) + "</td>");
63                   out.print("</tr>");
64               }
65               //Step5: close database connection..!
66                   System.out.println("Step 5: Close database connection..!");
67                   myConnection.close();
68                   System.out.println(" ");
69                   System.out.println("Database connection is closed..!");
```

```
70
71            out.print("</tbody>");
72        out.print("</table>");
73      %>
74    </body>
   </html>
```

The output.

Task 4: Retrieving record via JSP page

ISBNNo	Author	Title
UK12489	Ahmad Salam	BSc. with IM
UK56789	Rosnah Azman	BSc. Soft. Eng.
UK67342	Liew Cheng Huat	BSc. in Robotics
UK67604	Amin Idris	BSc. Soft. Eng.
UK96584	Laila a/p Din	BSc. in Robotics

Reflection

1. What you have learnt from this exercise?

   From this exercise, I learnt how to used Java Scriptlet to query a lists of records.

2. Explain the differences when using Statement() and PreparedStatement().

☐ Statement:

- Easier to write simple queries.
- Less secure (prone to SQL injection attacks).
- may directly build the SQL string with variable values.

☐ PreparedStatement:

- More secure (protects against SQL injection).
- Separates the SQL query from the data (variables).
- can set values using separate methods for each data type (e.g., setString, setInt).

TASK 5: CREATE A RECORD USING JSP MODEL1

Objective :

- Use JavaBeans to perform SQL transaction

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>JSP Page</title>
    </head>
    <body>
        <h1>Superhero Marathon 2025</h1>
        <fieldset>
            <legend>Marathon Registration</legend>
            <form action="processMarathon.jsp" method="post">
                <table>
                    <tr>
                        <td>
                            <label for="icno">IC No</label>
                        </td>
                        <td>
                            <input type="text" id="icno" name="icno" placeholder="E.g.: 921110-10-2514">
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <label for="name">Name</label>
                        </td>
                        <td>
                            <input type="text" id="name" name="name" placeholder="Enter your name">
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <label for="category">Category</label>
                        </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>
                            <button type="submit" value="Submit">Submit</button>
                            <button type="reset" value="Reset">Cancel</button>
                        </td>
                    </tr>
                </table>
            </form>
        </fieldset>
        <footer>
            <p>&copy;Superhero Marathon Asia 2025</p>
        </footer>
    </body>
</html>
```

Marathon.java

```java
10    public class Marathon {
11        private String icno;
12        private String name;
13        private String category;
14
15        public String getIcno() {
16            return icno;
17        }
18
19        public void setIcno(String icno) {
20            this.icno = icno;
21        }
22
23        public String getName() {
24            return name;
25        }
26
27        public void setName(String name) {
28            this.name = name;
29        }
30
31        public String getCategory() {
32            return category;
33        }
34
35        public void setCategory(String category) {
36            this.category = category;
37        }
38
39    }
```

MarathonDAO.java

```java
7     import java.sql.Connection;
8     import java.sql.PreparedStatement;
9     import java.sql.SQLException;
      import lab6.com.Database;
11
12    /**
13     *
14     * @author User
15     */
16    public class MarathonDAO {
      private Connection connection;
18        private int result = 0;
19        public MarathonDAO() throws ClassNotFoundException{
20            connection = Database.getConnection();
21        }
22        public int addDetails(Marathon marathon){
23            try{
24                String mySQL = "INSERT INTO marathon(icno, name, category) VALUES (?, ?, ?)";
25                PreparedStatement preparedStatement = connection.prepareStatement(mySQL);
26
27                System.out.println("IC no   = " + marathon.getIcno());
28                System.out.println("Name    = " + marathon.getName());
29                System.out.println("Category= " + marathon.getCategory());
30
31                //Parameters
32                preparedStatement.setString(1, marathon.getIcno());
33                preparedStatement.setString(2, marathon.getName());
34                preparedStatement.setString(3, marathon.getCategory());
35                result = preparedStatement.executeUpdate();
36            }catch(SQLException e){
                  e.printStackTrace();
38            }
39            return result;
40        }
41    }
```

