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**CSM3023 WEB BASED APPLICATION DEVELOPMENT (K1)**

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**BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH  
HONORS**

**SEMESTER 2 2023/2024**

**LAB 7 – JSP: Perform Create, Update, Retrieve and Delete (CRUD)**

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## Task 1:

### Coding:

#### User.java

```
11 public class User {
12     private String userid;
13     private String firstName;
14     private String lastName;
15
16     public String getUserId() {
17         return userid;
18     }
19
20     public void setUserid(String userid) {
21         this.userid = userid;
22     }
23
24     public String getFirstName() {
25         return firstName;
26     }
27
28     public void setFirstName(String firstName) {
29         this.firstName = firstName;
30     }
31
32     public String getLastName() {
33         return lastName;
34     }
35
36     public void setLastName(String lastName) {
37         this.lastName = lastName;
38     }
39 }
```

#### DBConnection.java

```
12 import java.sql.*;
13 public class DBConnection {
14     private static Connection myConnection = null;
15     private static String myURL = "jdbc:mysql://localhost:3306/csm3023_lab7?";
16
17     public DBConnection() {
18     }
19
20     public static Connection getConnection() throws ClassNotFoundException {
21         if(myConnection != null){
22             return myConnection;
23         }
24         try{
25             //Establish and open MySQL database connection...
26             Class.forName("com.mysql.cj.jdbc.Driver");
27             myConnection = DriverManager.getConnection(myURL, "root", "admin");
28         }catch(SQLException e){
29             e.printStackTrace();
30         }
31         return myConnection;
32     }
33
34     public void closeConnection() throws ClassNotFoundException {
35         try{
36             myConnection.close();
37         }catch(SQLException e){
38             e.printStackTrace();
39         }
40     }
41 }
```

#### UserDao.java

```

package com.dao;

/**
 *
 * @author Leonardo
 */
import java.sql.*;
import java.util.*;
import com.model.User;
import com.util.DBConnection;

public class UserDao {
    private Connection connection;

    public UserDao() throws ClassNotFoundException {
        connection = DBConnection.getConnection();
    }

    public void addUser(User user) {
        try {
            PreparedStatement preparedStatement = connection
                .prepareStatement("insert into users(userid, firstname, lastname) values (?, ?, ?)");

            //Parameters start with 1
            preparedStatement.setString(1, user.getUserid());
            preparedStatement.setString(2, user.getFirstName());
            preparedStatement.setString(3, user.getLastName());
            preparedStatement.executeUpdate();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public void deleteUser(String userid) {
        try {
            PreparedStatement preparedStatement = connection
                .prepareStatement("delete from users where userid=?");
            // Parameters start with 1
            preparedStatement.setString(1, userid);
            preparedStatement.executeUpdate();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public void deleteUser(String userId) {
        try {
            PreparedStatement preparedStatement = connection
                .prepareStatement("delete from users where userid=?");
            // Parameters start with 1
            preparedStatement.setString(1, userId);
            preparedStatement.executeUpdate();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public void updateUser(User user) {
        try {
            PreparedStatement preparedStatement = connection
                .prepareStatement("update users set firstname=?, lastname=? " +
                    "where userid=?");
            // Parameters start with 1
            preparedStatement.setString(1, user.getFirstName());
            preparedStatement.setString(2, user.getLastName());
            preparedStatement.setString(3, user.getUserid());
            preparedStatement.executeUpdate();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public List<User> getAllUsers() {
        List<User> users = new ArrayList<User>();
        try {
            Statement statement = connection.createStatement();
            ResultSet rs = statement.executeQuery("select * from users");
            while (rs.next()) {
                User user = new User();
                user.setUserid(rs.getString("userid"));
                user.setFirstName(rs.getString("firstname"));
                user.setLastName(rs.getString("lastname"));
                users.add(user);
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return users;
    }

    public User getUserById(String userid) {
        User user = new User();
        try {
            PreparedStatement preparedStatement = connection
                .prepareStatement("select * from users where userid=?");
            preparedStatement.setString(1, userid);
            ResultSet rs = preparedStatement.executeQuery();

            while (rs.next()) {
                user.setUserid(rs.getString("userid"));
                user.setFirstName(rs.getString("firstname"));
                user.setLastName(rs.getString("lastname"));
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }
        return user;
    }
}

