Universiti Malaysia Terengganu

Faculty of Computer Sciences and Mathematics

Web Based Application Development
CSM3023

Lab Report 7

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Task 1: Perform Basic CRUD Process Using Java Servlet

- Objective: Using Java Servlet to perform creating, retrieving, updating and deleting (CRUD) records from MySQL database.

- Code:

  - users table

```
CREATE TABLE `users` (
  `userID` varchar(15) NOT NULL,
  `firstname` varchar(35) DEFAULT NULL,
  `lastname` varchar(35) DEFAULT NULL,
  PRIMARY KEY (`userID`)
)
```

  - User.java

```java
package lab7.model;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class User {

    private String userID, firstname, 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;
    }
```

```
}
```

o DBConnection.java

```java
package lab7.dao;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class DBConnection {

    private static Connection connection = null;
    private static String url =
"jdbc:mysql://localhost:3306/csm3023lab7";
    private static String username = "root";
    private static String password = "admin";

    public static Connection getConnection() throws
ClassNotFoundException {

        if (connection != null)
            return connection;

        else {
            try {
                // Establish and open MySQL database connection
                Class.forName("com.mysql.cj.jdbc.Driver");
                connection = DriverManager.getConnection(url,
username, password);
            }
            catch (SQLException e) {
                e.printStackTrace();
            }
        }

        return connection;

    }

    public void closeConnection() throws ClassNotFoundException
{

        try {
            connection.close();
        }
        catch (SQLException e) {
            e.printStackTrace();
        }

    }
```

```
}
```

o UserDAO.java

```java
package lab7.dao;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.util.ArrayList;
import java.util.List;
import lab7.model.User;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class UserDAO {

    private Connection connection;

    private static final String INSERT_USER = "INSERT INTO users
VALUES (?, ?, ?)";
    private static final String DELETE_USER = "DELETE FROM users
WHERE userID = ?";
    private static final String UPDATE_USER = "UPDATE users SET
firstname = ?, lastname = ? WHERE userID = ?";
    private static final String SELECT_ALL_USERS = "SELECT *
FROM users";
    private static final String SELECT_USER_BY_ID = "SELECT *
FROM users WHERE userID = ?";

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

    public void addUser(User user) {

        try {
            PreparedStatement preparedStatement =
connection.prepareStatement(INSERT_USER);

            // 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();
        }

    }
```

```java
    public void deleteUser(String userID) {

        try {
            PreparedStatement preparedStatement =
connection.prepareStatement(DELETE_USER);

            preparedStatement.setString(1, userID);

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

    }

    public void updateUser(User user) {

        try {
            PreparedStatement preparedStatement =
connection.prepareStatement(UPDATE_USER);

            // 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<>();

        try {
            PreparedStatement preparedStatement =
connection.prepareStatement(SELECT_ALL_USERS);

            ResultSet resultSet =
preparedStatement.executeQuery();

            while ( resultSet.next() ) {
                User user = new User();
                user.setUserID(resultSet.getString("userID"));

user.setFirstname(resultSet.getString("firstname"));

user.setLastname(resultSet.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_USER_BY_ID);

                    preparedStatement.setString(1, userID);

                    ResultSet resultSet =
preparedStatement.executeQuery();

                    while ( resultSet.next() ) {
                        user.setUserID(resultSet.getString("userID"));

user.setFirstname(resultSet.getString("firstname"));

user.setLastname(resultSet.getString("lastname"));
                    }
            }
            catch (SQLException e) {
                    e.printStackTrace();
            }

            return user;

    }

}
```

o UserServlet.java

```
package lab7.controller;

import jakarta.servlet.RequestDispatcher;
import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import lab7.model.User;
import lab7.dao.UserDAO;

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

```java
public class UserServlet extends HttpServlet {

    private static String INSERT = "/user.jsp";
    private static String EDIT = "/editUser.jsp";
    private static String LIST_USER = "/listUser.jsp";
    private UserDAO userDAO;

    public UserServlet() throws ClassNotFoundException {
        super();
        userDAO = new UserDAO();
    }


