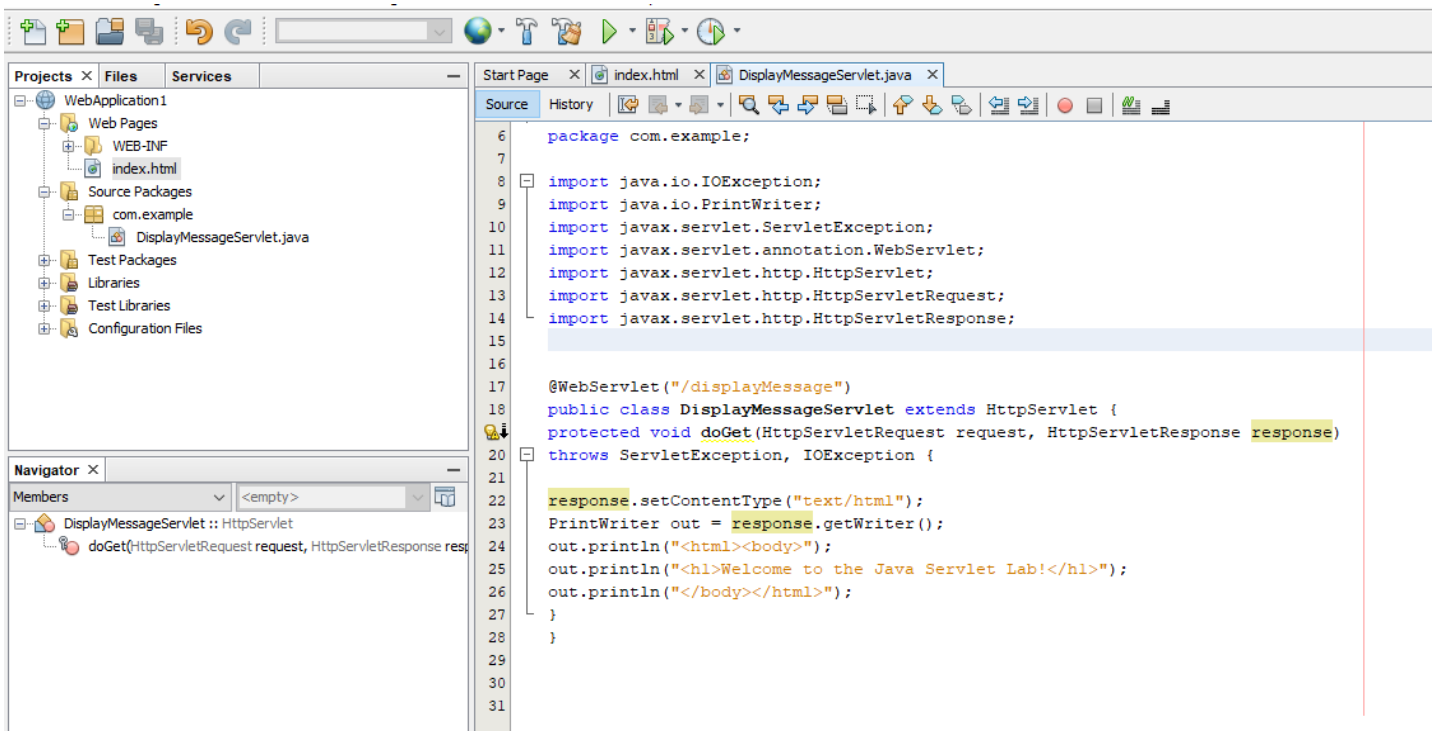
Java Servlet Practical Lab Sheet

- Lab Task 1: Simple Servlet - Display Static Message

  Create a Java Servlet (DisplayMessageServlet) that outputs a static message.

