Java Servlet Practical Lab Sheet

Lab Task 1: Simple Servlet - Display Static Message

```java
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;


@WebServlet(urlPatterns = {"/displayMessage"})
public class DisplayMessageServlet extends HttpServlet {

  protected void doGet(HttpServletRequest request, HttpServletResponse response)
      throws ServletException, IOException {
    response.setContentType("text/html");
     PrintWriter out = response.getWriter();
    out.println("<html><body>");
    out.println("<h1>Welcome to the Java Servlet Lab!</h1>");
    out.println("</body></html>");
  }
```
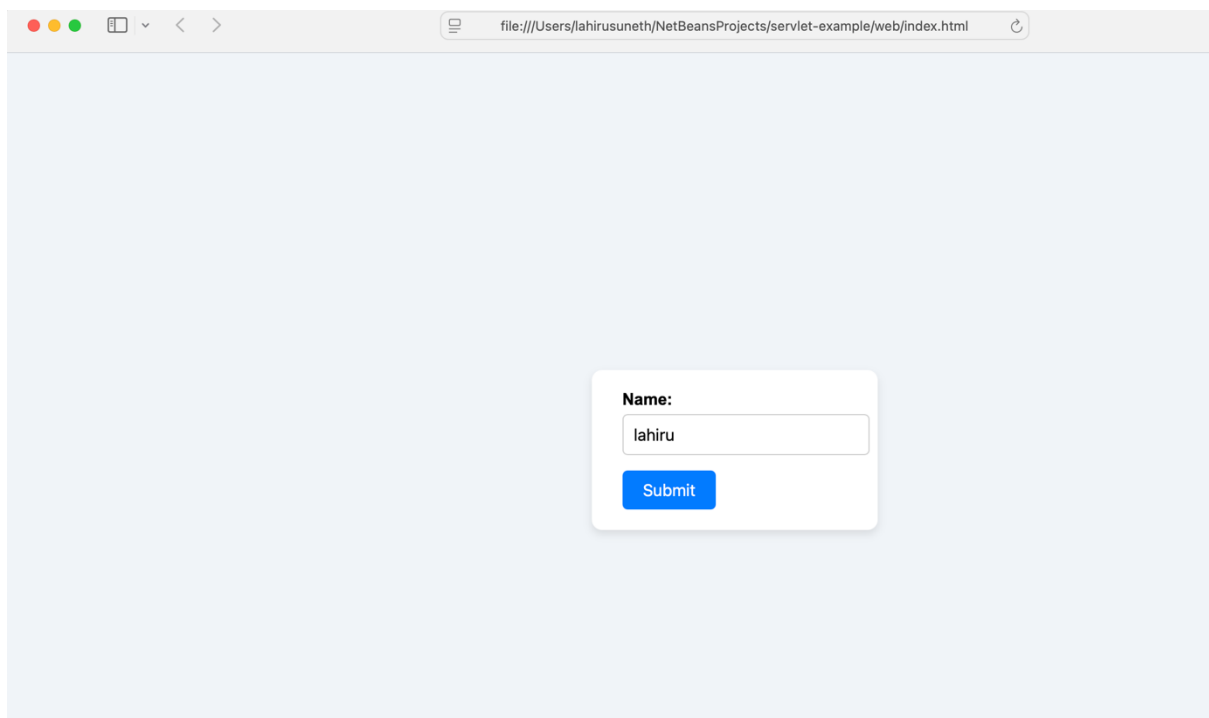
Lab Task 2: Get User Input from Form and Display

HTML Form (index.html):

```html
<!DOCTYPE html>
<html>
<body>
<head><title>Input Form</title></head>
<form action="getUserInput" method="POST">
Name: <input type="text" name="username" required><br>
<input type="submit" value="Submit">
</form>
</body></html>
```

Servlet Code (GetUserInputServlet.java):

```java
package com.example;
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("/getUserInput")
public class GetUserInputServlet extends HttpServlet {
protected void doPost(HttpServletRequest request, HttpServletResponse
response)
throws ServletException, IOException {
String username = request.getParameter("username");
response.setContentType("text/html");
PrintWriter out = response.getWriter();
out.println("<html><body>");
out.println("<h1>Hello, " + username + "!</h1>");
out.println("</body></html>");
}
}
```