    /**
     * 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");
        try (PrintWriter out = response.getWriter()) {
            /* TODO output your page here. You may use following
sample code. */
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet UserServlet</title>");
            out.println("</head>");
            out.println("<body>");
            out.println("<h1>Servlet UserServlet at " +
request.getContextPath() + "</h1>");
            out.println("</body>");
            out.println("</html>");
        }
    }

    // <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.
     *
     * @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 doGet(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
```

```java
        String forward = "";
        String action = request.getParameter("action");

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

        RequestDispatcher requestDispatcher =
request.getRequestDispatcher(forward);
        requestDispatcher.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") ) {
            userDAO.updateUser(user);
        }
        else {
            userDAO.addUser(user);
        }
```

```
        RequestDispatcher requestDispatcher =
request.getRequestDispatcher(LIST_USER);
        request.setAttribute("users", userDAO.getAllUsers());
        requestDispatcher.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

```
<%--
    Document    : index
    Created on : 29 May 2024, 3:37:39 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

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

- listUser.jsp

```
<%--
    Document    : listUser
    Created on : 29 May 2024, 3:42:26 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib prefix="c" uri="jakarta.tags.core" %>
<%@taglib prefix="fmt" uri="jakarta.tags.fmt" %>
```

```html
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>User List</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
        <script src="https://kit.fontawesome.com/aa5de83a5b.js"
crossorigin="anonymous"></script>
    </head>
    <body>
        <div class="container mt-3">
            <table class="table">
                <thead class="table-dark text-center">
                    <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 class="text-center"><a
href="UserServlet?action=edit&userID=<c:out
value="${user.userID}" />"><i class="fa-solid fa-
pen"></i></a></td>
                            <td class="text-center"><a
href="UserServlet?action=delete&userID=<c:out
value="${user.userID}" />"><i class="fa-solid fa-
trash"></i></a></td>
                        </tr>
                    </c:forEach>
                        <tr>
                            <td colspan="5" class="text-
center"><a href="UserServlet?action=insert"><i class="fa-solid
fa-plus"></i></a></td>
                        </tr>
                </tbody>
            </table>
        </div>
    </body>
</html>
```

- user.jsp

```jsp
<%--
    Document    : user
    Created on  : 29 May 2024, 4:07:55 pm
    Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib prefix="c" uri="jakarta.tags.core" %>
<%@taglib prefix="fmt" uri="jakarta.tags.fmt" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>New Record</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
    </head>
    <body>
        <div class="container mt-3">
            <h2>New Record</h2>

            <form name="formAddUser" action="UserServlet"
method="post" class="mt-3">
                <div class="form-group">
                    <label for="userID">User ID:</label>
                    <input type="text" class="form-control"
name="userID" id="userID" size="25" required>
                </div>
                <div class="form-group">
                    <label for="firstname">First Name:</label>
                    <input type="text" class="form-control"
name="firstname" id="firstname" size="40">
                </div>
                <div class="form-group">
                    <label for="lastname">Last Name:</label>
                    <input type="text" class="form-control"
name="lastname" id="lastname" size="40">
                </div>
                <div class="form-group">
                    <input type="hidden" name="action"
value="insert">
                </div>
                <div class="d-flex justify-content-end">
                    <button type="reset"
class="btn">Clear</button>
                    <button type="submit" class="btn btn-
dark">Submit</button>
                </div>
            </form>
        </div>
    </body>
</html>
```

- editUser.jsp

```jsp
<%--
    Document   : editUser
    Created on : 30 May 2024, 2:39:48 am
    Author     : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib prefix="c" uri="jakarta.tags.core" %>
<%@taglib prefix="fmt" uri="jakarta.tags.fmt" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>Edit User</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
    </head>
    <body>
        <div class="container mt-3">
            <h2>Updating User Profile</h2>