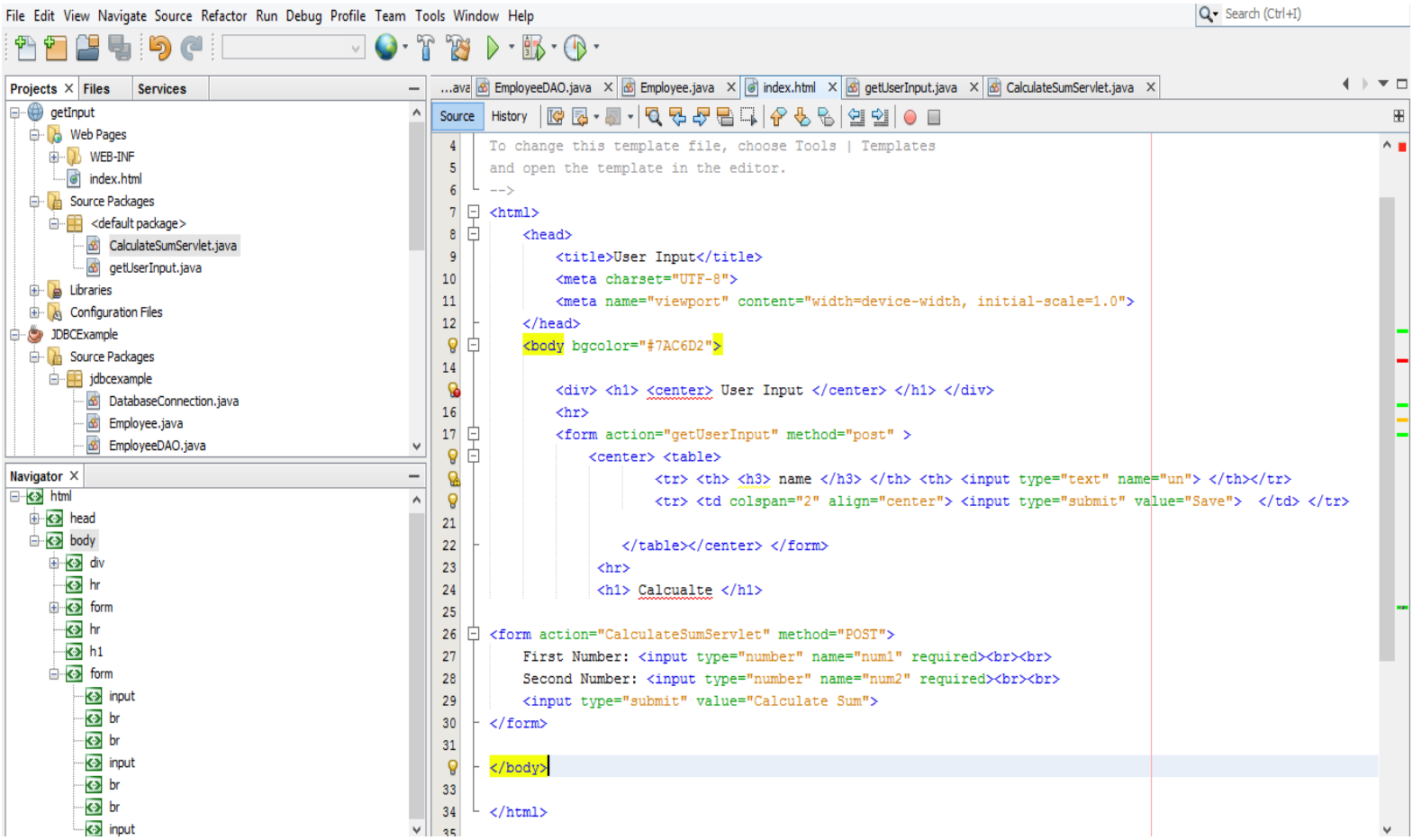


Output

```
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("/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 &