processMarathon.jsp

```jsp
7    <%@page contentType="text/html" pageEncoding="UTF-8"%>
8    <%@page language="java"%>
9    <%@page import="java.sql.*"%>
10   <%@page import="lab6.com.Database"%>
11   <%@page import="lab6.com.Marathon"%>
12   <%@page import="lab6.com.MarathonDAO"%>
13   <!DOCTYPE html>
14   <html>
15       <head>
16           <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
17           <title>JSP Page</title>
18       </head>
19       <body>
20           <jsp:useBean id="myMarathon" class="lab6.com.Marathon" scope="request"/>
21           <jsp:setProperty name="myMarathon" property="*"/>
22
23           <%
24               int result;
25               //Step 1: create Database object...
26               Database myDB = new Database();
27
28               MarathonDAO object1 = new MarathonDAO();
29
30               //Step 2: Add the records...
31               result = object1.addDetails(myMarathon);
32
33               //Step 3: Determine whether the transactions is success..
34               if(result > 0){
35                   System.out.println("\tRecord successfully added into Book's table...!");
36                   out.print("<p>" + "Record with IC No " + myMarathon.getIcno() +
37                           " successfully created..!" + "</p>");
38                   out.print("<p>" + "Details of record are: " + "</p>");

39                   out.print("<p>Ic NO    : " + myMarathon.getIcno() + "</p>");
40                   out.print("<p>Name    : " + myMarathon.getName() + "</p>");
41                   out.print("<p>Category    : " + myMarathon.getCategory() + "</p>");
42               }else{
43                   out.print("<p>Crazyy this is an error! maybe you already registerd before?</p>");
44               }
45
46               //Step 4: Close database connection..!
47               System.out.println("Step 5: Close database connection...!");
48               myDB.closeConnection();
49               System.out.println(" ");
50               System.out.println("Database connection is closed...!");
51           %>
52       </body>
53   </html>
```

Database.java

```java
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;
import java.util.logging.Level;
import java.util.logging.Logger;
/**
 *
 * @author User
 */
public class Database {
        private static Connection myConnection = null;
    private static String myURL = myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
    private int result = 0;

    public static Connection getConnection() throws ClassNotFoundException{
        if(myConnection != null){
            return myConnection;
        }
        else try{
            Class.forName("com.mysql.cj.jdbc.Driver");
            myConnection = DriverManager.getConnection(myURL, "root", "admin");
        }
        catch(SQLException e){
            e.printStackTrace();
        }
        return myConnection;
    }

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

}
```

The output.

Superhero Marathon 2025

Marathon Registration

IC No	631490-10-5986
Name	Fatimah Rabiah
Category	5 KM

Submit   Cancel

©Superhero Marathon Asia 2025

Record with IC No 631490-10-5986 successfully created..!

Details of record are:
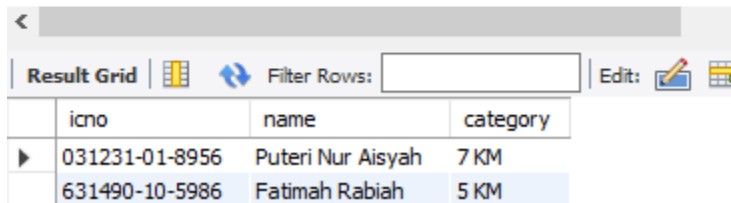
Ic NO : 631490-10-5986

Name : Fatimah Rabiah

Category : 5 KM

The database

```sql
1 •   SELECT * FROM csm3023_lab6.marathon;
```

<

Result Grid	Filter Rows:		Edit:
icno	name	category
031231-01-8956	Puteri Nur Aisyah	7 KM
631490-10-5986	Fatimah Rabiah	5 KM

Reflection

1. What you have learnt from this exercise?

   From this task, I learnt how to use JavaBeans to perform SQL transaction using PreparedStatement()

2. Describe the benefits of using JavaBeans

- JavaBeans allow components to be reused in different parts of program.