            <form name="formEditUser" action="UserServlet"
method="post" class="mt-3">
                <div class="form-group">
                    <label for="userID">User ID:</label>
                    <input type="text" class="form-control"
name="userID" id="userID" size="25" value="<c:out
value="${user.userID}" />" readonly>
                </div>
                <div class="form-group">
                    <label for="firstname">First Name:</label>
                    <input type="text" class="form-control"
name="firstname" id="firstname" size="40" value="<c:out
value="${user.firstname}" />">
                </div>
                <div class="form-group">
                    <label for="lastname">Last Name:</label>
                    <input type="text" class="form-control"
name="lastname" id="lastname" size="40" value="<c:out
value="${user.lastname}" />">
                </div>
                <div class="form-group">
                    <input type="hidden" name="action"
value="edit">
                </div>
                <div class="d-flex justify-content-end">
                    <button type="submit" class="btn btn-
dark">Submit</button>
                </div>
```
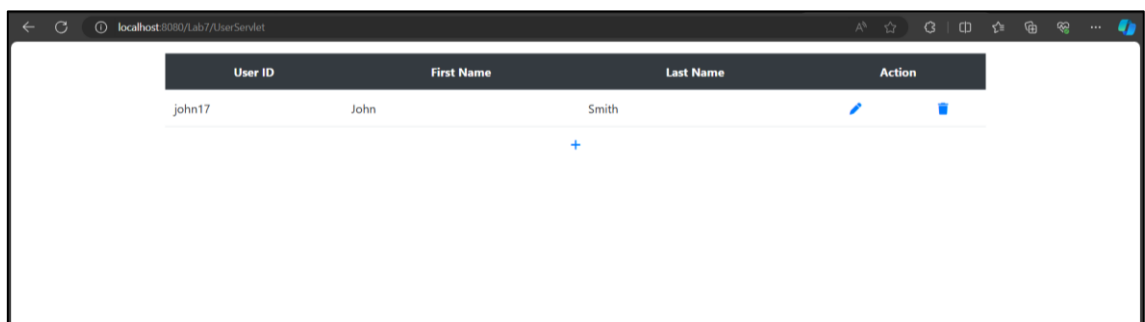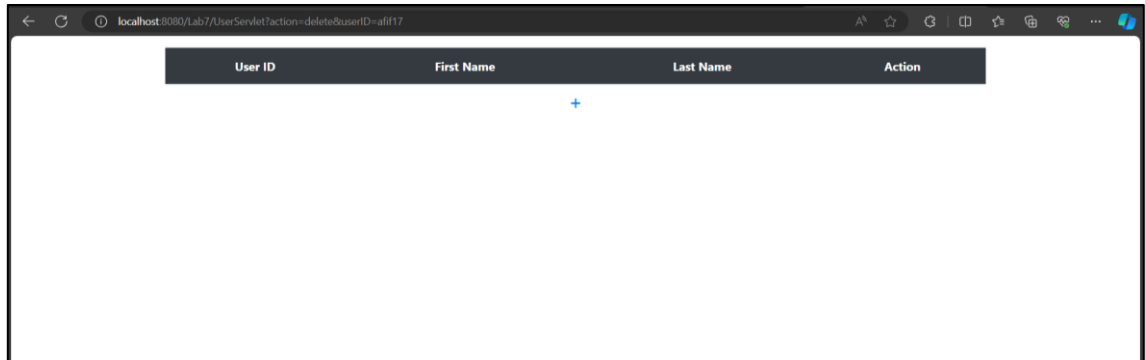
```
                </form>
            </div>
        </body>
</html>
```

- Output:

- Reflection:

    o Why we use servlet for Java Web Application?

      Servlets are a very useful technology for the development of dynamic Java-based web applications because they share specifications with web servers, but execute Java code. These process and control HTTP transactions, thus you are capable of processing the inputs from users, querying databases, creating more content and rendering consummate web interactions. This makes servlets as very crucial tool in establishing web-based applications that are strong and can allow for more than the basic html web page.

Exercise 1

- Objective: Implement profile registration using servlet.

- Code:

  - userprofile table