- Lab Task 3: Get Multiple Inputs, Perform Calculation, and Display Result

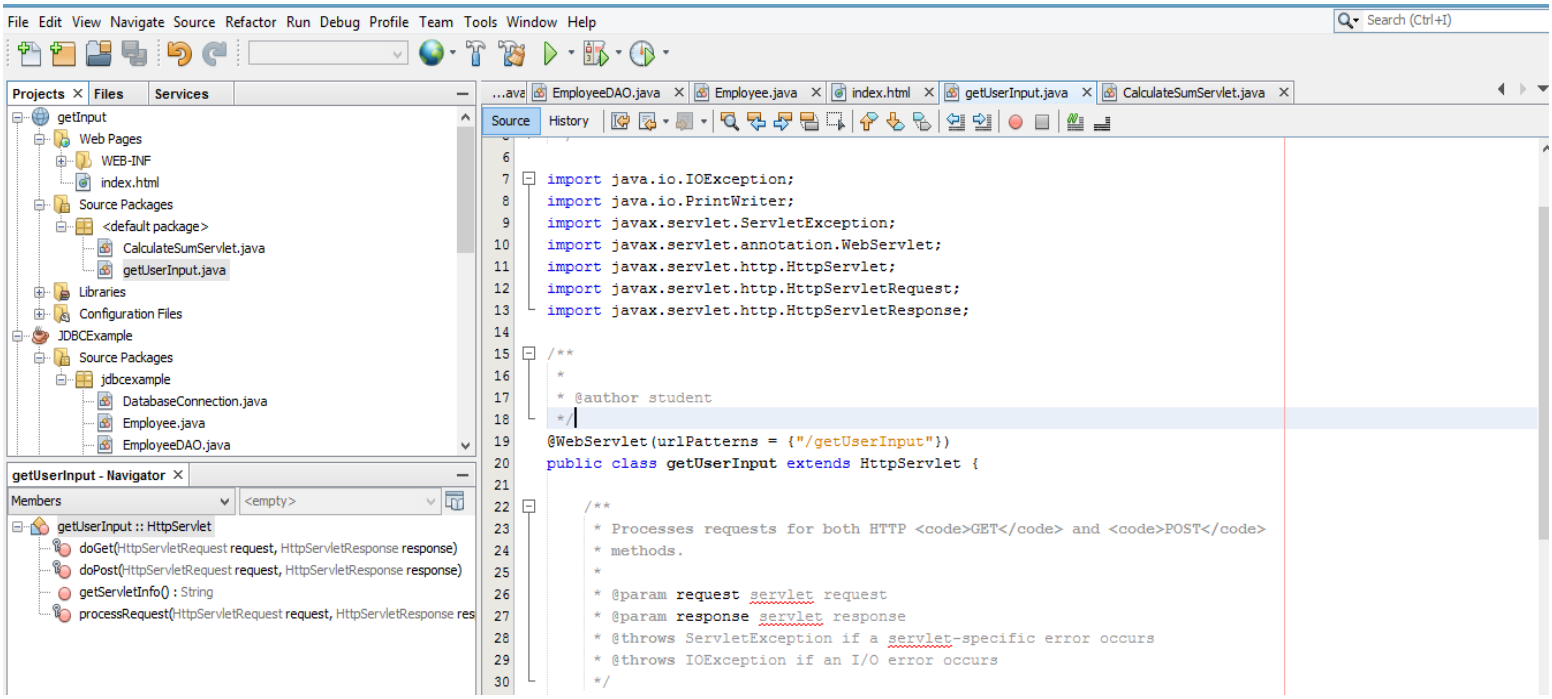
index.html & calculate.html

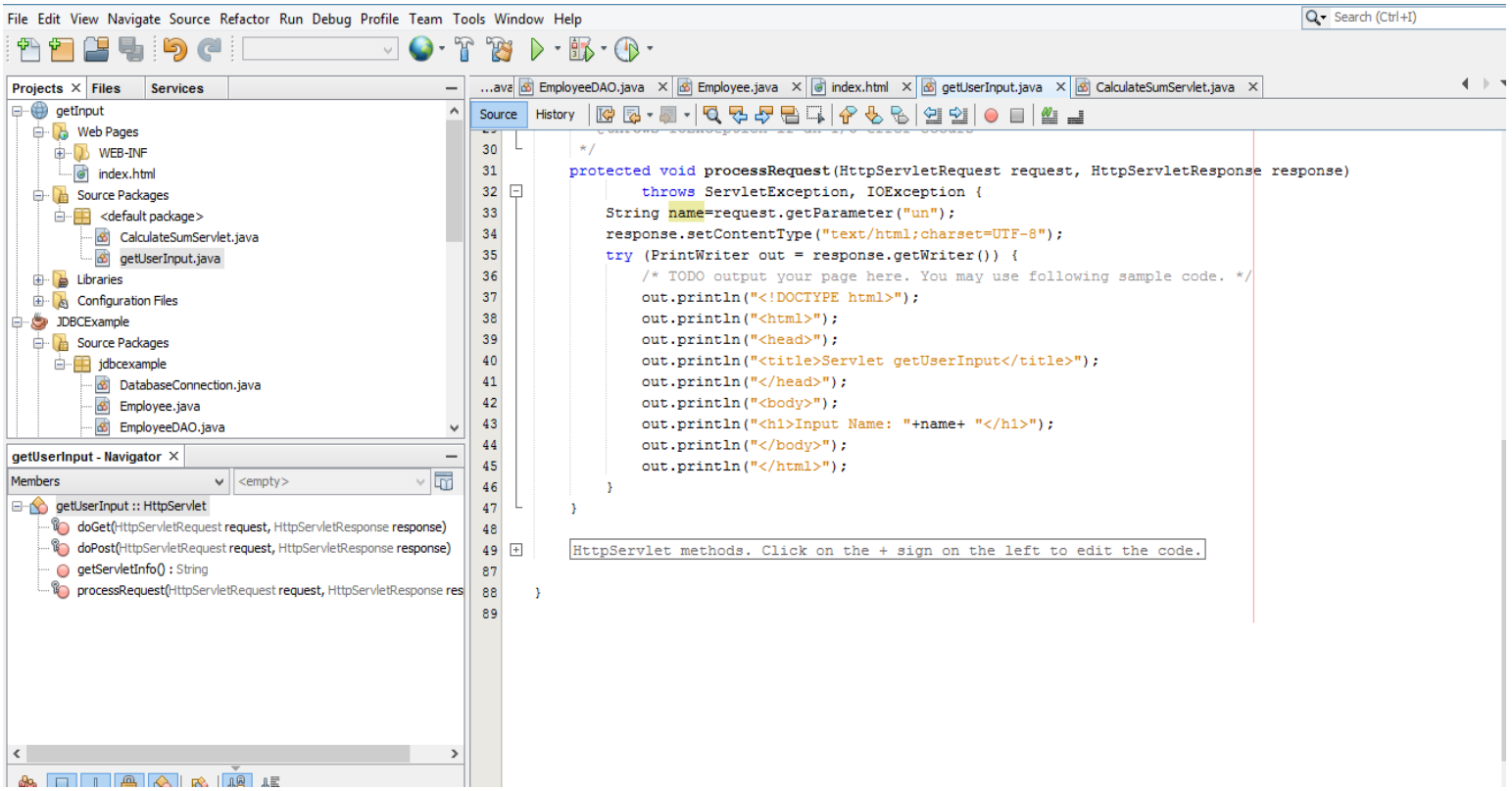


index.html

