Experiment 8

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Aim: Servlet Lifecycle, Generic Servlet, Http Servlet, Linking Servlet to HTML, HTTP Servlet Request and Response, Servlet with JDBC, configuring project using servlet, Servlet Config and Servlet Mapping JSP declaration, JSP directives, JSP Script lets, JSP include tag, JSP page tag

Objective: Develop web applications using Servlets and JSP for user input handling, database integration.

Problem 1.

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

Code:

create the HTML login form:

```
<!-- login.html -->
<!DOCTYPE html>
<html>
<head>
  <title>Login Form</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      margin: 40px;
    }
    .login-container {
      width: 300px;
      padding: 20px;
      border: 1px solid #ddd;
      border-radius: 5px;
    }
```

```
        input[type="text"], input[type="password"] {
            width: 100%;
            padding: 10px;
            margin: 8px 0;
            box-sizing: border-box;
        }
        input[type="submit"] {
            background-color: #4CAF50;
            color: white;
            padding: 10px 15px;
            border: none;
            cursor: pointer;
            width: 100%;
        }
    </style>
</head>
<body>
    <div class="login-container">
        <h2>User Login</h2>
        <form action="LoginServlet" method="post">
            <label for="username">Username:</label>
            <input type="text" id="username" name="username" required>
            <label for="password">Password:</label>
            <input type="password" id="password" name="password" required>
            <input type="submit" value="Login">
        </form>
    </div>
</body>
</html>
```

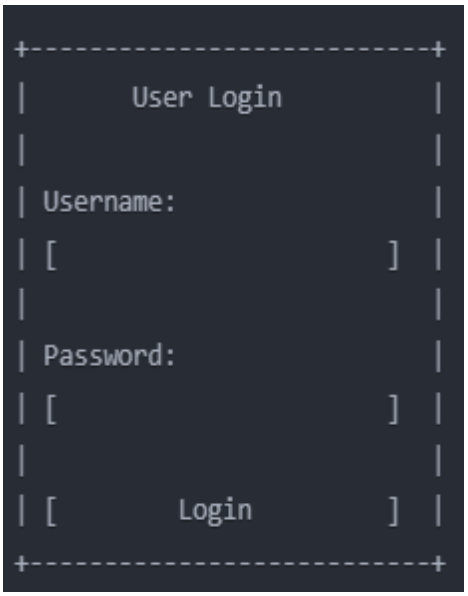
create the servlet to handle the login:

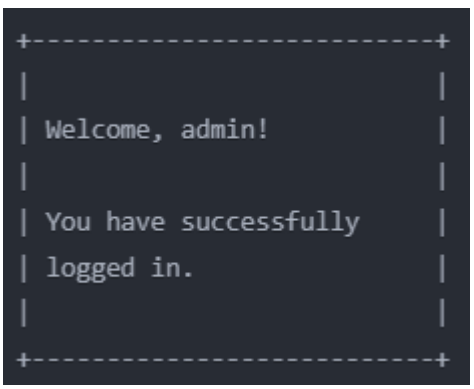
```
// LoginServlet.java
import java.io.IOException;
import java.io.PrintWriter;
```