  ```
  CREATE TABLE `userprofile` (
    `username` varchar(15) NOT NULL,
    `icno` varchar(15) DEFAULT NULL,
    `firstname` varchar(50) DEFAULT NULL,
    PRIMARY KEY (`username`)
  )
  ```

  - Profile.java

  ```java
  package lab7.model;

  import java.util.Objects;

  /**
   *
   * @author Ahmad Afif Syahmi bin Ahmad Rozali
   */
  public class Profile {

      private String username, icno, firstname;

      public String getUsername() {
          return username;
      }

      public void setUsername(String username) {
          this.username = username;
      }

      public String getIcno() {
          return icno;
      }

      public void setIcno(String icno) {
          this.icno = icno;
      }

      public String getFirstname() {
          return firstname;
      }

      public void setFirstname(String firstname) {
          this.firstname = firstname;
      }
  ```

```
    @Override
    public boolean equals(Object obj) {
        if (this == obj) {
            return true;
        }
        if (obj == null) {
            return false;
        }
        if (getClass() != obj.getClass()) {
            return false;
        }
        final Profile other = (Profile) obj;
        if (!Objects.equals(this.username, other.username)) {
            return false;
        }
        if (!Objects.equals(this.icno, other.icno)) {
            return false;
        }
        return Objects.equals(this.firstname, other.firstname);
    }

}
```

o   ProfileDAO.java

```
package lab7.dao;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.util.ArrayList;
import java.util.List;
import lab7.model.Profile;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class ProfileDAO {

    private Connection connection;

    private static final String INSERT_PROFILE = "INSERT INTO
userprofile VALUES (?, ?, ?)";
    private static final String SELECT_PROFILE_BY_USERNAME =
"SELECT * FROM userprofile WHERE username = ?";

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

    public void addProfile(Profile profile) {

        try {
```

```
            PreparedStatement preparedStatement =
connection.prepareStatement(INSERT_PROFILE);

            preparedStatement.setString(1,
profile.getUsername());
            preparedStatement.setString(2, profile.getIcno());
            preparedStatement.setString(3,
profile.getFirstname());

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

    }

    public Profile getProfileByUsername(String username) {

        Profile profile = new Profile();

        try{
            PreparedStatement preparedStatement =
connection.prepareStatement(SELECT_PROFILE_BY_USERNAME);

            preparedStatement.setString(1, username);

            ResultSet resultSet =
preparedStatement.executeQuery();

            while ( resultSet.next() ) {

profile.setUsername(resultSet.getString("username"));
                profile.setIcno(resultSet.getString("icno"));

profile.setFirstname(resultSet.getString("firstname"));
            }
        }
        catch (SQLException e) {
            e.printStackTrace();
        }

        return profile;

    }

}
```

o   ProfileServlet.java

```
package lab7.controller;

import jakarta.servlet.RequestDispatcher;
import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
```

```java
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.util.logging.Level;
import java.util.logging.Logger;
import lab7.dao.ProfileDAO;
import lab7.model.Profile;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
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,
ClassNotFoundException {

        PrintWriter out = response.getWriter();

        ProfileDAO profileDAO = new ProfileDAO();

        Profile profile = new Profile();

        String username = request.getParameter("username");
        String icno = request.getParameter("icno");
        String firstname = request.getParameter("firstname");

        profile.setUsername(username);
        profile.setIcno(icno);
        profile.setFirstname(firstname);

        if (
!profile.equals(profileDAO.getProfileByUsername(username)) ) {

            profileDAO.addProfile(profile);

            RequestDispatcher requestDispatcher =
request.getRequestDispatcher("/processProfile.jsp");
            request.setAttribute("profile", profile);
            requestDispatcher.forward(request, response);
        }
        else {
            out.println("<script>");
            out.println("alert('Profile with username \\'" +
username + "\\' already exists.');");
```

```java
            out.println("window.location.href =
'registerProfile.html';");
            out.println("</script>");
        }