```
<html>
<head>
<title>User Input</title>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
</head>
<body bgcolor="#ffb000">
<div> <h1> <center> User Input </center> </h1> </div>
<hr>
<form action="getUserInput" method="post">
<center> <table>
<tr>
<th> <h3> name </h3> </th>   <th> <input type="text" name="uname"> </th>
</tr>
<tr>
<td colspan="2" align="center">  <input type="submit" value="Save">  </td>
</tr>
</table>
</center>
</form>
<hr>
</body>
</html>
```

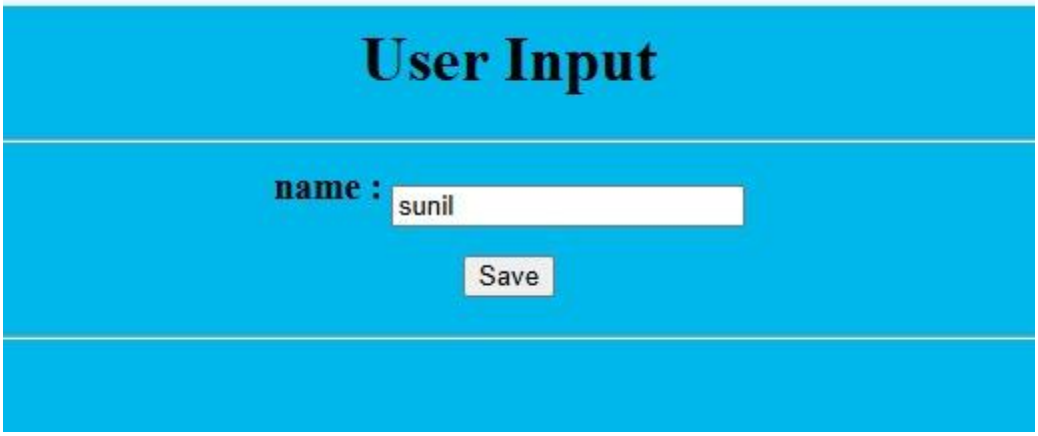
Servlet Code (GetUserInputServlet.java)





```
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(urlPatterns = {"/getUserInput"})
public class getUserInput extends HttpServlet {