EXERCISE

Implement user login

a. Create a table known as userprofile using database schema CF3107 using these attributes.
   i. username as a character length 15 and must be primary key
   ii. password as a character length 10
   iii. firstname as varchar(50)
   iv. lastname as varchar(50)
b. Create insertUser.html as the main interface to register a new user.
c. Create processUser.jsp page to process the record.
d. Create login.jsp page to login to the system.
e. Create doLogin.jsp to validate username and password. If validation is successful, redirect the page to main.jsp page that displays the username, firstname and lastname.
f. If validation is unsuccessful, redirect the page to login.jsp with message 'Invalid username or password..!'

insertUser.html

```html
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>JSP Page</title>
    </head>
    <body>
        <h1>Department of Quality UMT</h1>
        <fieldset>
            <legend>User Registration</legend>
            <form action="processUser.jsp">
                <table>
                    <tr>
                        <td>
                            <label for="username">Username</label>
                        </td>
                        <td>
                            <input type="text" id="username" name="username" placeholder="Enter a username">
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <label for="password">Password</label>
                        </td>
                        <td>
                            <input type="password" id="password" name="password" placeholder="Enter a password">
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <label for="firstname">Firstname</label>
                        </td>
                        <td>
                            <input type="text" id="firstname" name="firstname" placeholder="E.g.:Ecah">
                        </td>
                    </tr>
```

```
42              <tr>
43                  <td>
44                      <label for="lastname">Lastname</label>
45                  </td>
46                  <td>
47                      <input type="text" id="lastname" name="lastname" placeholder="E.g.:bin Daud">
48                  </td>
49              </tr>
50              <tr>
51                  <td>
52                      <button type="submit" value="Submit">Submit</button>
53                      <button type="reset" value="Reset">Cancel</button>
55                  </td>
56              </tr>
57          </table>
58      </form>
59      </fieldset>
60      <footer>
61          <p>&copy;Quality UMT - 2024</p>
62      </body>
    </html>
```

processUser.jsp

```
7   <%@page contentType="text/html" pageEncoding="UTF-8"%>
8   <%@page language="java"%>
9   <%@page import="java.sql.*"%>
10  <%@page errorPage="login.jsp"%>
11  <!DOCTYPE html>
12  <html>
13      <head>
14          <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
15          <title>Department of Quality UMT</title>
16      </head>
17      <body>
18          <jsp:useBean id="myUser" class="lab6.com.User" scope="request"/>
19          <jsp:setProperty name="myUser" property="*"/>
20
21          <%
22              int result;
23
24              //Step 1: Load JDBC driver..
25              Class.forName("com.mysql.cj.jdbc.Driver");
26              System.out.println("Step 1: MySQL driver loaded...!");
27
28              //Step 2: Establish the connection
29              String myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
30              Connection myConnection = DriverManager.getConnection(myURL, "root", "admin");
31              System.out.println("Step 2: Database is connected...!");
32
33              //Step 3: Create a PreparedStatement object...
34              System.out.println("Step3: Prepared Statements created...!");
35              String sInsertQry = "INSERT INTO userprofile(username, password, firstname, lastname) VALUES(?, ?, ?, ?)";
36              System.out.println("\tSQL Query: " + sInsertQry);
37
38              //Call method preparedStatement
39              PreparedStatement myPS = myConnection.prepareStatement(sInsertQry);
```

```
41            //Assign each value to respective columns for Student's table.. (C-Create)
42            myPS.setString(1, myUser.getUsername());
43            myPS.setString(2, myUser.getPassword());
44            myPS.setString(3, myUser.getFirstname());
45            myPS.setString(4, myUser.getLastname());
46
47            result = myPS.executeUpdate();
48            if (result > 0){
49                out.println("\tRecord successfully added into User table...!");
50                out.print("<p>" + "Record with Username " +myUser.getUsername()
51                        + " successfully created..!" + "</p>");
52                out.print("<p>" + "Details of record are; " + "</p>");
53                out.print("<p>Username : " + myUser.getUsername() + "</p>");
54                out.print("<p>Firstname : " + myUser.getFirstname() + "</p>");
55                out.print("<p>Lastname : " + myUser.getLastname() + "</p>");
56            }
57            //Step5: close database connection..!
58                System.out.println("Step 5: Close database connection..!");
59                myConnection.close();
60                System.out.println(" ");
61                System.out.println("Database connection is closed..!");
62        %>
63    </body>
  </html>
```