    }

    // <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.
     *
     * @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 doGet(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {
        try {
            processRequest(request, response);
        } catch (ClassNotFoundException ex) {

Logger.getLogger(ProfileServlet.class.getName()).log(Level.SEVER
E, null, ex);
        }
    }

    /**
     * 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 {
        try {
            processRequest(request, response);
        } catch (ClassNotFoundException ex) {

Logger.getLogger(ProfileServlet.class.getName()).log(Level.SEVER
E, null, ex);
        }
    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
```

```
    public String getServletInfo() {
        return "Short description";
    }// </editor-fold>

}
```

o   registerProfile.html

```html
<!DOCTYPE html>
<html>
    <head>
        <title>User Profile Registration</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width,
initial-scale=1.0">
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
    </head>
    <body>

        <div class="container mt-3">
            <h2>User Profile Registration</h2>

            <form action="ProfileServlet" class="mt-3">
                <div class="form-group">
                    <label for="username">Username</label>
                    <input type="text" id="username"
name="username" class="form-control" maxlength="15" required>
                </div>
                <div class="form-group">
                    <label for="icno">IC No</label>
                    <input type="text" id="icno" name="icno"
class="form-control" maxlength="15" required>
                </div>
                <div class="form-group">
                    <label for="firstname">First Name</label>
                    <input type="text" id="firstname"
name="firstname" class="form-control" maxlength="50">
                </div>
                <div class="d-flex justify-content-end">
                    <button type="reset"
class="btn">Clear</button>
                    <button type="submit" class="btn btn-
dark">Submit</button>
                </div>
            </form>
        </div>

        <script
src="https://cdn.jsdelivr.net/npm/jquery@3.5.1/dist/jquery.slim.
min.js" integrity="sha384-
DfXdz2htPH0lsSSs5nCTpuj/zy4C+OGpamoFVy38MVBnE+IbbVYUew+OrCXaRkfj
" crossorigin="anonymous"></script>
```

```
    <script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/js/bootst
rap.bundle.min.js" integrity="sha384-
Fy6S3B9q64WdZWQUiU+q4/2Lc9npb8tCaSX9FK7E8HnRr0Jz8D60P9dO5Vg3Q9ct
" crossorigin="anonymous"></script>

    </body>
</html>
```

- processProfile.jsp

```
<%--
    Document   : processProfile
    Created on : 30 May 2024, 7:18:02 pm
    Author     : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib prefix="c" uri="jakarta.tags.core" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>User Profile Details</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
    </head>
    <body>

        <div class="container mt-3">
            <p>User profile with username <c:out
value="${profile.username}" /> has been registered
successfully!</p>

            <p>User profile details are:</p>

            <table>
                <tr>
                    <td>Username:</td>
                    <td class="pl-3"><c:out
value="${profile.username}" /></td>
                </tr>
                <tr>
                    <td>IC No:</td>
                    <td class="pl-3"><c:out
value="${profile.icno}" /></td>
                </tr>
                <tr>
                    <td>First Name:</td>
                    <td class="pl-3"><c:out
value="${profile.firstname}" /></td>
                </tr>
```

```
            </table>
        </div>

        <script
src="https://cdn.jsdelivr.net/npm/jquery@3.5.1/dist/jquery.slim.
min.js" integrity="sha384-
DfXdz2htPH0lsSSs5nCTpuj/zy4C+OGpamoFVy38MVBnE+IbbVYUew+OrCXaRkfj
" crossorigin="anonymous"></script>
        <script
src="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/js/bootst
rap.bundle.min.js" integrity="sha384-
Fy6S3B9q64WdZWQUiU+q4/2Lc9npb8tCaSX9FK7E8HnRr0Jz8D60P9dO5Vg3Q9ct
" crossorigin="anonymous"></script>

    </body>
</html>
```

- Output:

Exercise 2

- Objective: Applying session in student registration.

- Code:

  - student table