    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {

        String name = request.getParameter("uname");
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            /* TODO output your page here. You may use following sample code. */
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet getUserInput</title>");
            out.println("</head>");
            out.println("<body>");
            out.println("<h1> input name: " + name + "</h1>");
            out.println("</body>");
            out.println("</html>");
        }
    }  }
```

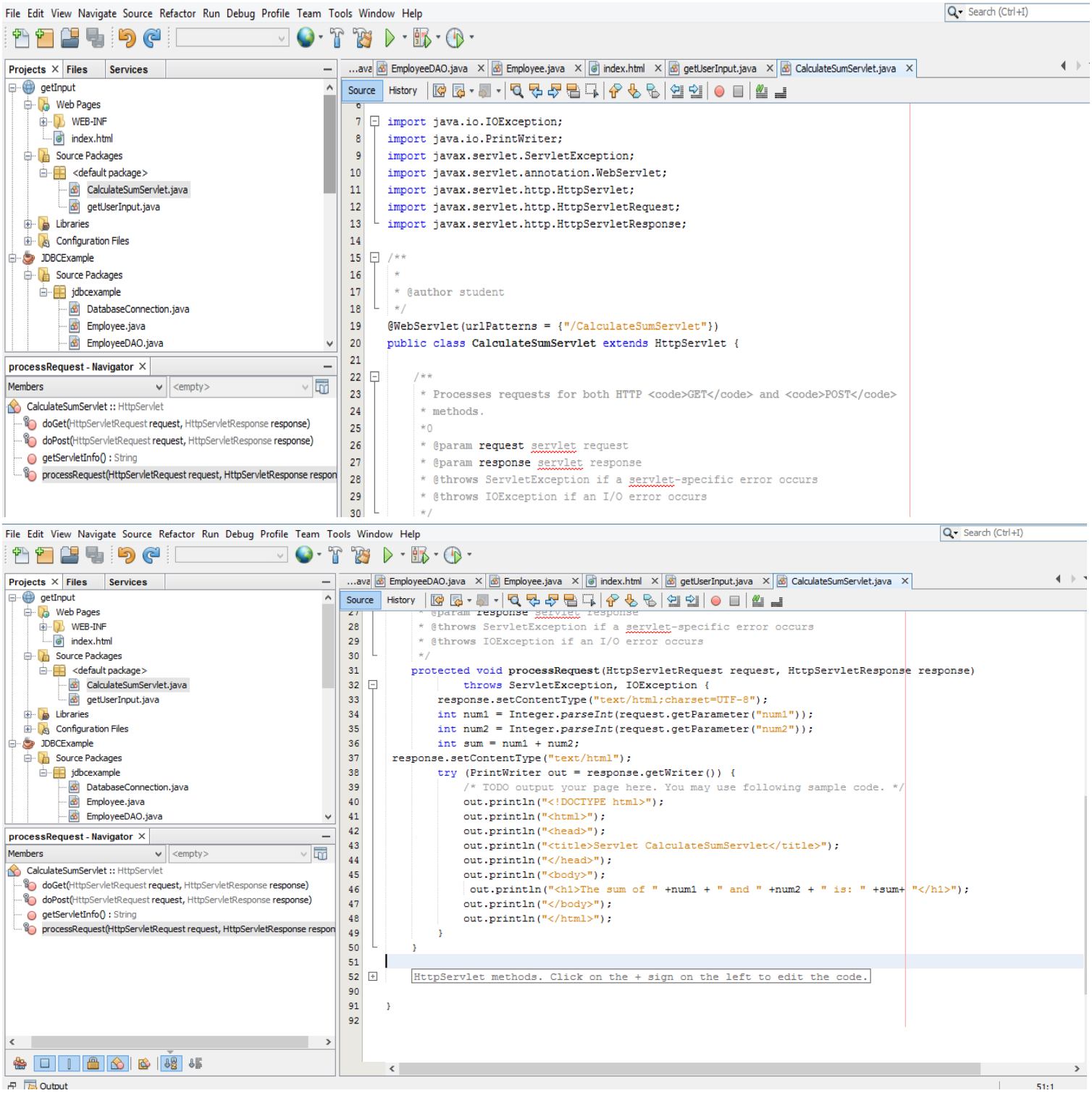
Output



calculate.html

```
<!DOCTYPE html>
<html>
<head><title>Sum Calculator</title></head>
<body>
<form action="calculateSum" method="POST">
First Number: <input type="number" name="num1" required><br>
Second Number: <input type="number" name="num2" required><br>
<input type="submit" value="Calculate Sum">
</form>
</body>
</html>
```

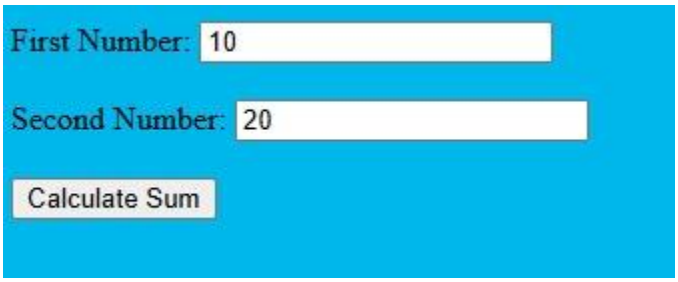
Servlet Code (CalculateSumServlet.java)