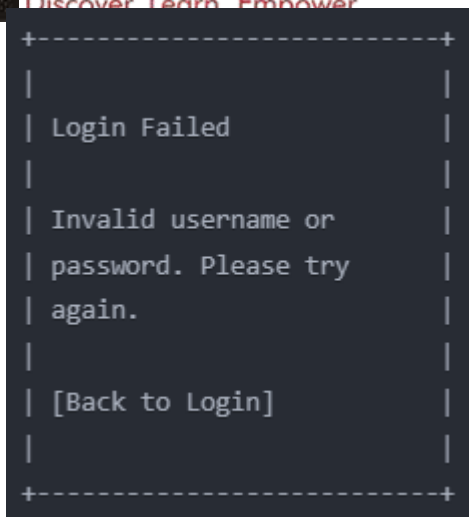
```
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
@WebServlet("/LoginServlet")
public class LoginServlet extends HttpServlet {
    private static final long serialVersionUID = 1L;
    // Hard-coded credentials for demonstration
    private static final String VALID_USERNAME = "admin";
    private static final String VALID_PASSWORD = "password";
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        // Get the form parameters
        String username = request.getParameter("username");
        String password = request.getParameter("password");
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Login Result</title>");
        out.println("<style>");
        out.println("body { font-family: Arial, sans-serif; margin: 40px; }");
        out.println(".message { padding: 20px; border-radius: 5px; margin-top: 20px; }");
        out.println(".success { background-color: #dff0d8; color: #3c763d; }");
        out.println(".error { background-color: #f2dede; color: #a94442; }");
        out.println("</style>");
        out.println("</head>");
        out.println("<body>");
        // Validate credentials
        if (VALID_USERNAME.equals(username) && VALID_PASSWORD.equals(password)) {
            out.println("<div class='message success'>");
```

```
            out.println("<h2>Welcome, " + username + "!</h2>");
            out.println("<p>You have successfully logged in.</p>");
            out.println("</div>");
        } else {
            out.println("<div class='message error'>");
            out.println("<h2>Login Failed</h2>");
            out.println("<p>Invalid username or password. Please try again.</p>");
            out.println("<a href='login.html'>Back to Login</a>");
            out.println("</div>");        }
        out.println("</body>");
        out.println("</html>");
    }
}
```

Output







Problem 2:

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.

Code:

create the database structure:

```
-- Create employee table
CREATE TABLE employees (
    id INT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    position VARCHAR(100),
    salary DECIMAL(10,2),
    hire_date DATE
);
-- Insert some sample data
INSERT INTO employees VALUES (101, 'John Doe', 'Software Engineer', 75000.00, '2020-01-15');
INSERT INTO employees VALUES (102, 'Jane Smith', 'Project Manager', 85000.00, '2019-05-20');
INSERT INTO employees VALUES (103, 'Bob Johnson', 'UI/UX Designer', 70000.00, '2021-03-10');
INSERT INTO employees VALUES (104, 'Alice Williams', 'Database Administrator', 80000.00, '2018-11-05');
INSERT INTO employees VALUES (105, 'Charlie Brown', 'System Analyst', 72000.00, '2020-09-25');
```

create the HTML form for searching employees:

```
<!-- employeeSearch.html -->
<!DOCTYPE html>
```

```
<html>
<head>
  <title>Employee Search</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      margin: 40px;
    }
    .container {
      width: 80%;
      max-width: 800px;
      margin: 0 auto;
    }
    .search-box {
      padding: 20px;
      background-color: #f5f5f5;
      border-radius: 5px;
      margin-bottom: 20px;
    }
    input[type="text"] {
      padding: 8px;
      width: 200px;
    }
    button {
      padding: 8px 15px;
      background-color: #4CAF50;
      color: white;
      border: none;
      cursor: pointer;
    }
    a.button {
```

```
            padding: 8px 15px;
            background-color: #2196F3;
            color: white;
            text-decoration: none;
            border-radius: 3px;
            margin-left: 10px;
        }
    </style>
</head>
<body>
    <div class="container">
        <h1>Employee Directory</h1>
        <div class="search-box">
            <h3>Search Employee by ID</h3>
            <form action="EmployeeServlet" method="get">
                <input type="text" name="empId" placeholder="Enter Employee ID">
                <button type="submit">Search</button>
                <a href="EmployeeServlet" class="button">View All Employees</a>
            </form>
        </div>
    </div>
</body>
</html>
```

create an Employee model class:

```
// Employee.java
import java.util.Date;
public class Employee {
    private int id;
    private String name;
    private String position;
    private double salary;
```

```
    private Date hireDate;

    // Constructors
    public Employee() {}
    public Employee(int id, String name, String position, double salary, Date hireDate) {
        this.id = id;
        this.name = name;
        this.position = position;
        this.salary = salary;
        this.hireDate = hireDate;
    }
    // Getters and Setters
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
    public String getPosition() {
        return position;
    }
    public void setPosition(String position) {
        this.position = position;
    }
    public double getSalary() {
        return salary;
```

```
    }
    public void setSalary(double salary) {
        this.salary = salary;
    }
    public Date getHireDate() {
        return hireDate;
    }
    public void setHireDate(Date hireDate) {
        this.hireDate = hireDate;
    }
}
```