```
CREATE TABLE `student` (
   `studID` varchar(6) NOT NULL,
   `studName` varchar(50) DEFAULT NULL,
   PRIMARY KEY (`studID`)
)
```

  - Student.java

```java
package lab7.model;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class Student {

    private String studID, studName;

    public String getStudID() {
        return studID;
    }

    public void setStudID(String studID) {
        this.studID = studID;
    }

    public String getStudName() {
        return studName;
    }

    public void setStudName(String studName) {
        this.studName = studName;
    }

}
```

  - StudentDAO.java

```java
package lab7.dao;

import java.sql.Connection;
```

```java
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import lab7.model.Student;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class StudentDAO {

    private String jdbcurl =
"jdbc:mysql://localhost:3306/csm3023lab7";
    private String username = "root";
    private String password = "admin";

    private static final String INSERT_STUDENT = "INSERT INTO
student VALUES (?, ?)";
    private static final String SELECT_STUDENT_BY_ID = "SELECT *
FROM student WHERE studID = ?";

    protected Connection getConnection() {

        Connection connection = null;

        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
            connection = DriverManager.getConnection(jdbcurl,
username, password);
        }
        catch (SQLException e) {
            e.printStackTrace();
        }
        catch (ClassNotFoundException e) {
            e.printStackTrace();
        }

        return connection;

    }

    public boolean insertStudent(Student student) throws
SQLException {

        boolean isSuccess = false;

        try {
            Connection connection = getConnection();

            PreparedStatement preparedStatement =
connection.prepareStatement(INSERT_STUDENT);
            preparedStatement.setString(1, student.getStudID());
            preparedStatement.setString(2,
student.getStudName());

            isSuccess = preparedStatement.executeUpdate() > 0;

            connection.close();
```

```java
        }
        catch (Exception e) {
            e.printStackTrace();
        }

        return isSuccess;

    }

    public Student selectStudentByID(int studID) {

        Student student = null;

        try {
            Connection connection = getConnection();
            PreparedStatement preparedStatement =
connection.prepareStatement(SELECT_STUDENT_BY_ID);

            preparedStatement.setInt(1, studID);

            ResultSet rs = preparedStatement.executeQuery();

            if (rs.next()) {
                student.setStudID(rs.getString("studID"));
                student.setStudName(rs.getString("studName"));
            }

            connection.close();
        }
        catch (SQLException e) {
            e.printStackTrace();
        }

        return student;

    }

}
```

o   StudentServlet.java

```java
package lab7.controller;

import jakarta.servlet.RequestDispatcher;
import jakarta.servlet.ServletContext;
import java.io.IOException;
import java.io.PrintWriter;
import jakarta.servlet.ServletException;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import jakarta.servlet.http.HttpSession;
import java.sql.SQLException;
import java.util.logging.Level;
import java.util.logging.Logger;
import lab7.dao.StudentDAO;
```

```java
import lab7.model.Student;

/**
 *
 * @author Ahmad Afif Syahmi bin Ahmad Rozali
 */
public class StudentServlet 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
     */

    private StudentDAO studentDAO;

    @Override
    public void init() {
        studentDAO = new StudentDAO();
    }

    // <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.
     *
     * @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 doGet(HttpServletRequest request,
HttpServletResponse response)
            throws ServletException, IOException {

        String studID = request.getParameter("studID");
        String studName = request.getParameter("studName");

        // Create session or retrieve existing one
        HttpSession session = request.getSession();

        // Store student information in session
        session.setAttribute("studID", studID);
        session.setAttribute("studName", studName);

        // Redirect to confirmation page
        response.sendRedirect("confirmRegister.jsp");

    }

    /**
```

```
     * 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 {

        try {
            String studID = request.getParameter("studID");
            String studName = request.getParameter("studName");

            Student student = new Student();
            student.setStudID(studID);
            student.setStudName(studName);

            boolean addSuccess =
studentDAO.insertStudent(student);

            HttpSession session = request.getSession();
            session.setAttribute("addSuccess", addSuccess);

