CSM3023 WEB BASED APPLICATION DEVELOPMENT (K1)

BACHELOR OF COMPUTER SCIENCE (MOBILE COMPUTING) WITH HONORS

SEMESTER 2 2023/2024

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

Prepared by:

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Task 1:
Coding:
User.java

```java
package com.model;

/**
 *
 * @author Lenovo
 */
public class User {
    private String userid;
    private String firstName;
    private String lastName;

    public String getUserid() {
        return userid;
    }

    public void setUserid(String userid) {
        this.userid = userid;
    }

    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;
    }
```

DBConnection.java

```java
package com.util;

/**
 *
 * @author Lenovo
 */
import java.io.*;
import java.sql.*;
public class DBConnection {
    private static Connection myConnection = null;
    private static String myURL = "jdbc:mysql://localhost:3306/csm3023_lab7";

    DBConnection(){

    }

    public static Connection getConnection() throws ClassNotFoundException{
        if(myConnection != null){
            return myConnection;
        }else{
            try{
                //Establish and open MySQL database connection...
                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();
        }
    }
}
```

UserDao.java

```java
package com.dao;

/**
 *
 * @author Lenovo
 */
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();
            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

```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 servlet request
     * @param response servlet 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";
    }// </editor-fold>
}
```

index.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>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

```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/fmt" prefix="fmt"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>User List</title>
    </head>
    <body>
        <h1>User Lists</h1>
        <table border="1">
            <thead>
                <tr>
                    <th>User Id</th>
                    <th>First Name</th>
                    <th>Last Name</th>
                    <th colspan="2">Action</th>
                </tr>
            </thead>
            <tbody>
                <c:forEach items="${users}" var="user">
                    <tr>
                    <td><c:out value="${user.userid}" /></td>
                    <td><c:out value="${user.firstName}" /></td>
                    <td><c:out value="${user.lastName}" /></td>
                    <td><a href="UserController?action=edit&userId=<c:out value="${user.userid}"/>">Update</a></td>
                    <td><a href="UserController?action=delete&userId=<c:out value="${user.userid}"/>">Delete</a></td>
                    </tr>
                </c:forEach>
            </tbody>
        </table>
        <p><a href="UserController?action=insert">Add User</a></p>
    </body>
</html>
```

user.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>New Record</title>
    </head>
    <body>
        <br/>
        <p><b>New Record</b></p>
        <form name="frmAddUser" action="UserController" method="POST">
            <table border="0">
                <tbody>
                    <tr>
                        <td>User ID :</td>
                        <td><input type="text" name="userid" value="" size="25" required /></td>
                    </tr>
                    <tr>
                        <td>First Name :</td>
                        <td><input type="text" name="firstName" value="" size="40" /></td>
                    </tr>
                    <tr>
                        <td>Last Name :</td>
                        <td><input type="text" name="lastName" value="" size="40" /></td>
                    </tr>
                    <tr>
                        <td><input type="hidden" name="action" value="insert" /></td>
                    </tr>
                    <tr>
                        <td>
                            <input type="submit" value="Submit" name="submit" />
                            <input type="reset" value="Cancel" name="cancel" />
                        </td>
                    </tr>
                </tbody>
            </table>
        </form>
    </body>
</html>
```

editUser.jsp

```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/fmt" prefix="fmt"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Eidt 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="<c:out value="${user.userid}" />" size="25" /></td>
                    </tr>
                    <tr>
                        <td>First Name :</td>
                        <td><input type="text" name="firstName" value="<c:out value="${user.firstName}" />" size="40" /></td>
                    </tr>
                    <tr>
                        <td>Last Name :</td>
                        <td><input type="text" name="lastName" value="<c:out 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 :	1005
First Name :	Imran
Last Name :	Al Franco

Submit   Cancel

User Lists

User Id	First Name	Last Name	Action	
1001	Aisyrul	Amri	Update	Delete
1002	Boxue	Chiang	Update	Delete
1003	Jennifer	Lawrence	Update	Delete
1004	Alexander	Bohemian	Update	Delete
1005	Imran	Al Franco	Update	Delete

Add User

Updating User Profile

User ID : `1005`

First Name : `Imran`

Last Name : `Al Attas`

Submit

User Lists

User Id	First Name	Last Name	Action	
1001	Aisyrul	Amri	Update	Delete
1002	Boxue	Chiang	Update	Delete
1003	Jennifer	Lawrence	Update	Delete
1004	Alexander	Bohemian	Update	Delete
1005	Imran	Al Attas	Update	Delete

Add User

User Lists

User Id	First Name	Last Name	Action	
1001	Aisyrul	Amri	Update	Delete
1002	Boxue	Chiang	Update	Delete
1003	Jennifer	Lawrence	Update	Delete
1004	Alexander	Bohemian	Update	Delete

Add User

Exercise

Q1:profile.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>UMT APDT 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="firtname" 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

```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.annotation.WebServlet;
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 <code>GET</code> and <code>POST</code>
     * methods.
     *
     * @param request servlet request
     * @param response servlet 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/csm2023_lab7", "root", "admin");

            // Prepare the SQL statement
            String sql = "INSERT INTO userprofile (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("<h1>Profile registered successfully!</h1>");
            } else {
                out.println("<h1>Profile registration failed.</h1>");
            }
        } catch (SQLException | ClassNotFoundException e) {
            out.println("<h1>Error: " + e.getMessage() + "</h1>");
            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 <code>GET</code> method.
```

Output:

New Record

Username :	feedByte
IC Number :	921102-11-9973
First Name :	Firdaus Zayani

Register 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:

```jsp
<%@ 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>
```

```jsp
<%@ 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: S63874

Name: Ackermann

Submit

Confirm Registration

Student ID: S63874

Name: Ackermann

Proceed

Registration Notification

Registration successful for Student ID: S63874 and Name: Ackermann

Github link:

https://github.com/ziqmunk/CSM3023/tree/dc28f69e1ac9b42c7561dddf6426f5b1c66b7ff1/S67978_Lab7/CRUDServlet