

## Experiment-8

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**Semester:** 6TH

**Date of Performance:** 04-04-25

**Subject Name:** Project Based Learning in Java

**Subject Code:** 22CSH-359

### 1. Aim:

- Write a servlet to accept user credentials through an HTML form and display a personalized welcome message if the login is successful.
- 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.
- 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();
    }
}
```

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

```
Welcome, admin!
```

(a)



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## 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'");
    out.println("value='Search'/>");
    out.println("</form><br>");

    out.println("<table");
    out.println("border='1'><tr><th>ID</th><th>Name</th><th>Position</th><th>Salary</th>");
    out.println("</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>
```



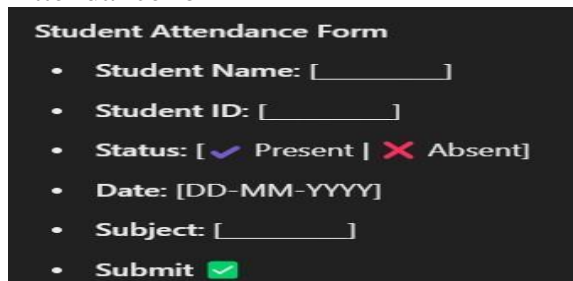
```
</servlet>
<servlet-mapping>
  <servlet-name>AttendanceServlet</servlet-name>
  <url-pattern>/AttendanceServlet</url-pattern>
</servlet-mapping>
</web-app>
```

## 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



The screenshot shows a web form titled "Student Attendance Form" with a dark background. It contains the following fields and elements:

- Student Name: [text input field]
- Student ID: [text input field]
- Status: [dropdown menu showing "Present" with a blue checkmark icon and "Absent" with a red X icon]
- Date: [date input field in DD-MM-YYYY format]
- Subject: [text input field]
- Submit [button with a green checkmark icon]



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## 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.