```

## UserController.java

```
public class UserController extends HttpServlet {

    private static String INSERT = "/user.jsp";
    private static String EDIT = "/editUser.jsp";
    private static String LIST_USER = "/listUser.jsp";
    private UserDao dao;

    public UserController() throws ClassNotFoundException {
        super();
        dao = new UserDao();
    }

    @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        String forward = "";
        String action = request.getParameter("action");

        if (action.equalsIgnoreCase("delete")) {
            String userId = request.getParameter("userId");
            dao.deleteUser(userId);
            forward = LIST_USER;
            request.setAttribute("users", dao.getAllUsers());
        }
        else if (action.equalsIgnoreCase("edit")) {
            forward = EDIT;
            String userId = request.getParameter("userId");
            User user = dao.getUserById(userId);
            request.setAttribute("user", user);
        }
        else if (action.equalsIgnoreCase("listUser")) {
            forward = LIST_USER;
            request.setAttribute("users", dao.getAllUsers());
        }
        else if (action.equalsIgnoreCase("insert")) {
            forward = INSERT;
        }

        RequestDispatcher view = request.getRequestDispatcher(forward);
        view.forward(request, response);
    }

    /**
     * Handles the HTTP <code>POST</code> method.
     *
     * @param request HttpServletRequest request
     * @param response HttpServletResponse response
     * @throws ServletException if a Servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        String action = request.getParameter("action");

        User user = new User();
        user.setUserId(request.getParameter("userid"));
        user.setFirstName(request.getParameter("firstName"));
        user.setLastName(request.getParameter("lastName"));

        if (action.equalsIgnoreCase("edit")) {
            dao.updateUser(user);
        }
        else {
            dao.addUser(user);
        }

        RequestDispatcher view = request.getRequestDispatcher(LIST_USER);
        request.setAttribute("users", dao.getAllUsers());
        view.forward(request, response);
    }

    /**
     * Returns a short description of the Servlet.
     *
     * @return a String containing Servlet description
     */
    @Override
    public String getServletInfo() {
        return "Short description";
    }
}
```

## index.jsp

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Sample Perform CRUD Using Java Servlet</title>
    </head>
    <body>
        <h1>Sample Perform CRUD Using Java Servlet!</h1>
        <jsp:forward page="/UserController?action=listUser" />
    </body>
</html>
```

## listUser.jsp

```
1 <%page contentType="text/html" pageEncoding="UTF-8"%>
2 <%taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
3 <%taglib uri="http://java.sun.com/jsp/jstl/fmt" prefix="fmt"%>
4 <!DOCTYPE html>
5 <html>
6 <head>
7 <meta http-equiv="Content-Type" content="text/html; charset=UTF-8"%>
8 <title>User List</title>
9 </head>
10 <body>
11 <h1>User Lists</h1>
12 <table border="1">
13 <thead>
14 <tr>
15 <th>User Id</th>
16 <th>First Name</th>
17 <th>Last Name</th>
18 <th colspan="2">Action</th>
19 </tr>
20 </thead>
21 <tbody>
22 <c:forEach items="${users}" var="user">
23 <tr>
24 <td><c:out value="${user.userId}" /></td>
25 <td><c:out value="${user.firstName}" /></td>
26 <td><c:out value="${user.lastName}" /></td>
27 <td><a href="UserController?action=edituserId<c:out value="${user.userId}" />">Update</a></td>
28 <td><a href="UserController?action=deleteuserId<c:out value="${user.userId}" />">Delete</a></td>
29 </tr>
30 </c:forEach>
31 </tbody>
32 </table>
33 <p><a href="UserController?action=insert">Add User</a></p>
34 </body>
35 </html>
```

## user.jsp