Lab Task 3: Get Multiple Inputs, Perform Calculation, and Display Result

HTML Form (calculate.html):

```html
<!DOCTYPE html>
<html>
<head>
  <title>Sum Calculator</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      background-color: #f0f4f8;
      display: flex;
      justify-content: center;
      align-items: center;
      height: 100vh;
      margin: 0;
    }

    form {
      background-color: #ffffff;
      padding: 20px 30px;
      border-radius: 10px;
      box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
    }

    input[type="number"] {
      padding: 8px;
      margin: 10px 0;
      width: 100%;
      border: 1px solid #ccc;
      border-radius: 5px;
    }

    input[type="submit"] {
      background-color: #007bff;
      color: white;
      padding: 10px;
      width: 100%;
      border: none;
      border-radius: 5px;
      cursor: pointer;
      font-size: 16px;
    }

    input[type="submit"]:hover {
      background-color: #0056b3;
    }
```

```html
        label {
            display: block;
            margin-top: 10px;
        }
    </style>
</head>
<body>
    <form action="calculateSum" method="POST">
        <label for="num1">First Number:</label>
        <input type="number" name="num1" id="num1" required>

        <label for="num2">Second Number:</label>
        <input type="number" name="num2" id="num2" required>

        <input type="submit" value="Calculate Sum">
    </form>
</body>
</html>
```

Servlet Code (CalculateSumServlet.java):

```java
        import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;


/**
 *
 * @author User
 */
@WebServlet(urlPatterns = {"/calculateSum"})
public class CalculateSumServlet extends HttpServlet {

@Override
protected void doPost(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {

    // Retrieve and parse the input numbers from the request
    int num1 = Integer.parseInt(request.getParameter("num1"));
    int num2 = Integer.parseInt(request.getParameter("num2"));

    // Calculate the sum
    int sum = num1 + num2;

    // Set response content type
```
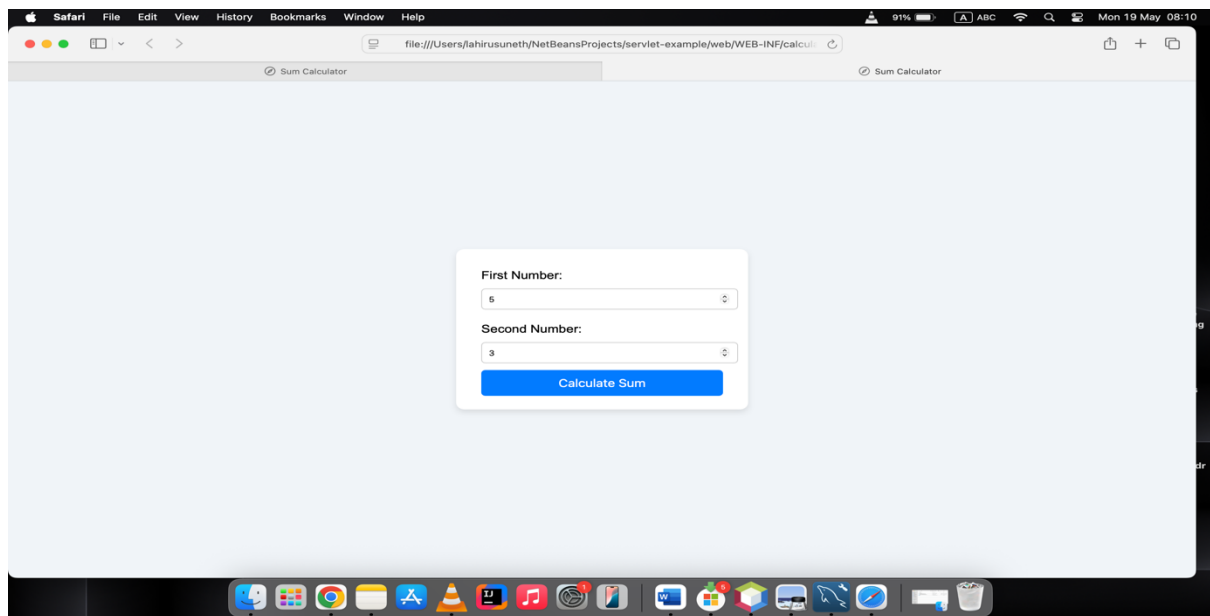
```
response.setContentType("text/html");

    // Generate HTML response
    PrintWriter out = response.getWriter();
    out.println("<!DOCTYPE html>");
    out.println("<html>");
    out.println("<head>");
    out.println("<title>Sum Result</title>");
    out.println("<style>");
    out.println("body { font-family: Arial, sans-serif; background-color: #f0f8ff; text-align:
center; padding-top: 50px; }");
    out.println("h1 { color: #333; }");
    out.println("</style>");
    out.println("</head>");
    out.println("<body>");
    out.println("<h1>The sum of " + num1 + " and " + num2 + " is: <strong>" + sum +
"</strong></h1>");
    out.println("</body>");
    out.println("</html>");
}
}
```

