

13.Design a controller with servlet that provides the interaction with application developed in experiment 1 and the database created in experiment9.

Aim: To design a servlet controller that interacts with the front-end application (from **Experiment 1**) and the database (from **Experiment 5**) for seamless integration. The servlet will handle requests like user registration and database interactions.

Step-by-Step Procedure

1. Setup Environment

Ensure you have:

- **Java Development Kit (JDK) installed.**
- **Apache Tomcat configured.**
- **XAMPP running MySQL for database connectivity.**
- **The JDBC driver (mysql-connector-java.jar) added to the WEB-INF/lib folder or Tomcat's lib directory.**

2.Directory Structure

registrationapplication/

|— **registration.html**

|— **register.jsp**

|— **WEB-INF**

 |— **web.xml**

3. Database Setup

Use the database created in Experiment9. For example, a register table:

create table register(name varchar(10),password varchar(10),Phonenumber int(10),EmailID varchar(10));

4. Front-End Interaction (HTML Form)

HTML form from Experiment 1 to capture user details:

registration.html

```
<!DOCTYPE html>
<html lang="en">
<head>
```

```

<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<title>Validation</title>
<style>
    body {
        background-color: magenta;
        font-family: Arial, sans-serif;
        color: white;
    }
    h1 {
        text-align: center;
    }
    table {
        margin: auto;
        border-spacing: 10px;
    }
    td {
        padding: 5px;
    }
    input[type="text"], input[type="password"] {
        width: 100%;
        padding: 5px;
    }
    input[type="submit"], input[type="reset"] {
        padding: 5px 10px;
        cursor: pointer;
    }
</style>
</head>
<body>
    <form action="register.jsp" method="post">
        <h1>Registration Form</h1>
        <table>
            <tr>
                <td><label for="t1">Name:</label></td>
                <td><input type="text" id="t1" name="t1" minlength="6" required></td>
            </tr>
            <tr>
                <td><label for="t2">Password:</label></td>
                <td><input type="password" id="t2" name="t2" required></td>
            </tr>
            <tr>
                <td><label for="t3">Phone Number:</label></td>
                <td><input type="text" id="t3" name="t3" pattern="\d{10}" title="Enter a valid
10-digit phone number" required></td>
            </tr>
            <tr>
                <td><label for="t4">E-mail ID:</label></td>
                <td><input type="email" id="t4" name="t4" required></td>
            </tr>

```

```

        <tr>
            <td><input type="submit" value="Submit"></td>
            <td><input type="reset" value="Cancel"></td>
        </tr>
    </table>
</form>
</body>
</html>

```

JSP code based on the provided HTML form:

register.jsp

```

<%@ page language="java" import="java.sql.*" %>
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>Registration</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            background-color: #f4f4f9;
            color: #333;
            padding: 20px;
        }
        h3 {
            color: green;
        }
        .error {
            color: red;
        }
    </style>
</head>
<body>
<%
    String v1 = request.getParameter("t1"); // Name
    String v2 = request.getParameter("t2"); // Password
    String v3 = request.getParameter("t3"); // Phone number
    String v4 = request.getParameter("t4"); // E-mail ID
    Connection cn = null;
    PreparedStatement pst = null;

    try {
        // Load the MySQL driver
        Class.forName("com.mysql.cj.jdbc.Driver");

        // Establish the connection
        cn = DriverManager.getConnection("jdbc:mysql://localhost:3306/mydb", "root", "");

```

```

        // SQL query using PreparedStatement to avoid SQL injection
        String query = "INSERT INTO register (name, password, phonenumber, emailid)
VALUES (?, ?, ?, ?)";
        pst = cn.prepareStatement(query);

        // Set parameters for the query
        pst.setString(1, v1);
        pst.setString(2, v2);
        pst.setString(3, v3); // Assuming v3 is a string, adjust accordingly if numeric
        pst.setString(4, v4);

        // Execute the query
        int rowsInserted = pst.executeUpdate();

        // Feedback to the user
        if (rowsInserted > 0) {
            out.println("<h3>Registration Successful</h3>");
        } else {
            out.println("<h3 class='error'>Registration Failed</h3>");
        }
    } catch (NumberFormatException e) {
        out.println("<h3 class='error'>Invalid phone number format: " + e.getMessage() +
"</h3>");
    } catch (SQLException e) {
        out.println("<h3 class='error'>Database error: " + e.getMessage() + "</h3>");
    } catch (Exception e) {
        out.println("<h3 class='error'>Unexpected error: " + e.getMessage() + "</h3>");
    } finally {
        // Close resources
        try {
            if (pst != null) pst.close();
            if (cn != null) cn.close();
        } catch (SQLException e) {
            out.println("<h3 class='error'>Error closing resources: " + e.getMessage() + "</h3>");
        }
    }
}
%>
</body>
</html>

