

Experiment 8

Student Name: Anushka Kotiyal **UID:**22BCS13559

Branch: BE-CSE Section/Group:22BCS-KRG-IOT-3B **Date of Performance:** 15/04/2025 Semester:6th

Subject Name: Project Based Learning Subject Code: 22CSH-359

in Java with Lab

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. (EASY LEVEL)

- (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. (MEDIUM LEVEL)
- (c) Develop a JSP-based student portal. Include a form for entering attendance details and save them to the database using a servlet.(HARD LEVEL)

2. Objective:

- (a) To develop a simple Servlet-based login system that accepts user credentials (e.g., username and password) through an HTML form.
- (b) To develop a java program to create a Servlet that interacts with a MySQL database using JDBC to fetch and display a list of employees.
- (c) To develop a JSP-based Student Portal for managing student attendance. Create a form that allows users to enter attendance details (e.g., student name, ID, subject, status). Use a Servlet to save the attendance data to a MySQL database.

3. Implementation/Code:

(A) Easy Level: <!DOCTYPE html>

```
<html>
<head>
<title>Login Form</title>
```

</head>

<body>

<h2>Login Page</h2>

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

Username: <input type="text" name="username" required>

Password: <input type="password" name="password" required>

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

</form>

</body>

</html>

import java.io.*; import javax.servlet.*;

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import java.sql.*;

```
import javax.servlet.http.*;
  public class LoginServlet extends HttpServlet {
  private static final long serialVersionUID = 1L;
  private static final String USERNAME = "admin";
  private static final String PASSWORD = "password123";
  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 (USERNAME.equals(username) && PASSWORD.equals(password)) {
       out.println("<html><body>");
       out.println("<h2>Welcome, " + username + "!</h2>");
       out.println("</body></html>");
       out.println("<html><body>");
       out.println("<h2>Login failed. Invalid username or password.</h2>");
       out.println("<a href='login.html'>Try again</a>");
       out.println("</body></html>");
<web-app xmlns="http://jakarta.ee/xml/ns/jakartaee"</p>
     version="5.0">
  <servlet>
     <servlet-name>LoginServlet</servlet-name>
     <servlet-class>LoginServlet</servlet-class>
  </servlet>
  <servlet-mapping>
     <servlet-name>LoginServlet</servlet-name>
     <url>pattern>/LoginServlet</url-pattern></url-pattern>
  </servlet-mapping>
</web-app>
(B) Medium Level:
<!DOCTYPE html>
<html>
<head><title>Employee Search</title></head>
  <form action="EmployeeServlet" method="get">
    Employee ID: <input type="number" name="id">
     <input type="submit" value="Search">
  </form>
</body>
</html>
import java.io.*;
```