create the EmployeeServlet:

```
// EmployeeServlet.java
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.text.SimpleDateFormat;
import java.util.ArrayList;
import java.util.List;
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 long serialVersionUID = 1L;
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
```

```
        throws ServletException, IOException {
    response.setContentType("text/html");
    PrintWriter out = response.getWriter();
    String empIdParam = request.getParameter("empId");
    Connection conn = null;
    try {
        conn = DBUtil.getConnection();
        List<Employee> employees = new ArrayList<>();
        if (empIdParam != null && !empIdParam.trim().isEmpty()) {
            // Search for specific employee
            int empId = Integer.parseInt(empIdParam);
            PreparedStatement pstmt = conn.prepareStatement(
                    "SELECT * FROM employees WHERE id = ?");
            pstmt.setInt(1, empId);
            ResultSet rs = pstmt.executeQuery();
            while (rs.next()) {
                Employee emp = new Employee();
                emp.setId(rs.getInt("id"));
                emp.setName(rs.getString("name"));
                emp.setPosition(rs.getString("position"));
                emp.setSalary(rs.getDouble("salary"));
                emp.setHireDate(rs.getDate("hire_date"));
                employees.add(emp);
            }
            rs.close();
            pstmt.close();
        } else {
            // Fetch all employees
            PreparedStatement pstmt = conn.prepareStatement("SELECT * FROM employees");
            ResultSet rs = pstmt.executeQuery();
            while (rs.next()) {
```

```
                Employee emp = new Employee();
                emp.setId(rs.getInt("id"));
                emp.setName(rs.getString("name"));
                emp.setPosition(rs.getString("position"));
                emp.setSalary(rs.getDouble("salary"));
                emp.setHireDate(rs.getDate("hire_date"));
                employees.add(emp);
            }
            rs.close();
            pstmt.close();
        }
        // Generate HTML output
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Employee Directory</title>");
        out.println("<style>");
        out.println("body { font-family: Arial, sans-serif; margin: 40px; }");
        out.println(".container { width: 80%; max-width: 800px; margin: 0 auto; }");
        out.println("table { width: 100%; border-collapse: collapse; }");
        out.println("th, td { padding: 10px; text-align: left; border-bottom: 1px solid #ddd; }");
        out.println("th { background-color: #f2f2f2; }");
        out.println(".search-box { padding: 20px; background-color: #f5f5f5; border-radius: 5px; margin-bottom:
20px; }");
        out.println("input[type=\"text\"] { padding: 8px; width: 200px; }");
        out.println("button { padding: 8px 15px; background-color: #4CAF50; color: white; border: none; cursor:
pointer; }");
        out.println("a.button { padding: 8px 15px; background-color: #2196F3; color: white; text-decoration: none;
border-radius: 3px; margin-left: 10px; display: inline-block; }");
        out.println(".no-results { background-color: #f8d7da; color: #721c24; padding: 15px; border-radius: 5px;
}");
        out.println("</style>");
```

```
out.println("</head>");
out.println("<body>");
out.println("<div class='container'>");
out.println("<h1>Employee Directory</h1>");

out.println("<div class='search-box'>");
out.println("<h3>Search Employee by ID</h3>");
out.println("<form action='EmployeeServlet' method='get'>");
out.println("<input type='text' name='empId' placeholder='Enter Employee ID' value='" +
        (empIdParam != null ? empIdParam : "") + "'>");
out.println("<button type='submit'>Search</button>");
out.println("<a href='EmployeeServlet' class='button'>View All Employees</a>");
out.println("</form>");
out.println("</div>");
if (employees.isEmpty()) {
    out.println("<div class='no-results'>");
    out.println("<h3>No employees found</h3>");
    out.println("</div>");
} else {
    out.println("<table>");
    out.println("<tr>");
    out.println("<th>ID</th>");
    out.println("<th>Name</th>");
    out.println("<th>Position</th>");
    out.println("<th>Salary</th>");
    out.println("<th>Hire Date</th>");
    out.println("</tr>");
    SimpleDateFormat dateFormat = new SimpleDateFormat("yyyy-MM-dd");
    for (Employee emp : employees) {
        out.println("<tr>");
        out.println("<td>" + emp.getId() + "</td>");
```

