Experiment-8

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Branch: BE-CSE **Section/Group** 903-A
Semester: 6TH **Date of Performance:**20-03-25
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) EASY LEVEL

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>
```

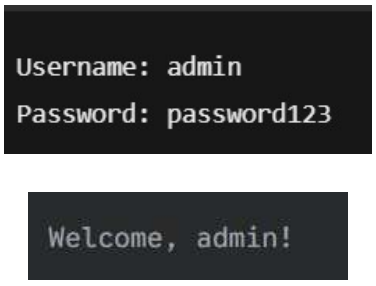
Java code:

```
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;

@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();
    }
}
```



(a)

b) MEDIUM LEVEL

Sql code:

```
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:

```
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

    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	78000.00
2	Bob Smith	Senior Manager	95000.00
3	Charlie Brown	Data Analyst	68000.00
4	David Wilson	HR Specialist	62000.00

ID 2 searching

ID	Name	Position	Salary
3	Charlie Brown	Lead Analyst	88000.00

(b)

c) HARD LEVEL

Sql code:

```
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:

```
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
```

```
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 {
    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:

```
<web-app>
    <servlet>
        <servlet-name>AttendanceServlet</servlet-name>
        <servlet-class>AttendanceServlet</servlet-class>
```

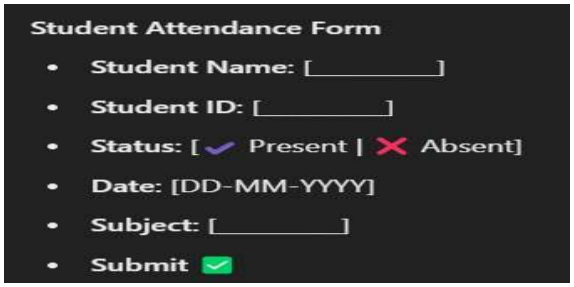
```
    </servlet>
    <servlet-mapping>
        <servlet-name>AttendanceServlet</servlet-name>
        <url-pattern>/AttendanceServlet</url-pattern>
    </servlet-mapping>
</web-app>
```

JSP code:

```
<%@ 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



Viewing Attendance

ID	Name	Roll Number	Status	Date
1	Charlie	103	Present	2024-03-20
2	Daisy	104	Absent	2024-03-20

(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.