**Problem Statement 3:**

CREATE DATABASE userdb;

USE userdb;

CREATE TABLE users (

    id INT AUTO\_INCREMENT PRIMARY KEY,

    first\_name VARCHAR(80),

    last\_name VARCHAR(80),

    country VARCHAR(80),

    languages\_known TEXT,  -- //Using TEXT because MySQL does not have an array type.

    gender VARCHAR(20)

);

INSERT INTO users (first\_name, last\_name, country, languages\_known, gender)

VALUES ('Bhogaraju', 'Bharadwaj', 'India', 'English,Telugu', 'male');

**RegisterDAO:**

**import** java.sql.\*;

**public** **class** RegisterDAO {

**public** **void** registerUser(User user) **throws** SQLException, ClassNotFoundException {

Class.*forName*("com.mysql.jdbc.Driver");

**try** (Connection connection = DriverManager.*getConnection*("jdbc:mysql://localhost:3306/userdb", "root", "Password@12")) {

String query = "INSERT INTO users (first\_name, last\_name, country, languages\_known, gender) VALUES (?, ?, ?, ?, ?)";

**try** (PreparedStatement ps = connection.prepareStatement(query, Statement.***RETURN\_GENERATED\_KEYS***)) {

ps.setString(1, user.getFirstName());

ps.setString(2, user.getLastName());

ps.setString(3, user.getCountry());

ps.setString(4, String.*join*(",", user.getLanguagesKnown()));

ps.setString(5, user.getGender());

ps.executeUpdate();

**try** (ResultSet rs = ps.getGeneratedKeys()) {

**if** (rs.next()) {

user.setRegistrationId(rs.getString(1));

}

}

}

}

}

}

**RegistrationServlet:**

**import** java.io.IOException;

**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;

@WebServlet("/register")

**public** **class** RegistrationServlet **extends** HttpServlet {

**protected** **void** doPost(HttpServletRequest request, HttpServletResponse response)

**throws** ServletException, IOException {

User user = **new** User();

user.setFirstName(request.getParameter("firstName"));

user.setLastName(request.getParameter("lastName"));

user.setCountry(request.getParameter("country"));

user.setLanguagesKnown(request.getParameterValues("languages"));

user.setGender(request.getParameter("gender"));

RegistrationBO registrationBO = **new** RegistrationBO();

**try** {

registrationBO.validateUser(user);

RegisterDAO registerDAO = **new** RegisterDAO();

**try** {

registerDAO.registerUser(user);

} **catch** (ClassNotFoundException e) {

// **TODO** Auto-generated catch block

e.printStackTrace();

}

request.setAttribute("user", user);

request.getRequestDispatcher("successPage.jsp").forward(request, response);

} **catch** (BusinessException e) {

request.setAttribute("errorMessage", e.getMessage());

request.getRequestDispatcher("error.jsp").forward(request, response);

} **catch** (SQLException e) {

**throw** **new** ServletException("Database error", e);

}

}

}

**RegistrationBO:**

**public** **class** RegistrationBO {

**public** **void** validateUser(User user) **throws** BusinessException {

**if** (user.getFirstName() == **null** || user.getFirstName().trim().isEmpty()) {

**throw** **new** BusinessException("First Name is required.");

}

**if** (user.getLastName() == **null** || user.getLastName().trim().isEmpty()) {

**throw** **new** BusinessException("Last Name is required.");

}

**if** (user.getCountry() == **null** || user.getCountry().trim().isEmpty()) {

**throw** **new** BusinessException("Country is required.");

}

**if** (user.getLanguagesKnown() == **null** || user.getLanguagesKnown().length == 0) {

**throw** **new** BusinessException("At least one language must be selected.");

}

**if** (user.getGender() == **null** || user.getGender().trim().isEmpty()) {

**throw** **new** BusinessException("Gender is required.");

}

}

}

**User:**

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

**private** String firstName;

**private** String lastName;

**private** String country;

**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;

}

**public** String getCountry() {

**return** country;

}

**public** **void** setCountry(String country) {

**this**.country = country;

}

**public** String[] getLanguagesKnown() {

**return** languagesKnown;

}

**public** **void** setLanguagesKnown(String[] languagesKnown) {

**this**.languagesKnown = languagesKnown;

}

**public** String getGender() {

**return** gender;

}

**public** **void** setGender(String gender) {

**this**.gender = gender;

}

**public** String getRegistrationId() {

**return** registrationId;

}

**public** **void** setRegistrationId(String registrationId) {

**this**.registrationId = registrationId;

}

**private** String[] languagesKnown;

**private** String gender;

**private** String registrationId;

}

**BusinessException:**

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

**public** BusinessException(String message) {

**super**(message);

}

}

**XML Code**

**web.xml**

<web-app xmlns=*"http://xmlns.jcp.org/xml/ns/javaee"*

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

xsi:schemaLocation=*"http://xmlns.jcp.org/xml/ns/javaee*

[*http://xmlns.jcp.org/xml/ns/javaee/web-app\_3\_1.xsd*](http://xmlns.jcp.org/xml/ns/javaee/web-app_3_1.xsd)*"*

version=*"3.1"*>

<display-name>advjavques3</display-name>

<welcome-file-list>

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

</welcome-file-list>

</web-app>

**registration.jsp:**

<%@ page language=*"java"* contentType=*"text/html; charset=UTF-8"* pageEncoding=*"UTF-8"*%>

<!DOCTYPE html>

<html>

<head>

<title>Registration</title>

<style>

*.error* { color: *red*; }

</style>

</head>

<body>

<h2>User Registration</h2>

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

First Name: <input type=*"text"* name=*"firstName"* required/><br/>

Last Name: <input type=*"text"* name=*"lastName"* required/><br/>

Country:

<select name=*"country"* required>

<option value=*""*>Select Country</option>

<option value=*"USA"*>USA</option>

<option value=*"Canada"*>Canada</option>

<option value=*"India"*>India</option>

<!-- Add more countries as needed -->

</select><br/>

Languages Known: <br/>

<input type=*"checkbox"* name=*"languages"* value=*"English"*/> English<br/>

<input type=*"checkbox"* name=*"languages"* value=*"Korean"*/> Korean<br/>

<input type=*"checkbox"* name=*"languages"* value=*"French"*/> French<br/>

<!-- Add more languages as needed -->

<br/>

Gender:

<input type=*"radio"* name=*"gender"* value=*"Male"* required/> Male

<input type=*"radio"* name=*"gender"* value=*"Female"* required/> Female

<input type=*"radio"* name=*"gender"* value=*"Other"* required/> Other<br/>

<input type=*"submit"* value=*"Submit"*/>

<input type=*"reset"* value=*"Reset"*/>

</form>

</body>

</html>

**successPage.jsp:**

<!DOCTYPE html>

<html>

<head>

<title>Registration Success</title>

</head>

<body>

<h2>Registration Successful</h2>

<p>Thank you</p>

<a href=*"registration.jsp"*>For New User</a>

</body>

</html>

**error.jsp:**

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

<!DOCTYPE html>

<html>

<head>

<title>Error</title>

<style>

*.error* { color: *red*; }

</style>

</head>

<body>

<h2>Error</h2>

<p class=*"error"*><%= request.getAttribute("errorMessage") %></p>

<a href=*"registration.jsp"*>Back to Registration</a>

</body>

</html>