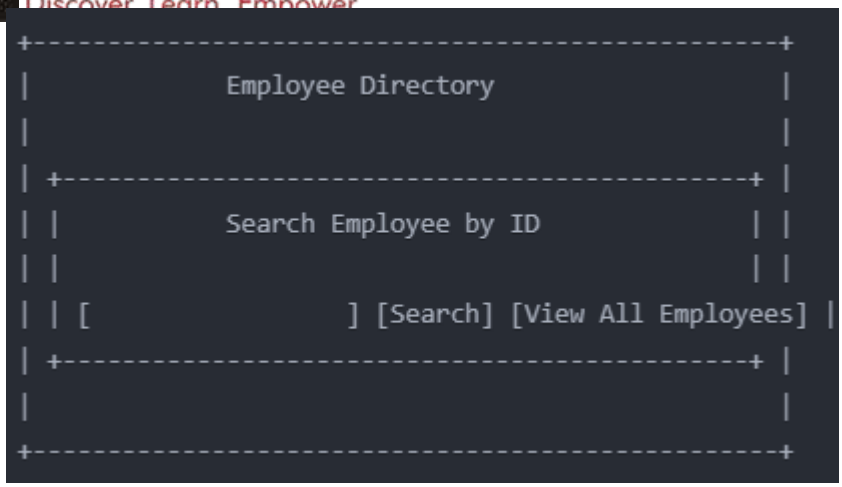
```
                out.println("<td>" + emp.getName() + "</td>");
                out.println("<td>" + emp.getPosition() + "</td>");
                out.println("<td>$" + String.format("%.2f", emp.getSalary()) + "</td>");
                out.println("<td>" + dateFormat.format(emp.getHireDate()) + "</td>");
                out.println("</tr>");
            }
            out.println("</table>");
        }
        out.println("</div>");
        out.println("</body>");
        out.println("</html>");
    } catch (SQLException e) {
        out.println("<h3>Database Error: " + e.getMessage() + "</h3>");
        e.printStackTrace();
    } catch (NumberFormatException e) {
        out.println("<h3>Invalid Employee ID format</h3>");
    } finally {
        DBUtil.closeConnection(conn);
    }
  }
  protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
    doGet(request, response);
  }
}
```

create a DBUtil class to manage database connections:

```
// DBUtil.java
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;
public class DBUtil {
```

```
    private static final String JDBC_URL = "jdbc:mysql://localhost:3306/employeedb";
    private static final String JDBC_USER = "root";
    private static final String JDBC_PASSWORD = "password";
    static {
        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
        } catch (ClassNotFoundException e) {
            e.printStackTrace();
        }
    }
    public static Connection getConnection() throws SQLException {
        return DriverManager.getConnection(JDBC_URL, JDBC_USER, JDBC_PASSWORD);
    }
    public static void closeConnection(Connection conn) {
        if (conn != null) {
            try {
                conn.close();
            } catch (SQLException e) {
                e.printStackTrace();
            }
        }
    }
}
```