```
1 <%page contentType="text/html" pageEncoding="UTF-8"%>
2 <!DOCTYPE html>
3 <html>
4 <head>
5 <meta http-equiv="Content-Type" content="text/html; charset=UTF-8"%>
6 <title>New Record</title>
7 </head>
8 <body>
9 <hr/>
10 <p><b>New Record</b></p>
11 <form name="frmAddUser" action="UserController" method="POST">
12 <table border="0">
13 <tbody>
14 <tr>
15 <td>User ID :</td>
16 <td><input type="text" name="userid" value="" size="25" required /></td>
17 </tr>
18 <tr>
19 <td>First Name :</td>
20 <td><input type="text" name="firstName" value="" size="40" /></td>
21 </tr>
22 <tr>
23 <td>Last Name :</td>
24 <td><input type="text" name="lastName" value="" size="40" /></td>
25 </tr>
26 <tr>
27 <td colspan="2"><input type="hidden" name="action" value="insert" /></td>
28 </tr>
29 <tr>
30 <td colspan="2">
31 <input type="submit" value="Submit" name="submit" />
32 <input type="reset" value="Cancel" name="cancel" />
33 </td>
34 </tr>
35 </tbody>
36 </table>
37 </form>
38 </body>
39 </html>
```

## editUser.jsp

```
<%page contentType="text/html" pageEncoding="UTF-8"%>
<%taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c"%>
<%taglib uri="http://java.sun.com/jsp/jstl/rt" prefix="fmt"%>
<!DOCTYPE html>
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
<title>Edit User</title>
</head>
<body>
<p>Updating User Profile</p>
<form name="frmEditUser" action="UserController" method="POST">
<table border="0">
<tbody>
<tr>
<td>User ID :</td>
<td><input type="text" name="userid" readonly="readonly" value="${user.userid}" /> size="25" /></td>
</tr>
<tr>
<td>First Name :</td>
<td><input type="text" name="firstName" value="${user.firstName}" /> size="40" /></td>
</tr>
<tr>
<td>Last Name :</td>
<td><input type="text" name="lastName" value="${user.lastName}" /> size="40" /></td>
</tr>
<tr>
<td>
<input type="hidden" name="action" value="edit" />
</td>
</tr>
<tr>
<td>
<input type="submit" value="Submit" name="submit" />
</td>
</tr>
</tbody>
</table>
</form>
</body>
</html>
```

Output:

### New Record

User ID :	<input type="text" value="1005"/>
First Name :	<input type="text" value="Imran"/>
Last Name :	<input type="text" value="Al Franco"/>
<input type="button" value="Submit"/> <input type="button" value="Cancel"/>	

# User Lists

User Id	First Name	Last Name	Action	
1001	Aisyrul	Amri	<a href="#">Update</a>	<a href="#">Delete</a>
1002	Boxue	Chiang	<a href="#">Update</a>	<a href="#">Delete</a>
1003	Jennifer	Lawrence	<a href="#">Update</a>	<a href="#">Delete</a>
1004	Alexander	Bohemian	<a href="#">Update</a>	<a href="#">Delete</a>
1005	Imran	Al Franco	<a href="#">Update</a>	<a href="#">Delete</a>

[Add User](#)

### Updating User Profile

User ID :

First Name :

Last Name :

## User Lists

User Id	First Name	Last Name	Action	
1001	Aisyrul	Amri	<a href="#">Update</a>	<a href="#">Delete</a>
1002	Boxue	Chiang	<a href="#">Update</a>	<a href="#">Delete</a>
1003	Jennifer	Lawrence	<a href="#">Update</a>	<a href="#">Delete</a>
1004	Alexander	Bohemian	<a href="#">Update</a>	<a href="#">Delete</a>
1005	Imran	Al Attas	<a href="#">Update</a>	<a href="#">Delete</a>

[Add User](#)

## User Lists

User Id	First Name	Last Name	Action	
1001	Aisyrul	Amri	<a href="#">Update</a>	<a href="#">Delete</a>
1002	Boxue	Chiang	<a href="#">Update</a>	<a href="#">Delete</a>
1003	Jennifer	Lawrence	<a href="#">Update</a>	<a href="#">Delete</a>
1004	Alexander	Bohemian	<a href="#">Update</a>	<a href="#">Delete</a>

[Add User](#)

## Exercise

### Q1:profile.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 SYSTEM</title>
</head>
<body>
<br/>
<p><b>New Record</b></p>
<form name="frmAddProfile" action="profileServlet" method="POST">
<table border="0">
<tbody>
<tr>
<td>Username :</td>
<td><input type="text" id="username" name="username" maxlength="15" required /></td>
</tr>
<tr>
<td>IC Number :</td>
<td><input type="text" id="icno" name="icno" maxlength="15" /></td>
</tr>
<tr>
<td>First Name :</td>
<td><input type="text" id="firstname" name="firstname" maxlength="50" /></td>
</tr>
<tr>
<td>
<input type="submit" value="Register" name="submit" />
<input type="reset" value="Cancel" name="cancel" />
</td>
</tr>
</tbody>
</table>
</form>
</body>
</html>
```