Lab Task 4: Java Servlet with Database CRUD Operations

Database Setup (MySQL example):

CREATE DATABASE stock_management;
USE stock_management;
CREATE TABLE stock (
id INT AUTO_INCREMENT PRIMARY KEY,
product_name VARCHAR(255),
quantity INT
);

HTML Form (stockForm.html):

```
<!DOCTYPE html>
<html>
<head>
  <title>Stock Management</title>
  <style>
    body {
      font-family: Arial, sans-serif;
      background-color: #eef2f7;
      display: flex;
      justify-content: center;
      align-items: center;
      height: 100vh;
      margin: 0;
    }

    form {
      background-color: #ffffff;
      padding: 30px 40px;
      border-radius: 10px;
      box-shadow: 0 4px 10px rgba(0, 0, 0, 0.1);
      width: 300px;
    }

    h2 {
      text-align: center;
      margin-bottom: 20px;
      color: #333333;
    }

    label, input[type="text"], input[type="number"] {
      display: block;
      width: 100%;
      margin-bottom: 15px;
    }

    input[type="text"],
    input[type="number"] {
      padding: 10px;
```

```css
            border: 1px solid #ccc;
            border-radius: 6px;
            font-size: 14px;
        }

        input[type="submit"] {
            width: 100%;
            padding: 10px;
            margin-top: 10px;
            margin-bottom: 5px;
            background-color: #007bff;
            color: white;
            border: none;
            border-radius: 6px;
            cursor: pointer;
            font-size: 16px;
            transition: background-color 0.3s;
        }

        input[type="submit"]:hover {
            background-color: #0056b3;
        }

        input[type="submit"]:nth-child(4) {
            background-color: #28a745;
        }

        input[type="submit"]:nth-child(4):hover {
            background-color: #1e7e34;
        }

        input[type="submit"]:nth-child(5) {
            background-color: #dc3545;
        }

        input[type="submit"]:nth-child(5):hover {
            background-color: #c82333;
        }
    </style>
</head>
<body>
    <form action="stockAction" method="POST">
        <h2>Manage Stock</h2>
        <label for="product_name">Product Name:</label>
        <input type="text" name="product_name" id="product_name" required>

        <label for="quantity">Quantity:</label>
        <input type="number" name="quantity" id="quantity" required>

        <input type="submit" name="action" value="Add Product">
        <input type="submit" name="action" value="Update Product">
        <input type="submit" name="action" value="Delete Product">
    </form>
</body>
</html>
```
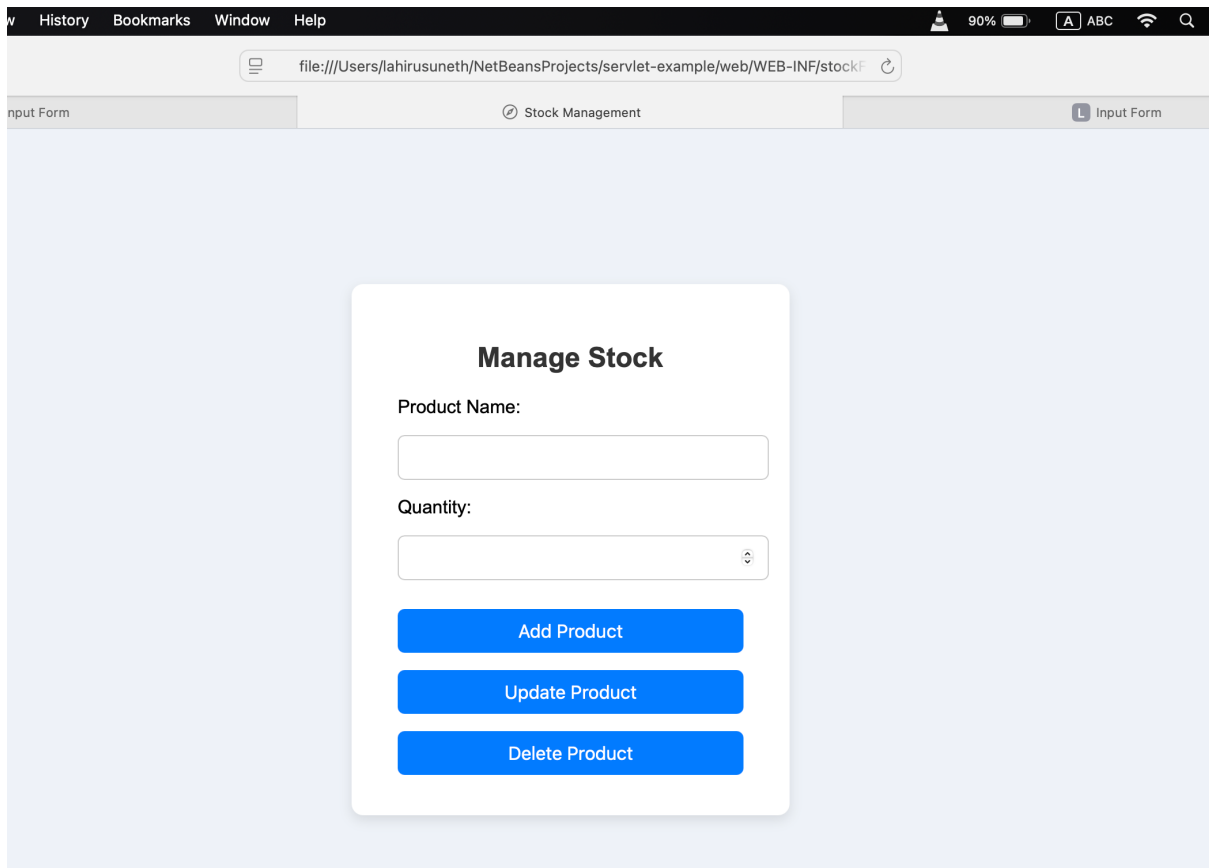
file:///Users/lahirusuneth/NetBeansProjects/servlet-example/web/WEB-INF/stock