Output


Employee Directory
Search Employee by ID
[ ] [Search] [View All Employees]

```
+-------------------------------------------------+
|             Employee Directory                  |
|                                                 |
| +---------------------------------------------+ |
| |           Search Employee by ID             | |
| |                                             | |
| | [                ] [Search] [View All Employees] |
| +---------------------------------------------+ |
|                                                 |
| +---------------------------------------------+ |
| | ID   | Name          | Position       | Salary   | Hire Date  |
| |------|---------------|----------------|----------|------------|
| | 101  | John Doe      | Software Engineer | $75000.00 | 2020-01-15 |
| | 102  | Jane Smith    | Project Manager   | $85000.00 | 2019-05-20 |
| | 103  | Bob Johnson   | UI/UX Designer    | $70000.00 | 2021-03-10 |
| | 104  | Alice Williams| Database Admin    | $80000.00 | 2018-11-05 |
| | 105  | Charlie Brown | System Analyst    | $72000.00 | 2020-09-25 |
| +---------------------------------------------+ |
|                                                 |
+-------------------------------------------------+
```

```
+-------------------------------------------------+
|             Employee Directory                  |
|                                                 |
| +---------------------------------------------+ |
| |           Search Employee by ID             | |
| |                                             | |
| | [102             ] [Search] [View All Employees] |
| +---------------------------------------------+ |
|                                                 |
| +---------------------------------------------+ |
| | ID   | Name          | Position       | Salary   | Hire Date  |
| |------|---------------|----------------|----------|------------|
| | 102  | Jane Smith    | Project Manager   | $85000.00 | 2019-05-20 |
| +---------------------------------------------+ |
|                                                 |
+-------------------------------------------------+
```

Problem 3:

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

Code:

create the database structure:

```
-- Create students table
CREATE TABLE students (
    student_id INT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    class VARCHAR(20),
    section CHAR(1)
);
-- Create attendance table
CREATE TABLE attendance (
    id INT PRIMARY KEY AUTO_INCREMENT,
    student_id INT,
    date DATE NOT NULL,
    status ENUM('Present', 'Absent', 'Late') NOT NULL,
    remarks VARCHAR(255),
    FOREIGN KEY (student_id) REFERENCES students(student_id)
);
```

```
-- Insert sample student data
INSERT INTO students VALUES (1001, 'Alex Johnson', '10', 'A');
INSERT INTO students VALUES (1002, 'Sophia Davis', '10', 'A');
INSERT INTO students VALUES (1003, 'Ethan Wilson', '10', 'B');
INSERT INTO students VALUES (1004, 'Olivia Martin', '10', 'B');
INSERT INTO students VALUES (1005, 'Noah Thompson', '10', 'A');
```

create a DBUtil class:

```
// com.studentportal.util.DBUtil.java
package com.studentportal.util;
import java.sql.Connection;
import java.sql.DriverManager;
import  java.sql.SQLException;
public class DBUtil {
    private static final String JDBC_URL = "jdbc:mysql://localhost:3306/studentportal";
    private static final String JDBC_USER = "root";
    private static final String JDBC_PASSWORD = "password";
    static {
        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
        } catch (ClassNotFoundException e) {
            e.printStackTrace();
        }
    }
    public static Connection getConnection() throws SQLException {
        return DriverManager.getConnection(JDBC_URL, JDBC_USER, JDBC_PASSWORD);
    }
    public static void closeConnection(Connection conn) {
        if (conn != null) {
            try {
                conn.close();
            } catch (SQLException e) {
                e.printStackTrace();
            }
```

```
        }
    }
}
```

create model classes:

```
// com.studentportal.model.Student.java
package com.studentportal.model;
public class Student {
    private int studentId;
    private String name;
    private String className;
    private char section;
    // Constructors
    public Student() {}
    public Student(int studentId, String name, String className, char section) {
        this.studentId = studentId;
        this.name = name;
        this.className = className;
        this.section = section;
    }
    // Getters and Setters
    public int getStudentId() {
        return studentId;
    }
    public void setStudentId(int studentId) {
        this.studentId = studentId;
    }

    public String getName() {
        return name;
    }
    public void setName(String name) {
        this.name = name;
    }
```

```
    public String getClassName() {
        return className;
    }
    public void setClassName(String className) {
        this.className = className;
    }
    public char getSection() {
        return section;
    }
    public void setSection(char section) {
        this.section = section;
    }
}
// com.studentportal.model.Attendance.java
package com.studentportal.model;
import java.util.Date;
public class Attendance {
    private int id;
    private int studentId;
    private Date date;
    private String status;
    private String remarks;
    // Constructors
    public Attendance() {}

    public Attendance(int id, int studentId, Date date, String status, String remarks) {
        this.id = id;
        this.studentId = studentId;
        this.date = date;
        this.status = status;
        this.remarks = remarks;
    }
    // Getters and Setters
```

```
    public int getId() {
        return id;
    }
    public void setId(int id) {
        this.id = id;
    }
    public int getStudentId() {
        return studentId;
    }
    public void setStudentId(int studentId) {
        this.studentId = studentId;
    }
    public Date getDate() {
        return date;
    }
    public void setDate(Date date) {
        this.date = date;
    }
    public String getStatus() {
        return status;
    }
    public void setStatus(String status) {
        this.status = status;
    }
    public String getRemarks() {
        return remarks;
    }
    public void setRemarks(String remarks) {
        this.remarks = remarks;
    }
}
```