```
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;

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

    /**
     * Processes requests for both HTTP <code>GET</code> and <code>POST</code>
     * methods.
     *0
     * @param request servlet request
     * @param response servlet response
     * @throws ServletException if a servlet-specific error occurs
     * @throws IOException if an I/O error occurs
     */
    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html;charset=UTF-8");
        int num1 = Integer.parseInt(request.getParameter("num1"));
        int num2 = Integer.parseInt(request.getParameter("num2"));
        int sum = num1 + num2;
response.setContentType("text/html");
        try (PrintWriter out = response.getWriter()) {
            /* TODO output your page here. You may use following sample code. */
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet CalculateSumServlet</title>");
            out.println("</head>");
            out.println("<body>");
             out.println("<h1>The sum of " +num1 + " and " +num2 + " is: " +sum+ "</h1>");
            out.println("</body>");
            out.println("</html>");
        }
    }

    HttpServlet methods. Click on the + sign on the left to edit the 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(urlPatterns = {"/CalculateSum"})
public class CalculateSum extends HttpServlet {

    protected void processRequest(HttpServletRequest request, HttpServletResponse response)
        throws ServletException, IOException {
        int num1 = Integer.parseInt(request.getParameter("num1"));
        int num2 = Integer.parseInt(request.getParameter("num2"));
        int sum = num1 + num2;
        response.setContentType("text/html;charset=UTF-8");
        try (PrintWriter out = response.getWriter()) {
            /* TODO output your page here. You may use following sample code. */
            out.println("<!DOCTYPE html>");
            out.println("<html>");
            out.println("<head>");
            out.println("<title>Servlet CalculateSum</title>");
            out.println("</head>");
            out.println("<body>");
            out.println("<h3> calculate answer: " + sum + "</h3>");
            out.println("</body>");
            out.println("</html>");
        }
    }
}
```

Output



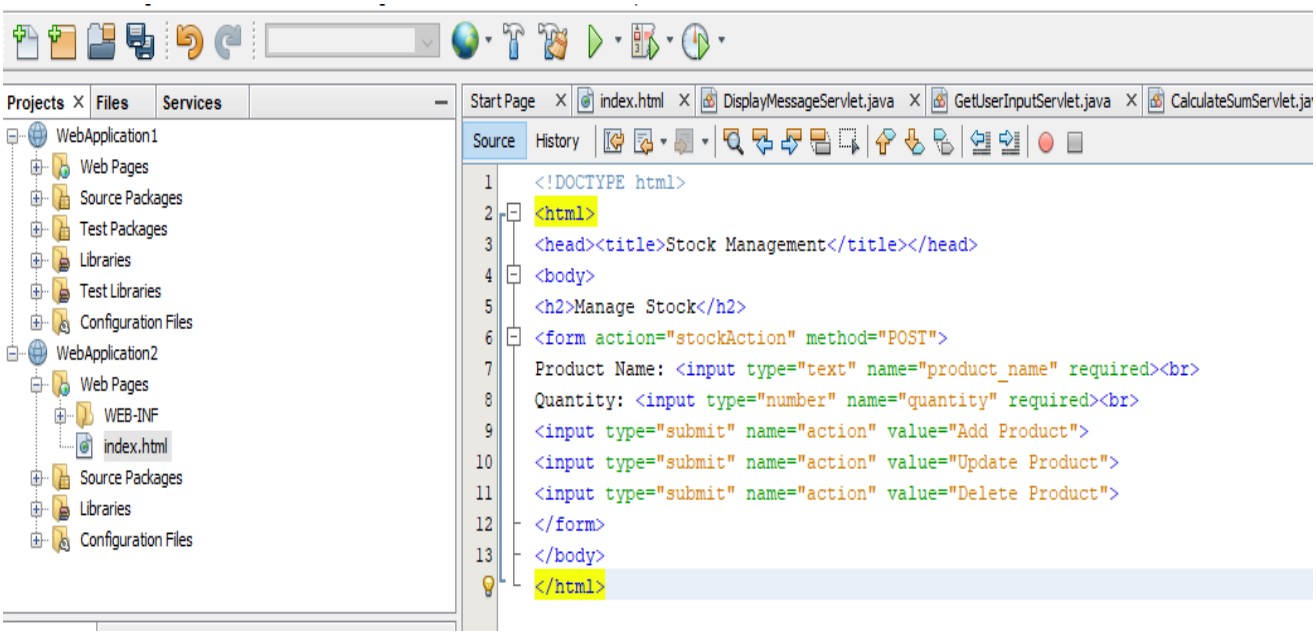
Lab Task 4: Java Servlet with Database CRUD Operations

Database Setup :

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

Table	Action	Rows	Type	Collation	Size	Overhead
stock	Browse Structure Search Insert Empty Drop	0	InnoDB	utf8mb4_general_ci	16.0 KiB	-
1 table	Sum	0	InnoDB	utf8mb4_general_ci	16.0 KiB	0 B

HTML Form (stockForm.html)



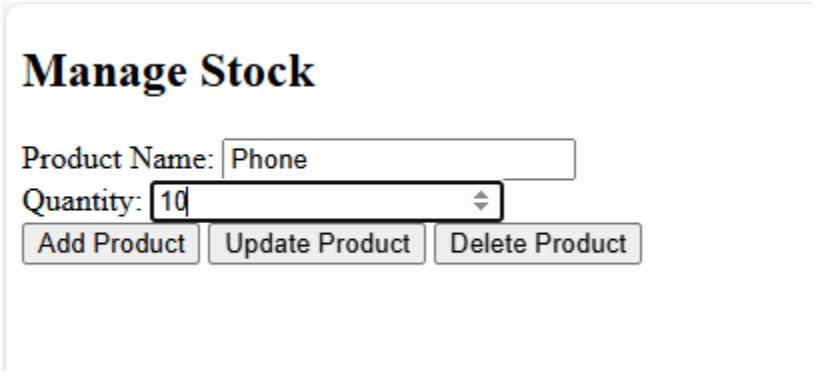
Servlet Code (StockManagementServlet.java):