```

web.xml Configuration

Configure the servlet in the web.xml file.

web.xml

```

<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns="http://java.sun.com/xml/ns/javaee"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"

```

```

        xsi:schemaLocation="http://java.sun.com/xml/ns/javaee
                           http://java.sun.com/xml/ns/javaee/web-app_3_0.xsd"
        version="3.0">
<!-- Metadata about the application -->
<display-name>Registration Application</display-name>

<!-- Servlet mapping for specific servlets (optional) -->
<servlet>
    <servlet-name>RegisterServlet</servlet-name>
    <jsp-file>/register.jsp</jsp-file>
</servlet>
<servlet-mapping>
    <servlet-name>RegisterServlet</servlet-name>
    <url-pattern>/register</url-pattern>
</servlet-mapping>
</web-app>

```

5. Deployment Steps

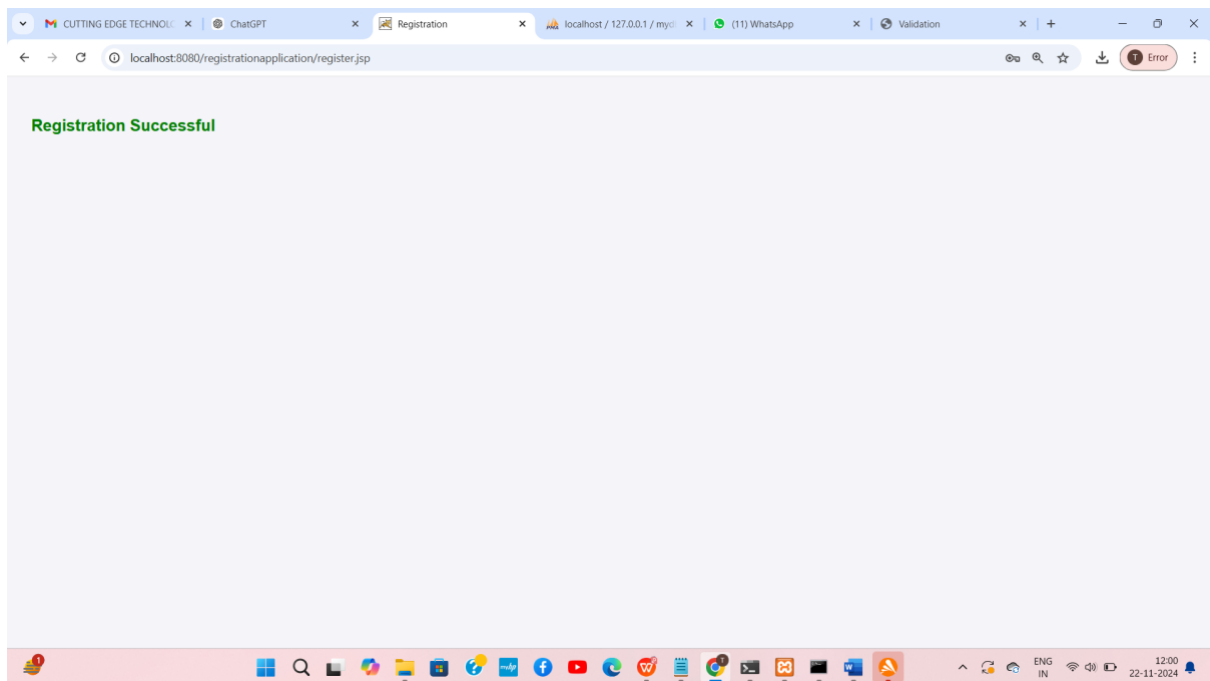
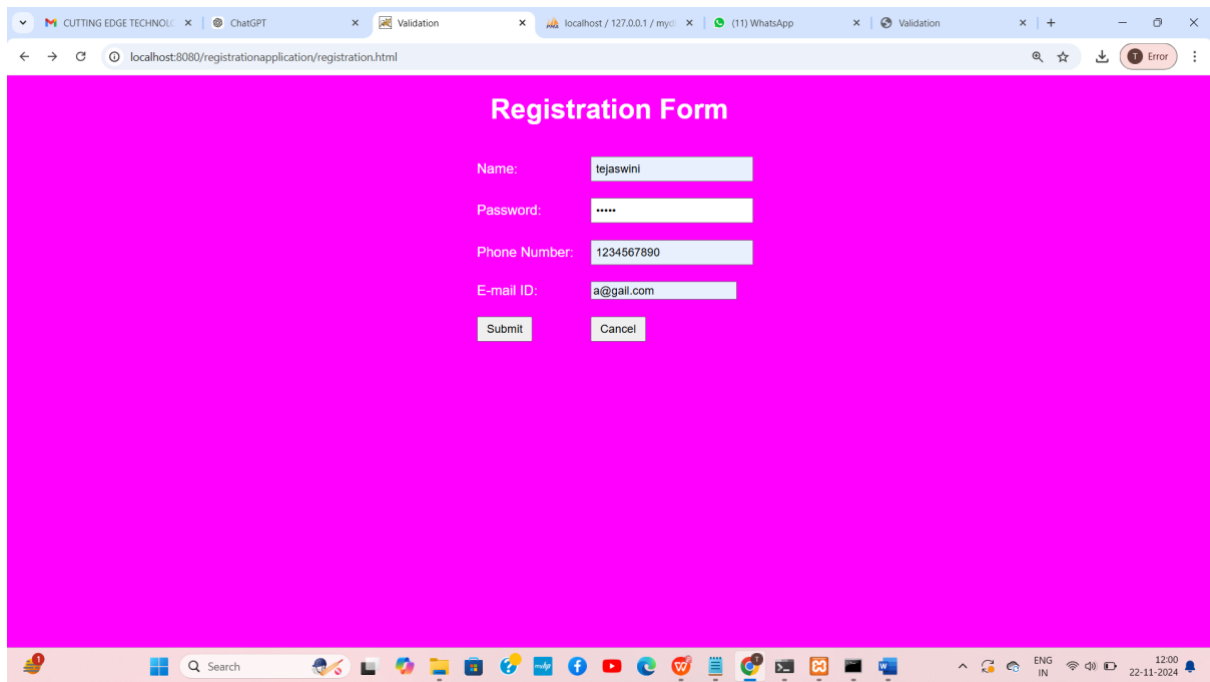
1. Place the web.xml file in the WEB-INF folder.
2. Start the Tomcat server/xamp(start the services-apache, mysql, tomcat)
3. Access the application in the browser:

URL:

[http://localhost:8080/ registrationapplication/registration.html](http://localhost:8080/registrationapplication/registration.html)

6. Testing the Application

1. Open the registration form.
2. Fill in the details and click **submit**.
3. Verify the message displayed after submission.
4. Check the register table in the database for the inserted record.



```
MySQL 8.0 Command Line Cli  X  +  v

Query OK, 0 rows affected (0.07 sec)

mysql> desc register;
+-----+-----+-----+-----+-----+-----+
| Field      | Type      | Null | Key | Default | Extra |
+-----+-----+-----+-----+-----+-----+
| name       | varchar(10) | YES  |     | NULL    |       |
| password   | varchar(10) | YES  |     | NULL    |       |
| Phonenumbe | int(10)    | YES  |     | NULL    |       |
| EmailID    | varchar(10) | YES  |     | NULL    |       |
+-----+-----+-----+-----+-----+-----+
4 rows in set (0.06 sec)

mysql> select * from register;
ERROR 2013 (HY000): Lost connection to MySQL server during query
No connection. Trying to reconnect...
Connection id: 11
Current database: mydb

+-----+-----+-----+-----+
| name       | password | Phonenumbe | EmailID |
+-----+-----+-----+-----+
| tejaswini | 1234     | 1234567890 | a@gail.com |
+-----+-----+-----+-----+
1 row in set (0.01 sec)

mysql> commit;
Query OK, 0 rows affected (0.00 sec)

mysql> |
```