create DAO (Data Access Object) classes:

```
// com.studentportal.dao.StudentDAO.java
```

```
package com.studentportal.dao;

import java.sql.Connection;

import java.sql.PreparedStatement;

import java.sql.ResultSet;

import java.sql.SQLException;

import java.util.ArrayList;

import java.util.List;

import com.studentportal.model.Student;

import com.studentportal.util.DBUtil;

public class StudentDAO {

    public List<Student> getAllStudents() throws SQLException {

        List<Student> students = new ArrayList<>();

        Connection conn = null;

        try {

            conn = DBUtil.getConnection();

            PreparedStatement pstmt = conn.prepareStatement("SELECT * FROM students ORDER BY name");

            ResultSet rs = pstmt.executeQuery();

            while (rs.next()) {

                Student student = new Student();

                student.setStudentId(rs.getInt("student_id"));

                student.setName(rs.getString("name"));

                student.setClassName(rs.getString("class"));

                student.setSection(rs.getString("section").charAt(0));

                students.add(student);

            }

            rs.close();

            pstmt.close();

        } finally {

            DBUtil.closeConnection(conn);

        }

        return students;

    }

    public Student getStudentById(int studentId) throws SQLException {
```

```
    Student student = null;
    Connection conn = null;
    try {
        conn = DBUtil.getConnection();
        PreparedStatement pstmt = conn.prepareStatement("SELECT * FROM students WHERE student_id = ?");
        pstmt.setInt(1, studentId);
        ResultSet rs = pstmt.executeQuery();
        if (rs.next()) {
            student = new Student();
            student.setStudentId(rs.getInt("student_id"));
            student.setName(rs.getString("name"));
            student.setClassName(rs.getString("class"));
            student.setSection(rs.getString("section").charAt(0));
        }
        rs.close();
        pstmt.close();
    } finally {
        DBUtil.closeConnection(conn);
    }

    return student;
}
public List<Student> getStudentsByClassAndSection(String className, char section) throws SQLException {
    List<Student> students = new ArrayList<>();
    Connection conn = null;
    try {
        conn = DBUtil.getConnection();
        PreparedStatement pstmt = conn.prepareStatement(
                "SELECT * FROM students WHERE class = ? AND section = ? ORDER BY name");
        pstmt.setString(1, className);
        pstmt.setString(2, String.valueOf(section));
        ResultSet rs = pstmt.executeQuery();
        while (rs.next()) {
```

```
                Student student = new Student();
                student.setStudentId(rs.getInt("student_id"));
                student.setName(rs.getString("name"));
                student.setClassName(rs.getString("class"));
                student.setSection(rs.getString("section").charAt(0));
                students.add(student);
            }
            rs.close();
            pstmt.close();
        } finally {
            DBUtil.closeConnection(conn);
        }
        return students;
    }
}
// com.studentportal.dao.AttendanceDAO.java
package com.studentportal.dao;

import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.ResultSet;
import java.sql.SQLException;
import java.util.ArrayList;
import java.util.Date;
import java.util.List;
import com.studentportal.model.Attendance;
import com.studentportal.util.DBUtil;
public class AttendanceDAO {
    public boolean saveAttendance(Attendance attendance) throws SQLException {
        Connection conn = null;
        boolean success = false;
        try {
            conn = DBUtil.getConnection();
```

```
        // Check if an entry already exists for this student on this date
        PreparedStatement checkStmt = conn.prepareStatement(
                "SELECT id FROM attendance WHERE student_id = ? AND date = ?");
        checkStmt.setInt(1, attendance.getStudentId());
        checkStmt.setDate(2, new java.sql.Date(attendance.getDate().getTime()));
        ResultSet rs = checkStmt.executeQuery();
        if (rs.next()) {
            // Update existing record
            int id = rs.getInt("id");
            PreparedStatement updateStmt = conn.prepareStatement(
                    "UPDATE attendance SET status = ?, remarks = ? WHERE id = ?");
            updateStmt.setString(1, attendance.getStatus());
            updateStmt.setString(2, attendance.getRemarks());
            updateStmt.setInt(3, id);

            success = updateStmt.executeUpdate() > 0;
            updateStmt.close();
        } else {
            // Insert new record
            PreparedStatement insertStmt = conn.prepareStatement(
                    "INSERT INTO attendance (student_id, date, status, remarks) VALUES (?, ?, ?, ?)");
            insertStmt.setInt(1, attendance.getStudentId());
            insertStmt.setDate(2, new java.sql.Date(attendance.getDate().getTime()));
            insertStmt.setString(3, attendance.getStatus());
            insertStmt.setString(4, attendance.getRemarks());
            success = insertStmt.executeUpdate() > 0;
            insertStmt.close();}
        rs.close();
        checkStmt.close();
    } finally {
        DBUtil.closeConnection(conn);
    }
    return success;
```

```
    }

    public List<Attendance> getAttendanceByDate(Date date) throws SQLException {
        List<Attendance> attendanceList = new ArrayList<>();
        Connection conn = null;
        try {
            conn = DBUtil.getConnection();
            PreparedStatement pstmt = conn.prepareStatement(
                    "SELECT * FROM attendance WHERE date = ?");
            pstmt.setDate(1, new java.sql.Date(date.getTime()));
            ResultSet rs = pstmt.executeQuery();
            while (rs.next()) {
                Attendance attendance = new Attendance();
                attendance.setId(rs.getInt("id"));
                attendance.setStudentId(rs.getInt("student_id"));
                attendance.setDate(rs.getDate("date"));
                attendance.setStatus(rs.getString("status"));
                attendance.setRemarks(rs.getString("remarks"));
                attendanceList.add(attendance);
            }
            rs.close();
            pstmt.close();
        } finally {
            DBUtil.closeConnection(conn);
        }
        return attendanceList;
    }
    public List<Attendance> getAttendanceByStudent(int studentId) throws SQLException {
        List<Attendance> attendanceList = new ArrayList<>();
        Connection conn = null;
        try {
            conn = DBUtil.getConnection();
            PreparedStatement pstmt = conn.prepareStatement(
                    "SELECT * FROM attendance WHERE student_id = ? ORDER BY date DESC");
```