            ServletContext sc = getServletContext();
            RequestDispatcher dispatcher =
sc.getRequestDispatcher("/notificationRegister.jsp");
            dispatcher.forward(request, response);
        }
        catch (SQLException ex) {
            ex.printStackTrace();
        }

    }

    /**
     * Returns a short description of the servlet.
     *
     * @return a String containing servlet description
     */
    @Override
    public String getServletInfo() {
        return "Short description";
    }// </editor-fold>

}
```

o studentRegister.jsp

```
<%--
    Document   : studentRegister
    Created on : 31 May 2024, 5:13:52 am
    Author     : Ahmad Afif Syahmi bin Ahmad Rozali
```

```
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>Student Registration</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
    </head>
    <body>

        <div class="container mt-3">
            <h2>Student Registration</h2>

            <form action="StudentServlet" class="mt-3"
method="get">
                <div class="form-group">
                    <label for="studID">Student ID<span
class="text-danger">*</span></label>
                    <input type="text" id="studID" name="studID"
class="form-control" placeholder="E.g. S12345" maxlength="6"
pattern="^S[0-9]{5}$" required>
                </div>
                <div class="form-group">
                    <label for="studName">Name</label>
                    <input type="text" id="studName"
name="studName" class="form-control" maxlength="50"
placeholder="Enter name">
                </div>
                <div class="d-flex justify-content-end">
                    <button type="reset"
class="btn">Clear</button>
                    <button type="submit" class="btn btn-
dark">Submit</button>
                </div>
            </form>
        </div>

    </body>
</html>
```

o confirmRegister.jsp

```
<%--
    Document   : confirmRegister
    Created on : 31 May 2024, 5:49:17 am
    Author     : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

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

```
<%@taglib prefix="c" uri="jakarta.tags.core" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>Confirm Student Registration</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
        <script src="https://code.jquery.com/jquery-
3.7.1.slim.min.js" integrity="sha256-
kmHvs0B+OpCW5GVHUNjv9rOmY0IvSIRcf7zGUDTDQM8="
crossorigin="anonymous"></script>
    </head>
    <body>
        <div class="container mt-3">
            <h2>Student Registration Confirmation</h2>

            <p>You want to register the following student:</p>
            <ul>
                <li>Student ID: <c:out value="${studID}" /></li>
                <li>Name: <c:out value="${studName}" /></li>
            </ul>

            <div class="d-flex justify-content-end">
                <form action="notificationRegister.jsp"
method="post">
                    <input type="hidden" value="${studID}"
name="studID">
                    <input type="hidden" value="${studName}"
name="studName">
                    <button type="button" class="btn"
id="btnCancel">Cancel</button>
                    <button type="submit" class="btn btn-
dark">Proceed</button>
                </form>
            </div>
        </div>

        <script>
            $("#btnCancel").click(() => {
                window.location = "studentRegister.jsp"
            });
        </script>
    </body>
</html>
```

