Experiment-8

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Subject Name: Project Based Learning in Java   **Subject Code:** 22CSH-359

1. **Aim:**
   a. Write a servlet to accept user credentials through an HTML form and display a personalized welcome message if the login is successful.
   b. Create a servlet integrated with JDBC to display a list of employees from a database. Include a search form to fetch employee details by ID.
   c. Develop a JSP-based student portal. Include a form for entering attendance details and save them to the database using a servlet.

2. **Objective:** The objective is to develop web applications using Servlets and JSP for user input handling, database integration.

3. **Implementation/Code:**
a)
HTML code:

```
<!DOCTYPE html>
<html>
<head>
   <title>Login Page</title>
</head>
<body>
   <h2>Login</h2>
   <form action="LoginServlet" method="post">
      <label>Username:</label>
      <input type="text" name="username" required><br><br>

      <label>Password:</label>
      <input type="password" name="password" required><br><br>

      <input type="submit" value="Login">
   </form>
```

</body> </html>

Java code: import java.io.IOException;
import java.io.PrintWriter; import
javax.servlet.ServletException; import
javax.servlet.annotation.WebServlet; import
javax.servlet.http.HttpServlet; import
javax.servlet.http.HttpServletRequest; import
javax.servlet.http.HttpServletResponse;

```java
@WebServlet("/LoginServlet")
public class LoginServlet extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html");
PrintWriter out = response.getWriter();

        // Retrieve username and password
        String username = request.getParameter("username");
        String password = request.getParameter("password");

        // Hardcoded credentials for validation (Replace with DB authentication)
if ("admin".equals(username) && "password123".equals(password)) {
out.println("<h2>Welcome, " + username + "!</h2>");
        } else {
            out.println("<h2>Invalid Username or Password</h2>");
        }
        out.close();
    }
}
```

```
Username: admin
Password: password123
```

```
Welcome, admin!
```

(a)

b) Sql code:

```sql
CREATE DATABASE CompanyDB; USE
CompanyDB;

CREATE TABLE employees (          id INT
PRIMARY KEY AUTO_INCREMENT,      name
VARCHAR(100)  NOT  NULL,          position
VARCHAR(100),
   salary DECIMAL(10,2)
);

INSERT INTO employees (name, position, salary) VALUES
('Alice Johnson', 'Software Engineer', 75000.00),
('Bob Smith', 'Manager', 90000.00), ('Charlie
Brown', 'Analyst', 65000.00);
```

Java code:
```java
import java.io.IOException;
import java.io.PrintWriter; import
java.sql.Connection; import
java.sql.DriverManager; import
java.sql.PreparedStatement; import
java.sql.ResultSet; import
javax.servlet.ServletException; import
javax.servlet.annotation.WebServlet; import
javax.servlet.http.HttpServlet; import
javax.servlet.http.HttpServletRequest; import
javax.servlet.http.HttpServletResponse;

@WebServlet("/EmployeeServlet") public class
EmployeeServlet extends HttpServlet {
   private static final String JDBC_URL = "jdbc:mysql://localhost:3306/
CompanyDB";
   private static final String JDBC_USER = "root"; // Change as per your MySQL
      setup
   private static final String JDBC_PASS = "password"; // Change accordingly
```

```java
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        response.setContentType("text/html");
PrintWriter out = response.getWriter();

    try {
        Class.forName("com.mysql.cj.jdbc.Driver");
        Connection conn = DriverManager.getConnection(JDBC_URL,
    JDBC_USER, JDBC_PASS);

        String searchId = request.getParameter("id");
String query = "SELECT * FROM employees";

        if (searchId != null && !searchId.isEmpty()) {
query += " WHERE id = ?";
        }

        PreparedStatement stmt = conn.prepareStatement(query);

        if (searchId != null && !searchId.isEmpty()) {
stmt.setInt(1, Integer.parseInt(searchId));
        }

        ResultSet rs = stmt.executeQuery();

        out.println("<html><head><title>Employee List</title></head><body>");
out.println("<h2>Employee Details</h2>");
        out.println("<form action='EmployeeServlet' method='GET'>");
        out.println("Search by ID: <input type='text' name='id'/> <input type='submit'
    value='Search'/>");
        out.println("</form><br>");
        out.println("<table border='1'><tr><th>ID</th><th>Name</
    th><th>Position</th><th>Salary</th></tr>");

        boolean found = false;          while (rs.next()) {
found = true;            out.println("<tr><td>" + rs.getInt("id") +
"</td>");           out.println("<td>" + rs.getString("name") +
```

```
"</td>");                out.println("<td>" + rs.getString("position") +
"</td>");                out.println("<td>" + rs.getDouble("salary") +
"</td></tr>");
        }

        if (!found) {
            out.println("<tr><td colspan='4'>No Employee Found</td></tr>");
        }

        out.println("</table></body></html>");

        rs.close();
stmt.close();
conn.close();        } catch
(Exception e) {
        out.println("<h3>Error: " + e.getMessage() + "</h3>");
    }
  } }
```

XML code:

```
<web-app>
  <servlet>
    <servlet-name>EmployeeServlet</servlet-name>
    <servlet-class>EmployeeServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>EmployeeServlet</servlet-name>
    <url-pattern>/EmployeeServlet</url-pattern>
  </servlet-mapping>
</web-app>
```

Employees List

ID	Name	Position	Salary
1	Alice Johnson	Software Engineer	75000.00
2	Bob Smith	Manager	90000.00
3	Charlie Brown	Analyst	65000.00

ID 2 searching

ID	Name	Position	Salary
2	Bob Smith	Manager	90000.00

(b)

c)

