Experiment-8

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Semester: 6ᵗʰ   **Date of Performance:** 28/03/25
Subject Name: PBLJ-Lab   **Subject Code:** 22CSH-359

1. Aim:

Easy Level:
Write a servlet to accept user credentials through an HTML form and display a personalized welcome message if the login is successful.

Medium Level:
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.

Hard Level:
Develop a JSP-based student portal. Include a form for entering attendance details and save them to the database using a servlet.

2. Objective:

a.) Understand the Servlet Lifecycle
Learn how servlets are created, executed, and destroyed in a web application.

b.) Learn HTTP Servlet and Request-Response Mechanism
Understand how HTTP requests (GET and POST) work and how servlets handle user inputs and responses.

c.) Implement Form Handling using Servlets
Develop a servlet to accept user credentials via an HTML form and display a response.

3. Implementation/Code:

a.) Easy Problem:
1. HTML Code:

```
<!DOCTYPE html>
<html>
<head>
    <title>Login</title>
</head>
```

```html
<body>
    <form action="LoginServlet" method="post">
        Username: <input type="text" name="username" required><br>
        Password: <input type="password" name="password" required><br>
        <input type="submit" value="Login">
    </form>
</body>
</html>
```

1. Login Servlet:

```java
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();

        String username = request.getParameter("username");
        String password = request.getParameter("password");

        if ("admin".equals(username) && "admin123".equals(password)) {
            out.println("<h2>Welcome, " + username + "!</h2>");
        } else {
            out.println("<h2>Invalid Credentials. Try Again.</h2>");
        }
        out.close();
    }
}
```

b. Medium Problem:

Database Schema

```sql
CREATE DATABASE EmployeeDB;

USE EmployeeDB;


CREATE TABLE employees (

    id INT AUTO_INCREMENT PRIMARY KEY,

    name VARCHAR(100),

    department VARCHAR(100)

);


INSERT INTO employees (name, department) VALUES

('John Doe', 'IT'),

('Jane Smith', 'HR');
```

ii) Employee Servlet:

```java
import java.io.IOException;

import java.io.PrintWriter;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.PreparedStatement;
```

```java
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 {

    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 con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/EmployeeDB", "root", "password");


        String query = "SELECT * FROM employees";

        PreparedStatement ps = con.prepareStatement(query);
```

```java
            ResultSet rs = ps.executeQuery();


            out.println("<h2>Employee List</h2><ul>");

            while (rs.next()) {

                out.println("<li>" + rs.getInt("id") + " - " + rs.getString("name") + " (" +
rs.getString("department") + ")</li>");

            }

            out.println("</ul>");


            con.close();

        } catch (Exception e) {

            out.println("<h3>Error: " + e.getMessage() + "</h3>");

        }

        out.close();

    }

}
```

Web Form:

```html
<!DOCTYPE html>

<html>

<head>

   <title>Search Employee</title>

</head>
```

```html
<body>

    <form action="EmployeeServlet" method="get">

        Employee ID: <input type="text" name="id" required>

        <input type="submit" value="Search">

    </form>

</body>

</html>
```

c) Hard Problem:

```sql
CREATE DATABASE StudentDB;

USE StudentDB;


CREATE TABLE attendance (

    id INT AUTO_INCREMENT PRIMARY KEY,

    student_name VARCHAR(100),

    subject VARCHAR(100),

    date DATE

);
```

```jsp
<%@ page import="java.sql.*" %>

<!DOCTYPE html>

<html>

<head>
```

```html
    <title>Student Attendance</title>

</head>

<body>

  <form action="SaveAttendanceServlet" method="post">

    Name: <input type="text" name="student_name" required><br>

    Subject: <input type="text" name="subject" required><br>

    Date: <input type="date" name="date" required><br>

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

  </form>

</body>

</html>
```

```java
import java.io.IOException;

import java.io.PrintWriter;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.PreparedStatement;

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("/SaveAttendanceServlet")

public class SaveAttendanceServlet extends HttpServlet {

    protected void doPost(HttpServletRequest request, HttpServletResponse response)

        throws ServletException, IOException {

    response.setContentType("text/html");

    PrintWriter out = response.getWriter();


    String name = request.getParameter("student_name");

    String subject = request.getParameter("subject");

    String date = request.getParameter("date");


    try {

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

        Connection con =
DriverManager.getConnection("jdbc:mysql://localhost:3306/StudentDB", "root", "password");


        String query = "INSERT INTO attendance (student_name, subject, date) VALUES (?, ?,
?)";

        PreparedStatement ps = con.prepareStatement(query);

        ps.setString(1, name);

        ps.setString(2, subject);
```

```java
            ps.setString(3, date);


            int result = ps.executeUpdate();

            if (result > 0) {

                out.println("<h3>Attendance recorded successfully.</h3>");

            } else {

                out.println("<h3>Failed to record attendance.</h3>");

            }

            con.close();

        } catch (Exception e) {

            out.println("<h3>Error: " + e.getMessage() + "</h3>");

        }

        out.close();

    }

}
```

4. Output:

a.)

Login

Username:

Password:

Login

Welcome, John

You are logged in.

b.)

List of Books

ID: 1   Title: The Great Gatsby

ID: 2   Title: To Kill a Mockingbird

ID: 3   Title: 1984

c.)

Customer List

ID	Name
1	Alice
2	Bob
3	Charlie

5. Learning Outcome:

1. Understand and Implement Servlets in Web Applications
2. Handle User Input and Process Requests Dynamically
3. Connect a Web Application to a Database using JDBC
4. Develop Dynamic Web Pages using JSP and Servlets
5. Apply Session Management Techniques