```
package com.example;

import java.io.*;
import java.sql.*;
import javax.servlet.*;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.*;

@WebServlet("/stockAction")
public class StockManagementServlet extends HttpServlet {

    // Initialize driver when servlet loads
    @Override
    public void init() throws ServletException {
        try {
            Class.forName("com.mysql.cj.jdbc.Driver");
        } catch (ClassNotFoundException e) {
            throw new ServletException("MySQL JDBC Driver not found", e);
        }
    }

    private Connection getConnection() throws SQLException {
        String url =
"jdbc:mysql://localhost:3306/stock_management?useSSL=false&serverTimezone=UTC";
        String username = "root";
        String password = "316830059";
        return DriverManager.getConnection(url, username, password);
    }

    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        response.setContentType("text/html");
        PrintWriter out = response.getWriter();

        String action = request.getParameter("action");
        String productName = request.getParameter("product_name");
        int quantity = Integer.parseInt(request.getParameter("quantity"));

        try (Connection conn = getConnection()) {
            switch (action) {
                case "Add Product":
                    addProduct(conn, productName, quantity, out);
                    break;
```

```
            case "Update Product":
                updateProduct(conn, productName, quantity, out);
                break;
            case "Delete Product":
                deleteProduct(conn, productName, out);
                break;
            default:
                out.println("<h1>Invalid Action</h1>");
        }
    } catch (SQLException e) {
        out.println("<h1>Database Error: " + e.getMessage() + "</h1>");
        e.printStackTrace();
    }

    out.println("<br><a href='stockForm.html'>Back to Form</a>");
}

private void addProduct(Connection conn, String name, int quantity, PrintWriter out)
        throws SQLException {
    String sql = "INSERT INTO stock (product_name, quantity) VALUES (?, ?)";
    try (PreparedStatement stmt = conn.prepareStatement(sql)) {
        stmt.setString(1, name);
        stmt.setInt(2, quantity);
        stmt.executeUpdate();
        out.println("<h1>Product Added Successfully</h1>");
    }
}

private void updateProduct(Connection conn, String name, int quantity, PrintWriter out)
        throws SQLException {
    String sql = "UPDATE stock SET quantity = ? WHERE product_name = ?";
    try (PreparedStatement stmt = conn.prepareStatement(sql)) {
        stmt.setInt(1, quantity);
        stmt.setString(2, name);
        int rows = stmt.executeUpdate();
        if (rows > 0) {
            out.println("<h1>Product Updated Successfully</h1>");
        } else {
            out.println("<h1>Product Not Found</h1>");
        }
    }
}