o   notificationRegister.jsp

```
<%--
    Document   : notificationRegister
    Created on : 31 May 2024, 11:33:07 pm
```

```
     Author      : Ahmad Afif Syahmi bin Ahmad Rozali
--%>

<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib prefix="c" uri="jakarta.tags.core" %>
<!DOCTYPE html>
<html>
    <head>
        <meta http-equiv="Content-Type" content="text/html;
charset=UTF-8">
        <title>Student Registration</title>
        <link rel="stylesheet"
href="https://cdn.jsdelivr.net/npm/bootstrap@4.6.2/dist/css/boot
strap.min.css" integrity="sha384-
xOolHFLEh07PJGoPkLv1IbcEPTNtaed2xpHsD9ESMhqIYdOnLMwNLD69Npy4HI+N
" crossorigin="anonymous">
    </head>
    <body>
        <div class="container mt-3">
            <c:if test="${addSuccess}" >
                <<h2 class="text-center">Student Registration
Successful!</h2>
            </c:if>
            <c:if test="${!addSuccess}" >
                <h2 class="text-center">Student Registration
Unsuccessful!</h2>
            </c:if>
        </div>
    </body>
</html>
```
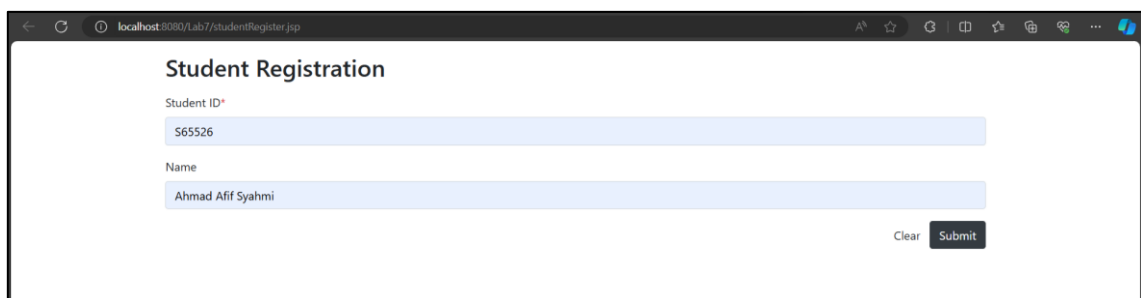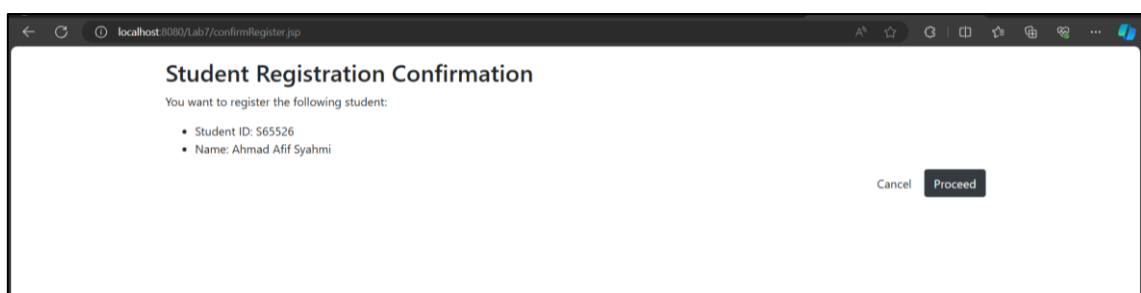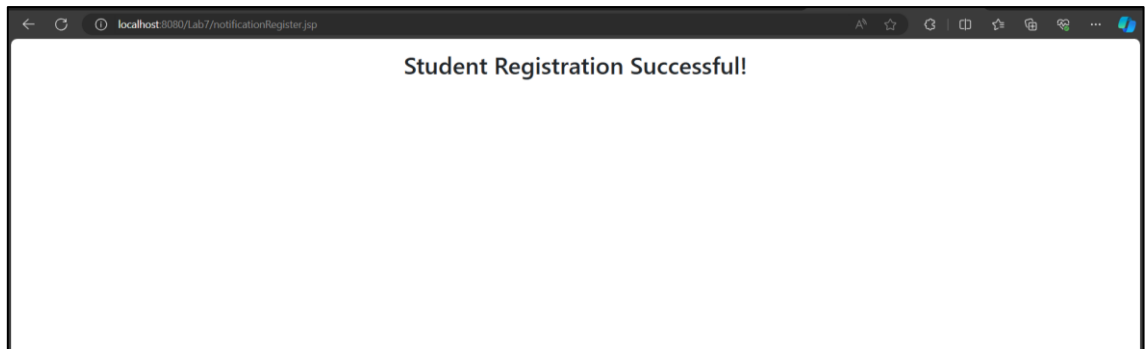
- Output:

Student Registration Successful!

Result Grid | Filter Rows: | Edit:

	studID	studName
▶	S65526	Ahmad Afif Syahmi
✱	NULL	NULL