### profileServlet.java

```
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;

/**
 *
 * @author Lenovo
 */
public class profileServlet extends HttpServlet {

    /**
     * Processes requests for both HTTP GET and POST
     * methods.
     *
     * @param request HttpServletRequest request
     * @param response HttpServletResponse response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html; charset=UTF-8");

        PrintWriter out = response.getWriter();
        Connection conn = null;
        PreparedStatement stmt = null;

        try {
            // Get form data
            String username = request.getParameter("username");
            String icno = request.getParameter("icno");
            String firstname = request.getParameter("firstname");

            // Load the JDBC driver
            Class.forName("com.mysql.cj.jdbc.Driver");

            // Establish a connection
            conn = DriverManager.getConnection("jdbc:mysql://localhost:3306/conn021_lab", "root", "admin");

            // Prepare the SQL statement
            String sql = "INSERT INTO usersprofile (username, icno, firstname) VALUES (?, ?, ?)";
            stmt = conn.prepareStatement(sql);
            stmt.setString(1, username);
            stmt.setString(2, icno);
            stmt.setString(3, firstname);

            // Execute the statement
            int rows = stmt.executeUpdate();

            if (rows > 0) {
                out.println("<div>Profile registered successfully</div>");
            } else {
                out.println("<div>Profile registration failed</div>");
            }

        } catch (SQLException | ClassNotFoundException e) {
            out.println("<div>Error: " + e.getMessage() + "</div>");
            e.printStackTrace();
        } finally {
            try {
                if (stmt != null) stmt.close();
                if (conn != null) conn.close();
            } catch (SQLException e) {
                e.printStackTrace();
            }
        }

        out.close();
    }

    // editor-fold defaultstate="collapsed" desc="HttpServlet methods. Click on the + sign on the left to edit the code."
    /**
     * Handles the HTTP GET method.
     */
}
```



Output:

### New Record

Username :	<input type="text" value="feedByte"/>
IC Number :	<input type="text" value="921102-11-9973"/>
First Name :	<input type="text" value="Firdaus Zayani"/>
<input type="button" value="Register"/> <input type="button" value="Cancel"/>	

---

**Profile registered successfully!**

	username	icno	firstname
▶	feedByte	921102-11-9973	Firdaus Zayani
	muke//99	030113-12-0864	Mukmin Akid
	ziqmunk	031121-01-0865	Haziq
	ziqmunk34	031121-01-0864	Haziq Kamil
•	NULL	NULL	NULL

Q2:

```

<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<%@ page session="true" %>
<!DOCTYPE html>
<html>
<head>
    <meta charset="UTF-8">
    <title>Student Registration</title>
</head>
<body>
    <h1>Student Registration</h1>
    <form action="confirmRegister.jsp" method="post">
        <label for="studentid">Student ID:</label>
        <input type="text" id="studentid" name="studentid" required><br><br>
        <label for="name">Name:</label>
        <input type="text" id="name" name="name" required><br><br>
        <input type="submit" value="Submit">
    </form>
</body>
</html>

```

```

<%@ page language="java" contentType="text/html; charset=UTF-8" pageEncoding="UTF-8"%>
<%@ page session="true" %>
<!DOCTYPE html>
<html>
<head>
    <meta charset="UTF-8">
    <title>Confirm Registration</title>
</head>
<body>
    <h1>Confirm Registration</h1>
    <%
        String studentId = request.getParameter("studentid");
        String name = request.getParameter("name");

        // Store the student details in session
        session.setAttribute("studentid", studentId);
        session.setAttribute("name", name);
    %>
    <p>Student ID: <%= studentId %></p>
    <p>Name: <%= name %></p>
    <form action="notificationRegister.jsp" method="post">
        <input type="submit" value="Proceed">
    </form>
</body>
</html>

```

Output:

# Student Registration

Student ID:

Name:

# Confirm Registration

Student ID: S63874

Name: Ackermann

# Registration Notification

Registration successful for Student ID: S63874 and Name: Ackermann