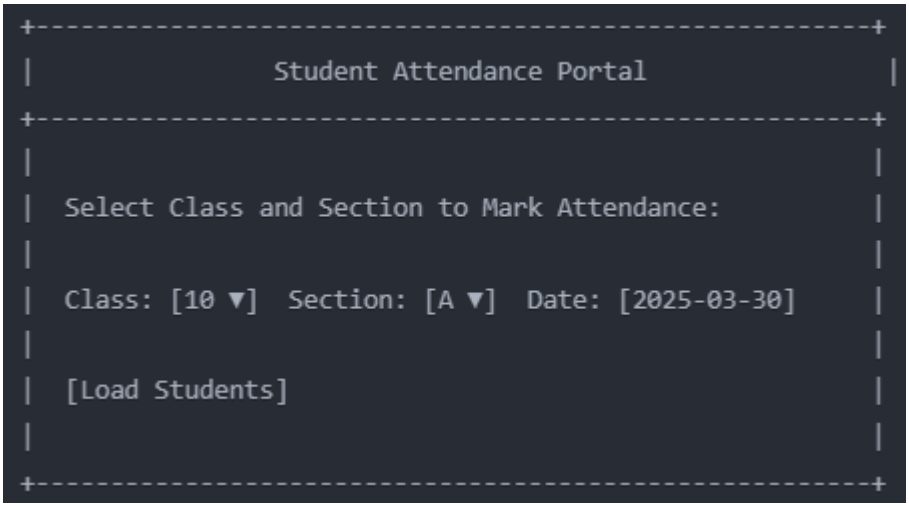
```
            pstmt.setInt(1, studentId);
            ResultSet rs = pstmt.executeQuery();
            while (rs.next()) {
                Attendance attendance = new Attendance();
                attendance.setId(rs.getInt("id"));
                attendance.setStudentId(rs.getInt("student_id"));
                attendance.setDate(rs.getDate("date"));
                attendance.setStatus(rs.getString("status"));
                attendance.setRemarks(rs.getString("remarks"));
                attendanceList.add(attendance);
            }

            rs.close();
            pstmt.close();
        } finally {
            DBUtil.closeConnection(conn);
        }
        return attendanceList;
    }
}
```

