Week 7

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

Web Programming 2

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Semester: 4

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Lecturers

Task 1: Perform Basic CRUD Process Using Java Servlet

Code:

//User.java


```java
/**
 *
 * @author ASUS
 */
package com.model;
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 void setLastName(String parameter) {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/GeneratedMetho
    }

    public void setUserId(String parameter) {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/GeneratedMetho
    }

    public String getUserId() {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/GeneratedMetho
    }

    public String getLastName() {
        throw new UnsupportedOperationException("Not supported yet."); // Generated from nbfs://nbhost/SystemFileSystem/Templates/Classes/Code/GeneratedMetho
    }
}
```

//UserDAO.java


```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package com.dao;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.sql.Statement;
import java.util.ArrayList;
import java.util.List;

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 (?,?,?)");

            preparedStatement.setString(1, user.getUserId());
            preparedStatement.setString(2, user.getFirstName());
            preparedStatement.setString(3, user.getLastName());
            preparedStatement.execute();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}
```

```java
        }
    }

    public void deleteUser(String userId) {
        try {
            PreparedStatement preparedStatement = [         ].prepareStatement("delete from users where userid=?");

            preparedStatement.setString(1, userId);
            preparedStatement.execute();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public void updateUser(User user) {
        try {
            PreparedStatement preparedStatement = [         ].prepareStatement("update users set firstname = ?, lastname= ? where userid = ?");
            preparedStatement.setString(1, user.getFirstName());
            preparedStatement.setString(2, user.getLastName());
            preparedStatement.setString(3, user.getUserId());

            preparedStatement.execute();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public List<User> getAllUsers() {
        List<User> users = new ArrayList<>();
        try {
            Statement statement = [         ].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 = [         ].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
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/JSP_Servlet/Servlet.java to edit this template
 */
package com.controller;

import java.io.IOException;
import com.model.User;
import com.dao.UserDAO;
import jakarta.servlet.RequestDispatcher;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;


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();
    }

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

        if (action.equalsIgnoreCase("delete")) {
            String userId = request.getParameter("userId");
            dao.deleteUser(userId);
            foward = LIST_USER;
```

```java
            foward = LIST_USER;
            request.setAttribute("users", dao.getAllUsers());
        } else if (action.equalsIgnoreCase("edit")) {
            foward = EDIT;
            String userId = request.getParameter("userId");
            User user = dao.getUserbyId(userId);
            request.setAttribute("user", user);
        } else if (action.equalsIgnoreCase("listUser")) {
            foward = LIST_USER;
            request.setAttribute("users", dao.getAllUsers());
        } else if (action.equalsIgnoreCase("insert")) {
            foward = INSERT;
        }

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

    }

    @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);

    }

}
```

//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 CUD Using Jsva Servlet</h1>
        <jsp:forward page="/UserController?action=listUser" />
    </body>
</html>
```

//user.jsp

```jsp
<%--
    Document   : user
    Created on : 6 Jun 2024, 10:42:20 am
    Author     : Yong
--%>

<%@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" required /></td>
                    </tr>
                    <tr>
                        <td>Last Name: </td>
                        <td><input type="text" name="lastName" value="" size="40" required /></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>
```

//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 Lists</title>
    </head>
    <body>
        <p>List of Users...!</p>
        <table>
            <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>
```

//editUser.jsp

```jsp
<%--
    Document   : editUser
    Created on : 6 Jun 2024, 10:50:03 am
    Author     : Yong
--%>

<%@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>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="<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" value="edit" name="action" />
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <input type="submit" value="Submit" name="submit" />
                        </td>
                    </tr>
                </tbody>
            </table>
        </form>
    </body>
</html>
```

Outputs:

List of Users...!

User Id	First Name	Last Name	Action
1	Ching	XJ	Update Delete

Add User

//Create UI

New Record

User ID:	2
First Name:	Song
Last Name:	KX

Submit Cancel

//Post Create

List of Users...!

User Id	First Name	Last Name	Action
1	Ching	XJ	Update Delete
2	Song	KX	Update Delete

Add User

//Update UI

Updating User Profile

User ID:	1
First Name:	Ching
Last Name:	Xiang Jie

Submit

//Post Update

List of Users...!

User Id	First Name	Last Name	Action
1	Ching	Xiang Jie	Update Delete
2	Song	KX	Update Delete

Add User

//Post Delete

List of Users...!

User Id	First Name	Last Name	Action
1	Ching	Xiang Jie	Update Delete

Add User

Reflections:

Why we use servlet for Java Web Application?

```
-to perform business logic
```

Exercise

Code:

//Profile.java

```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package com.model;

public class Profile {
    private String username;
    private String icno;
    private String firstName;

    /**...3 lines */
    public String getUsername() {...3 lines }

    /**...3 lines */
    public void setUsername(String username) {...3 lines }

    /**...3 lines */
    public String getIcno() {...3 lines }

    /**...3 lines */
    public void setIcno(String icno) {...3 lines }

    /**...3 lines */
    public String getFirstName() {...3 lines }

    /**...3 lines */
    public void setFirstName(String firstName) {...3 lines }
}
```