Login.jsp

```
7    <%@page contentType="text/html" pageEncoding="UTF-8"%>
8    <!DOCTYPE html>
9    <html>
10       <head>
11           <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
12           <title>JSP Page</title>
13       </head>
14       <body>
15           <h1>Department of Quality UMT</h1>
16           <fieldset>
17               <legend>User Login</legend>
18               <form action="doLogin.jsp">
19                   <table>
20                       <tr>
21                           <td>
22                               <label for="username">Username</label>
23                           </td>
24                           <td>
25                               <input type="text" id="username" name="username" placeholder="Enter a username">
26                           </td>
27                       </tr>
28                       <tr>
29                           <td>
30                               <label for="password">Password</label>
31                           </td>
32                           <td>
33                               <input type="password" id="password" name="password" placeholder="Enter a password">
34                           </td>
35                       </tr>
36                       <tr>
37                           <td>
38                               <button type="submit" value="Submit">Submit</button>
39                               <button type="reset" value="Reset">Cancel</button>
40                           </td>
41                       </tr>
42                   </table>
43               </form>
44           </fieldset>
45           <%
46               String errorMessage = request.getParameter("error");
47               if (errorMessage != null && !errorMessage.isEmpty()) {
48                   out.println("<p style='color: red'>" + errorMessage + "</p>");
49               }
50           %>
51           <footer>
52               <p>&copy;Quality UMT - 2024</p>
53           </footer>
54       </body>
  </html>
```

Dologin.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@ page import="java.sql.*, lab6.com.User" %>
<%@ page import="java.io.*, java.util.*" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Department of Quality UMT</title>
    </head>
    <body>
        <h1>Department of Quality UMT</h1>
        <%
            // Retrieve username and password from the request
            String username = request.getParameter("username");
            String password = request.getParameter("password");

            // Check if username and password are not null and not empty
            if (username != null && !username.isEmpty() && password != null && !password.isEmpty()) {
                // Establish database connection
                Connection conn = null;
                PreparedStatement pstmt = null;
                ResultSet rs = null;
                try {
                    Class.forName("com.mysql.cj.jdbc.Driver");
                    String myURL = "jdbc:mysql://localhost:3306/csm3023_lab6";
                    conn = DriverManager.getConnection(myURL, "root", "admin");

                    // Query to check if the username and password are valid
                    String query = "SELECT * FROM userprofile WHERE username = ? AND password = ?";
                    pstmt = conn.prepareStatement(query);
                    pstmt.setString(1, username);
                    pstmt.setString(2, password);
                    rs = pstmt.executeQuery();

                    if (rs.next()) {
                        // If user exists and credentials are valid, redirect to main.jsp
                        User user = new User();
                        user.setUsername(rs.getString("username"));
                        user.setFirstname(rs.getString("firstname"));
                        user.setLastname(rs.getString("lastname"));

                        // Set user object in session for later use
                        session.setAttribute("user", user);
                        response.sendRedirect("main.jsp");
                    } else {
                        // If invalid username or password, redirect back to login.jsp with error message
                        response.sendRedirect("login.jsp?error=Invalid+username+or+password");
                    }
                } catch (Exception e) {
                    e.printStackTrace();
                } finally {
                    // Close resources
                    if (rs != null) rs.close();
                    if (pstmt != null) pstmt.close();
                    if (conn != null) conn.close();
                }
            } else {
                // If username or password is empty, redirect back to login.jsp with error message
                response.sendRedirect("login.jsp?error=Username+and+password+are+required");
            }
        %>
    </body>
</html>
```

User.java

```java
public class User {
    private String username;
    private String password;
    private String firstname;
    private String 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;
    }
}
```

The output

Department of Quality UMT

┌─ User Registration ──────────────────────────────────┐
│   │
│ Username   [Kzaman   ]   │
│ Password   [••••••   ]   │
│ Firstname   [Khairul   ]   │
│ Lastname   [Azman   ]   │
│   │
│   [Submit] [Cancel]   │
│   │
└───┘

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Record successfully added into User table...!

Record with Username Kzaman successfully created..!

Details of record are;

Username : Kzaman

Firstname : Khairul

Lastname : Azman

The database

```
1 •    SELECT * FROM csm3023_lab6.userprofile;
```

Result Grid | Filter Rows: [   ] | Edit:

username	password	firstname	lastname
arinn0205	arinn0205	Nur	Arina
Kzaman	Kzaman	Khairul	Azman