Sql code:

```sql
CREATE DATABASE StudentDB; USE
StudentDB;

CREATE TABLE student_attendance (     id INT PRIMARY
KEY    AUTO_INCREMENT,                student_name
VARCHAR(100)    NOT    NULL,              roll_number
VARCHAR(20) UNIQUE NOT NULL,     attendance_status
ENUM('Present', 'Absent') NOT NULL,
    date DATE NOT NULL
);
```

Java code:
```java
import java.io.IOException;
import java.io.PrintWriter; import
java.sql.Connection; import
java.sql.DriverManager; import
java.sql.PreparedStatement; import
java.sql.ResultSet; import
javax.servlet.ServletException; import
javax.servlet.annotation.WebServlet; import
javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest; import
javax.servlet.http.HttpServletResponse;

@WebServlet("/AttendanceServlet")
public class AttendanceServlet extends HttpServlet {     private static final String
JDBC_URL = "jdbc:mysql://localhost:3306/StudentDB";     private static final String
JDBC_USER = "root"; // Change as per your MySQL setup
    private static final String JDBC_PASS = "password"; // Change accordingly
```

```java
protected void doPost(HttpServletRequest request, HttpServletResponse response)
    throws ServletException, IOException {
    response.setContentType("text/html");
    PrintWriter out = response.getWriter();

    String name = request.getParameter("studentName");
    String rollNumber = request.getParameter("rollNumber");
    String status = request.getParameter("attendanceStatus");
    String date = request.getParameter("date");

    try {
        Class.forName("com.mysql.cj.jdbc.Driver");
        Connection conn = DriverManager.getConnection(JDBC_URL,
        JDBC_USER, JDBC_PASS);

        String query = "INSERT INTO student_attendance (student_name,
        roll_number, attendance_status, date) VALUES (?, ?, ?, ?)";
        PreparedStatement stmt = conn.prepareStatement(query);
        stmt.setString(1, name);          stmt.setString(2, rollNumber);
        stmt.setString(3, status);
        stmt.setString(4, date);

        int rows = stmt.executeUpdate();
        if (rows > 0) {
            out.println("<h3>Attendance recorded successfully!</h3>");
        }
        stmt.close();
        conn.close();        } catch
    (Exception e) {
        out.println("<h3>Error: " + e.getMessage() + "</h3>");
    }

    out.println("<br><a href='attendance.jsp'>Back to Attendance Form</a>");
}

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

```java
        response.setContentType("text/html");
PrintWriter out = response.getWriter();

    try {
        Class.forName("com.mysql.cj.jdbc.Driver");
        Connection conn = DriverManager.getConnection(JDBC_URL,
    JDBC_USER, JDBC_PASS);

        String query = "SELECT * FROM student_attendance";
        PreparedStatement stmt = conn.prepareStatement(query);
ResultSet rs = stmt.executeQuery();

        out.println("<h2>Student Attendance Records</h2>");
        out.println("<table border='1'><tr><th>ID</th><th>Name</th><th>Roll
    Number</th><th>Status</th><th>Date</th></tr>");

        while (rs.next()) {
            out.println("<tr><td>" + rs.getInt("id") + "</td>");
out.println("<td>" + rs.getString("student_name") + "</td>");
out.println("<td>" + rs.getString("roll_number") + "</td>");
out.println("<td>" + rs.getString("attendance_status") + "</td>");
out.println("<td>" + rs.getString("date") + "</td></tr>");
        }

        out.println("</table>");
        out.println("<br><a href='attendance.jsp'>Back to Attendance Form</a>");

        rs.close();
stmt.close();
conn.close();       } catch
(Exception e) {
        out.println("<h3>Error: " + e.getMessage() + "</h3>");
    }
  }
}
```

XML code:

```xml
<web-app>
  <servlet>
    <servlet-name>AttendanceServlet</servlet-name>
    <servlet-class>AttendanceServlet</servlet-class>
  </servlet>
  <servlet-mapping>
    <servlet-name>AttendanceServlet</servlet-name>
    <url-pattern>/AttendanceServlet</url-pattern>
  </servlet-mapping>
</web-app>
```

JSP code:

```jsp
<%@ page language="java" contentType="text/html; charset=UTF-8"
    pageEncoding="UTF-8"%>
<!DOCTYPE html>
<html>
<head>
  <title>Student Attendance Portal</title>
</head>
<body>
  <h2>Enter Attendance Details</h2>
  <form action="AttendanceServlet" method="post">
    Name: <input type="text" name="studentName" required /><br><br>
Roll Number: <input type="text" name="rollNumber" required /><br><br>
Attendance:
    <select name="attendanceStatus">
      <option value="Present">Present</option>
      <option value="Absent">Absent</option>
    </select><br><br>
    Date: <input type="date" name="date" required /><br><br>
    <input type="submit" value="Submit Attendance">
</form>

  <h3><a href="AttendanceServlet">View Attendance Records</a></h3>
</body>
</html>
```

Attendance form

```
Name: [_____]
Roll Number: [_____]
Attendance: [Present | Absent]
Date: [YYYY-MM-DD]
[Submit Attendance]
```

Viewing Attendance

ID	Name	Roll Number	Status	Date
1	Alice	101	Present	2024-03-19
2	Bob	102	Absent	2024-03-19

(c)

4. Learning Outcome:

- Servlet and JDBC Integration: Understanding how to connect a Java Servlet to a MySQL database.
- Handling HTTP Requests: Learning how to process GET and POST requests to retrieve and display data.
- Database Query Execution: Writing SQL queries in Java to fetch records dynamically.
- Form Handling & User Input: Implementing a search feature to filter employee records.

- Deploying on Tomcat: Deploying a Java web application using Apache Tomcat.
- Error Handling in JDBC: Managing SQL exceptions and debugging database connectivity issues.