**Problem Statement 2:**

**Login:**

<%@ page isErrorPage=*"false"* %>

<!DOCTYPE html>

<html>

<head>

    <title>Login</title>

</head>

<body>

    <h2>Login</h2>

    <form action=*"LoginServlet"* method=*"post"*>

        <label for=*"username"*>Username:</label>

        <input type=*"text"* id=*"username"* name=*"username"* required><br><br>

        <label for=*"password"*>Password:</label>

        <input type=*"password"* id=*"password"* name=*"password"* required><br><br>

        <input type=*"submit"* value=*"Login"*>

    </form>

    <div style="color:*red*;">

        <%= request.getAttribute("errorMessage") %>

    </div>

</body>

</html>

**Welcome:**

<%@ page session=*"true"* %>

<%@ page isErrorPage=*"false"* %>

<!DOCTYPE html>

<html>

<head>

    <title>Welcome</title>

</head>

<body>

    <h2>Welcome, <%= session.getAttribute("Bhogaraju Sai Bharadwaj") %></h2>

    <p>You have logged in successfully.</p>

    <a href=*"LogoffServlet"*>Logoff</a>

</body>

</html>

**Error:**

<%@ page isErrorPage=*"true"* %>

<!DOCTYPE html>

<html>

<head>

    <title>Error</title>

</head>

<body>

    <h2>Error</h2>

    <p style="color:*blue*;"><%= exception.getMessage() %></p>

    <a href=*"login.jsp"*>Go to Login Page</a>

</body>

</html>

**LoginBO:**

**package** com.example.bo;

**import** com.example.dao.LoginDAO;

**import** com.example.bo.BusinessException;

**import** com.example.bo.InvalidUserException;

**import** com.example.model.User;

**public** **class** LoginBO {

**public** **boolean** validate(User user) **throws** Exception {

**if** (user.getUsername() == **null** || user.getUsername().isEmpty() ||

            user.getPassword() == **null** || user.getPassword().isEmpty()) {

**throw** **new** BusinessException("Invalid Username/Password");

        }

        LoginDAO dao = **new** LoginDAO();

**return** dao.checkCredentials(user);

    }

}

**LoginDAO:**

**package** com.example.dao;

**import** com.example.bo.BusinessException;

**import** com.example.bo.InvalidUserException;

**import** com.example.model.User;

**import** java.sql.Connection;

**import** java.sql.DriverManager;

**import** java.sql.PreparedStatement;

**import** java.sql.ResultSet;

**import** java.sql.SQLException;

**public** **class** LoginDAO {

**public** **boolean** isValidUser(User user) **throws** BusinessException {

**boolean** isValid = **false**;

        String url = "jdbc:mysql://localhost:3306/logindb";

        String username = "root";

        String password = "Password@12";

**try** (Connection connection = DriverManager.*getConnection*(url, username, password)) {

            String sql = "SELECT \* FROM users WHERE username = ? AND password = ?";

            PreparedStatement statement = connection.prepareStatement(sql);

            statement.setString(1, user.getUsername());

            statement.setString(2, user.getPassword());

            ResultSet resultSet = statement.executeQuery();

**if** (resultSet.next()) {

                isValid = **true**;

            } **else** {

**throw** **new** InvalidUserException("Invalid username or password");

            }

        } **catch** (SQLException e) {

**throw** **new** BusinessException("Database error: " + e.getMessage());

        }

**return** isValid;

    }

}

**Business Exception:**

**package** com.example.bo;

**public** **class** BusinessException **extends** Exception {

**public** BusinessException(String message) {

**super**(message);

    }

}

**InvalidUserException:**

**package** com.example.bo;

**public** **class** InvalidUserException **extends** BusinessException {

**public** InvalidUserException(String message) {

**super**(message);

    }

}

**LoginServlet:**

**package** com.example.servlet;

**import** com.example.bo.LoginBO;

**import** com.example.model.User;

**import** javax.servlet.ServletException;

**import** java.io.IOException;

**public** **class** LoginServlet **extends** HttpServlet {

    @Override

**protected** **void** doPost(HttpServletRequest request, HttpServletResponse response) **throws** ServletException, IOException {

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

        String password = request.getParameter("password");

        User user = **new** User(username, password);

        LoginBO loginBO = **new** LoginBO();

**try** {

**if** (loginBO.validate(user)) {

                HttpSession session = request.getSession();

                session.setAttribute("user", user);

                response.sendRedirect("welcome.html");

            } **else** {

                request.setAttribute("errorMessage", "Invalid Username/Password");

                request.getRequestDispatcher("login.html").forward(request, response);

            }

        } **catch** (Exception e) {

            request.setAttribute("errorMessage", "An error occurred. Please try again.");

            request.getRequestDispatcher("login.html").forward(request, response);

        }

    }

}

**LogOffServlet:**

**package** com.example.servlet;

**import** javax.servlet.ServletException;

**import** jakarta.servlet.http.HttpServlet;

**import** jakarta.servlet.http.HttpSession;

**import** java.io.IOException;

**public** **class** LogoffServlet **extends** HttpServlet {

    @Override

**protected** **void** doGet(HttpServletRequest request, HttpServletResponse response) **throws** ServletException, IOException {

        HttpSession session = request.getSession(**false**);

**if** (session != **null**) {

            session.invalidate();

        }

        response.sendRedirect("login.html");

    }

}

**User:**

**package** com.example.model;

**public** **class** User {

**private** String username;

**private** String password;

**public** User(String username, String password) {

**this**.username = username;

**this**.password = password;

    }

**public** String getUsername() {

**return** username;

    }

**public** **void** setUsername(String username) {

**this**.username = username;

    }

**public** String getPassword() {

**return** password;

    }

**public** **void** setPassword(String password) {

**this**.password = password;

    }

}

**XML:**

<?xml version=*"1.0"* encoding=*"UTF-8"*?>

<web-app xmlns:xsi=*"http://www.w3.org/2001/XMLSchema-instance"*

xmlns=*"https://jakarta.ee/xml/ns/jakartaee"*

xsi:schemaLocation=*"https://jakarta.ee/xml/ns/jakartaee* [***https://jakarta.ee/xml/ns/jakartaee/web-app\_5\_0.xsd***](https://jakarta.ee/xml/ns/jakartaee/web-app_5_0.xsd)*"*

id=*"WebApp\_ID"* version=*"5.0"*>

<display-name>Login Application</display-name>

<!-- Welcome File List -->

<welcome-file-list>

<welcome-file>login.jsp</welcome-file>

</welcome-file-list>

</web-app>