create the servlet to handle attendance submission:

```
// com.studentportal.servlet.AttendanceServlet.java
package com.studentportal.servlet;
import java.io.IOException;
import java.sql.SQLException;
import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;
```

```
import com.studentportal.dao.AttendanceDAO;
import com.studentportal.model.Attendance;
@WebServlet("/AttendanceServlet")
public class AttendanceServlet extends HttpServlet {
    private static final long serialVersionUID = 1L;
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        String dateStr = request.getParameter("date");
        String className = request.getParameter("class");
        String section = request.getParameter("section");
        try {
            SimpleDateFormat dateFormat = new SimpleDateFormat("yyyy-MM-dd");
            Date date = dateFormat.parse(dateStr);
            String[] studentIds = request.getParameterValues("studentId");
            String[] statuses = request.getParameterValues("status");
            String[] remarks = request.getParameterValues("remarks");
            AttendanceDAO attendanceDAO = new Attendance
```

Output



```
+-----------------------------------------------------+
|                Student Attendance Portal            |
+-----------------------------------------------------+
|                                                     |
|  Class: 10  Section: A  Date: 2025-03-30            |
|                                                     |
|  +-------------------------------------------------+|
|  | Student ID | Student Name  | Status      | Remarks ||
|  |------------|---------------|-------------|---------||
|  | 1001       | Alex Johnson  | o Present   |         ||
|  |            |               | o Absent    |         ||
|  |            |               | o Late      |         ||
|  |------------|---------------|-------------|---------||
|  | 1002       | Sophia Davis  | o Present   |         ||
|  |            |               | o Absent    |         ||
|  |            |               | o Late      |         ||
|  |------------|---------------|-------------|---------||
|  | 1005       | Noah Thompson | o Present   |         ||
|  |            |               | o Absent    |         ||
|  |            |               | o Late      |         ||
|  +-------------------------------------------------+|
|                                                     |
|  [Save Attendance]                                  |
|                                                     |
+-----------------------------------------------------+
```

```
+-----------------------------------------------------+
|                Student Attendance Portal            |
+-----------------------------------------------------+
|                                                     |
|  ✓ Attendance saved successfully for Class 10-A     |
|    on 2025-03-30.                                   |
|                                                     |
|  [Back to Main]                                     |
|                                                     |
+-----------------------------------------------------+
```

```
+-----------------------------------------------------+
|                Student Attendance Portal            |
+-----------------------------------------------------+
|                                                     |
|  Attendance History for: Alex Johnson (ID: 1001)    |
|                                                     |
|  +-------------------------------------------------+|
|  | Date       | Status  | Remarks                  ||
|  |------------|---------|--------------------------||
|  | 2025-03-30 | Present |                          ||
|  | 2025-03-29 | Present |                          ||
|  | 2025-03-28 | Absent  | Family emergency         ||
|  | 2025-03-27 | Present |                          ||
|  | 2025-03-26 | Late    | Bus delay                ||
|  +-------------------------------------------------+|
|                                                     |
|  [Back to Class View]                               |
|                                                     |
+-----------------------------------------------------+
```

Learning Outcomes:

1. Basic servlet lifecycle and HTML form processing
2. JDBC integration with servlets for database operations
3. JSP implementation for dynamic web content generation
4. MVC architecture application in web development
5. Web application configuration and session management