//ProfileDAO.java

```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/Classes/Class.java to edit this template
 */
package com.dao;

import com.model.Profile;
import com.util.DBConnection;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;

public class ProfileDAO {

    private Connection connection;

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

    public void addProfile(Profile profile) {
        try {
            PreparedStatement preparedStatement = connection.prepareStatement("insert into userprofile(username, icno, firstname) values (?,?,?)");

            preparedStatement.setString(1, profile.getUsername());
            preparedStatement.setString(2, profile.getIcno());
            preparedStatement.setString(3, profile.getFirstName());
            preparedStatement.execute();
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }

    public Profile getProfilebyUsername(String username) {
        Profile profile = new Profile();
        try {
            PreparedStatement preparedStatement = connection.prepareStatement("select * from userprofile where username = ?");
            preparedStatement.setString(1, username);

            ResultSet rs = preparedStatement.executeQuery();

            while (rs.next()) {
                profile.setUsername(rs.getString("username"));
                profile.setIcno(rs.getString("icno"));
                profile.setFirstName(rs.getString("firstname"));
            }
        } catch (SQLException e) {
            e.printStackTrace();
        }

        return profile;
    }
}
```

//ProfileServlet.java

```java
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/JSP_Servlet/Servlet.java to edit this template
 */
package com.controller;

import com.dao.ProfileDAO;
import com.model.Profile;
import jakarta.servlet.RequestDispatcher;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.io.IOException;

/**
 *
 * @author Profile
 */
public class ProfileServlet extends HttpServlet {

    private static String INSERT = "/studentRegister.jsp";
    private static String CONFIRM = "/confirmRegister.jsp";
    private static String CREATED = "/notificationRegister.jsp";
    private ProfileDAO dao;

    public ProfileServlet() throws ClassNotFoundException {
        super();
        dao = new ProfileDAO();
    }

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

        if (action.equalsIgnoreCase("confirm")) {
            foward = CONFIRM;
            String username = request.getParameter("username");
            Profile profile = dao.getProfilebyUsername(username);
            request.setAttribute("profile", profile);
        } else if (action.equalsIgnoreCase("insert")) {
            foward = INSERT;
        } else if (action.equalsIgnoreCase("created")) {
            foward = CREATED;
        }

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

    }

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

        Profile profile = new Profile();
        profile.setUsername(request.getParameter("username"));
        profile.setIcno(request.getParameter("icno"));
        profile.setFirstName(request.getParameter("firstName"));

        if (action.equalsIgnoreCase("insert")) {
            request.setAttribute("profile", profile); // Set the profile attribute here
            RequestDispatcher view = request.getRequestDispatcher(CONFIRM);
            view.forward(request, response);
        } else if (action.equalsIgnoreCase("confirm")) {
            dao.addProfile(profile);
            RequestDispatcher view = request.getRequestDispatcher(CREATED);
            view.forward(request, response);
        }
    }
}
```

//studentRegister.jsp

```jsp
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib uri="http://java.sun.com/jsp/jstl/core" prefix="c" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
        <title>Student Register</title>
    </head>
    <body>
        <br />
        <p><b>Student Register</b></p>
        <form name="frmAddUser" action="ProfileServlet" method="POST">
            <table border="0">
                <tbody>
                    <tr>
                        <td>Username: </td>
                        <td><input type="text" name="username" value="" size="25" required /></td>
                    </tr>
                    <tr>
                        <td>IC No: </td>
                        <td><input type="text" name="icno" value="" size="40" required /></td>
                    </tr>
                    <tr>
                        <td>First Name: </td>
                        <td><input type="text" name="firstName" value="" size="40" required /></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"/>
```

//confirmRegistration.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>Confirm Register</title>
    </head>
    <body>
        <p>Confirm Register</p>
        <form name="frmEditUser" action="ProfileServlet" method="POST">
            <table border="0">
                <tbody>
                    <tr>
                        <td>User ID:</td>
                        <td><input type="text" name="profileId" readonly="readonly" value="<c:out value="${profile.username}" />" size="25" /></t
                    </tr>
                    <tr>
                        <td>First Name:</td>
                        <td><input type="text" name="firstName" value="<c:out value="${profile.icno}" />" size="40" /></td>
                    </tr>
                    <tr>
                        <td>Last Name:</td>
                        <td><input type="text" name="lastName" value="<c:out value="${profile.firstName}" />" size="40" /></td>
                    </tr>
                    <tr>
                        <td>
                            <input type="hidden" value="confirm" name="action" />
                        </td>
                    </tr>
                    <tr>
                        <td>
                            <input type="submit" value="Submit" name="submit" />
                        </td>
                    </tr>
                </tbody>
            </table>
        </form>
    </body>
</html>
```

//notificationRegister.jsp

```jsp
<%@ taglib prefix="c" uri="http://java.sun.com/jsp/jstl/core" %>
<%@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>Student <c:out value="${user.username}" /> created...!</h1>
    </body>
</html>
```

Outputs:

Student Register

Username: [azlan]
IC No: [222222-22-2222]
First Name: [di]
[Submit] [Cancel]

Confirm Register

User ID: [azlan]
First Name: [222222-22-2222]
Last Name: [di]
[Submit]

Student created...!