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<body>

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```
import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.WebServlet;
public class EmployeeServlet extends HttpServlet {
  protected void doGet(HttpServletRequest req, HttpServletResponse res) throws IOException {
    String id = req.getParameter("id");
    res.setContentType("text/html");
    PrintWriter out = res.getWriter();
    try {
       Class.forName("com.mysql.cj.jdbc.Driver");
       Connection con = DriverManager.getConnection(
         "jdbc:mysql://localhost:3306/company", "root", "your_password");
       PreparedStatement ps = con.prepareStatement("SELECT name, department FROM
   employees WHERE id=?");
      ps.setInt(1, Integer.parseInt(id));
       ResultSet rs = ps.executeQuery();
      if (rs.next()) {
         out.println("<h3>Employee Found</h3>");
         out.println("Name: " + rs.getString("name") + "<br>");
         out.println("Department: " + rs.getString("department"));
         out.println("<h3>No employee found with ID: " + id + "</h3>");
       con.close();
    } catch (Exception e) {
      out.println("Error: " + e.getMessage());
}
(C) Hard Level:
CREATE DATABASE student_portal;
USE student_portal;
CREATE TABLE attendance (
  id INT AUTO_INCREMENT PRIMARY KEY,
  student_name VARCHAR(100),
  roll_no VARCHAR(20),
  subject VARCHAR(100),
  attendance_date DATE,
  status VARCHAR(10)
);
<%@ page language="java" contentType="text/html; charset=UTF-8" %>
<!DOCTYPE html>
<html>
<head>
  <title>Student Attendance Form</title>
</head>
```

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```
<h2>Student Attendance Form</h2>
  <form action="AttendanceServlet" method="post">
    Name: <input type="text" name="student_name" required><br><br>
     Roll No: <input type="text" name="student_id" required><br><br>
     Subject: <input type="text" name="subject" required><br><br>
     Date: <input type="date" name="attendance_date" required><br><br>
     Status:
     <select name="status">
       <option value="Present">Present</option>
       <option value="Absent">Absent
     </select><br><br>
     <input type="submit" value="Submit Attendance">
</body>
</html>
import java.io.*;
import java.sql.*;
import javax.servlet.*;
import javax.servlet.http.*;
import javax.servlet.annotation.WebServlet;
public class AttendanceServlet extends HttpServlet {
  protected void doPost(HttpServletRequest req, HttpServletResponse res) throws IOException,
   ServletException {
    String name = req.getParameter("student_name");
     String roll = req.getParameter("roll_no");
     String subject = req.getParameter("subject");
     String date = req.getParameter("attendance_date");
     String status = req.getParameter("status");
    res.setContentType("text/html");
     PrintWriter out = res.getWriter();
    try {
       Class.forName("com.mysql.cj.jdbc.Driver");
       Connection con = DriverManager.getConnection(
          "jdbc:mysql://localhost:3306/student_portal", "root", "your_password");
       PreparedStatement ps = con.prepareStatement(
          "INSERT INTO attendance (student_name, roll_no, subject, attendance_date, status)
   VALUES (?, ?, ?, ?, ?)"
       ps.setString(1, name);
       ps.setString(2, roll);
       ps.setString(3, subject);
       ps.setString(4, date);
       ps.setString(5, status);
       int i = ps.executeUpdate();
       if (i > 0) {
         out.println("<h3>Attendance Submitted Successfully!</h3>");
         out.println("<h3>Error submitting attendance.</h3>");
```

```
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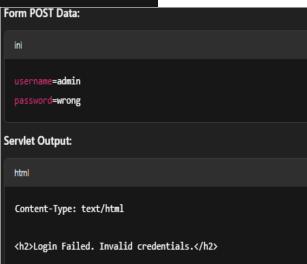
}
con.close();
} catch (Exception e) {
out.println("Error: " + e.getMessage());
}
}
}
```

4. Output:

User opens:	
bash	
http://localhost:8080/YourApp/index.html	

Form POST Data:	
Tomir OST Data.	
ini	
username =admin	
password=1234	
Servlet Output:	
html	
Content-Type: text/html	
<h2>Welcome, admin!</h2>	

Case 1: Correct Credentials



Case 2: Invalid Credentials

(a) Easy Level

```
User opens:

bash

http://localhost:8080/YourApp/index.html
```

MySQL table employees has:

ya Ç		
emp_id	name	department
101	John Doe	HR
102	Alice Roy	π



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POST Request:
ini
empId=101
Simulated Server Execution:
sql
<pre>> Received POST request at /EmployeeServlet > Parameter empId = 101 > Connecting to database > Running query: SELECT * FROM employees WHERE emp_id=101 > Match found!</pre>
Output:
html
Content-Type: text/html
<h2>Employee Details</h2>
ID: 101
Name: John Doe
Department: HR

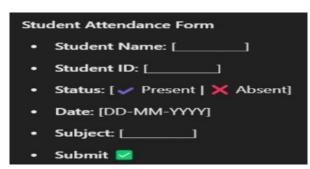
Case 1: Employee Found



Case 2: Employee Not Found

(b) Medium Level

bash
http://localhost:8080/YourAppName/attendance.jsp



Student Attendance Form

Attendance Submitted Successfully!



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

Viewing the attendance (c) Hard Level

5. Learning Outcomes:

- i. Enhanced proficiency in JDBC, enabling seamless database connectivity and execution of SQL queries using DriverManager, Connection, and ResultSet.
- ii. Developed expertise in CRUD operations, implementing structured Create, Read, Update, and Delete functionalities while ensuring data consistency and maintaining relational integrity.
- iii. Strengthened skills in transaction handling, utilizing commit() and rollback() to maintain data integrity and ensure atomicity in database operations, preventing partial or inconsistent data updates.
- iv. Applied MVC architecture, separating concerns between Model, View, and Controller to enhance code maintainability, modularity, and scalability in Java applications.
- v. Improved problem-solving and database management capabilities, leveraging structured programming, error handling, and SQL optimizations to build scalable, efficient, and robust applications.