Input Form   Stock Management   Input Form

Manage Stock

Product Name:

Quantity:

Add Product

Update Product

Delete Product

Lab Task 5: Display Data from Database on Another Web Page

Servlet Code (DisplayProductsServlet.java):

```
/*
 * Click nbfs://nbhost/SystemFileSystem/Templates/Licenses/license-default.txt to change this license
 * Click nbfs://nbhost/SystemFileSystem/Templates/JSP_Servlet/Servlet.java to edit this template
 */

import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;


import java.sql.*;

/**
 *
 * @author User
 */
```

```java
@WebServlet(urlPatterns = {"/DisplayProducts"})
public class DisplayProductsServlet extends HttpServlet {
 private Connection getConnection() throws SQLException {
     try {
        Class.forName("com.mysql.cj.jdbc.Driver"); // Load MySQL JDBC driver
     } catch (ClassNotFoundException e) {
        throw new SQLException("MySQL JDBC Driver not found.", e);
     }

     String url =
"jdbc:mysql://localhost:3306/stock_management?useSSL=false&allowPublicKeyRetrieval=true&serverTimezone=UTC";
     String username = "root";
     String password = "uthpala"; // Use your MySQL password if set
     return DriverManager.getConnection(url, username, password);
   }

   @Override
   protected void doGet(HttpServletRequest request, HttpServletResponse response)
       throws ServletException, IOException {

     response.setContentType("text/html");
     PrintWriter out = response.getWriter();

     try (Connection conn = getConnection()) {
        Statement stmt = conn.createStatement();
        ResultSet rs = stmt.executeQuery("SELECT * FROM stock");

        out.println("<html><head><title>Stock List</title></head><body>");
        out.println("<h1> Stock List</h1>");
        out.println("<ul>");

        while (rs.next()) {
           out.println("<li>" + rs.getString("product_name") + ": " + rs.getInt("quantity") + "</li>");
        }

        out.println("</ul>");
        out.println("</body></html>");
     } catch (SQLException e) {
        e.printStackTrace();
        out.println("<h1> Database Error: " + e.getMessage() + "</h1>");
     }
   }

}
```