private void deleteProduct(Connection conn, String name, PrintWriter out)
        throws SQLException {
    String sql = "DELETE FROM stock WHERE product_name = ?";
    try (PreparedStatement stmt = conn.prepareStatement(sql)) {
```

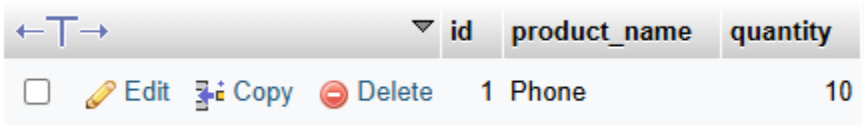
```
            stmt.setString(1, name);
            int rows = stmt.executeUpdate();
            if (rows > 0) {
                out.println("<h1>Product Deleted Successfully</h1>");
            } else {
                out.println("<h1>Product Not Found</h1>");
            }
        }
    } }
```

Output



Product Added Successfully

Back to Form



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

Servlet Code (DisplayProductsServlet.java):

```
package com.example;


import java.io.*;
import java.sql.*;
import javax.servlet.*;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.*;
@WebServlet("/displayProducts")
public class DisplayProductsServlet extends HttpServlet {
   // Reuse your existing connection method
   private Connection getConnection() throws SQLException {
      String url =
"jdbc:mysql://localhost:3306/stock_management?useSSL=false&serverTimezone=UTC";
      String username = "root";
      String password = "316830059";
      return DriverManager.getConnection(url, username, password);
   }
   protected void doGet(HttpServletRequest request, HttpServletResponse response)
         throws ServletException, IOException {
      response.setContentType("text/html");
      PrintWriter out = response.getWriter();
      out.println("<!DOCTYPE html>");
      out.println("<html>");
      out.println("<head>");
      out.println("<title>Stock List</title>");
      out.println("<style>");
      out.println("table { border-collapse: collapse; width: 50%; margin: 20px auto; }");
      out.println("th, td { border: 1px solid #ddd; padding: 8px; text-align: left; }");
      out.println("th { background-color: #f2f2f2; }");
      out.println("</style>");
      out.println("</head>");
      out.println("<body>");
      out.println("<h1 style='text-align: center;'>Current Stock List</h1>");

try (Connection conn = getConnection();
          Statement stmt = conn.createStatement();
          ResultSet rs = stmt.executeQuery("SELECT * FROM stock")) {
         out.println("<table>");
         out.println("<tr><th>ID</th><th>Product Name</th><th>Quantity</th></tr>");

         while (rs.next()) {
            out.println("<tr>");
            out.println("<td>" + rs.getInt("id") + "</td>");
            out.println("<td>" + rs.getString("product_name") + "</td>");
            out.println("<td>" + rs.getInt("quantity") + "</td>");
```

```
            out.println("</tr>");
        }

        out.println("</table>");
    } catch (SQLException e) {
        out.println("<h2 style='color: red; text-align: center;'>Error retrieving stock: "
                + e.getMessage() + "</h2>");
        e.printStackTrace();      }

    out.println("<div style='text-align: center; margin-top: 20px;'>");
    out.println("<a href='stockForm.html'>Back to Stock Management</a>");
    out.println("</div>");
    out.println("</body>");
    out.println("</html>");
  }
}
```

Updated stockForm.html

```
<!DOCTYPE html>
<html>
<head>    <title>Stock Management</title>
<style>    body { font-family: Arial, sans-serif; margin: 20px; }
           form { max-width: 500px; margin: 0 auto; padding: 20px; border: 1px solid #ddd; border-
radius: 5px; }
           input[type="text"], input[type="number"] { width: 100%; padding: 8px; margin: 5px 0 15px; }
            input[type="submit"] { padding: 8px 15px; margin-right: 10px; }
            .view-link { display: block; text-align: center; margin-top: 20px; }
</style>
</head>
<body>   <h2 style="text-align: center;">   Manage Stock   </h2>
<form action="stockAction" method="POST">
          Product Name: <input type="text" name="product_name" required><br>
           Quantity: <input type="number" name="quantity" required><br>
         <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>
<div class="view-link">
<a href="displayProducts"> View All Products   </a>
</div>
</body>
</html>
```

Output

Current Stock List

ID	Product Name	Quantity
1	Phone	10
2	Smart Phone	15

Back to Stock Management

Database

	id	product_name	quantity
Edit Copy Delete	1	Phone	10
Edit Copy Delete	2	Smart Phone	15