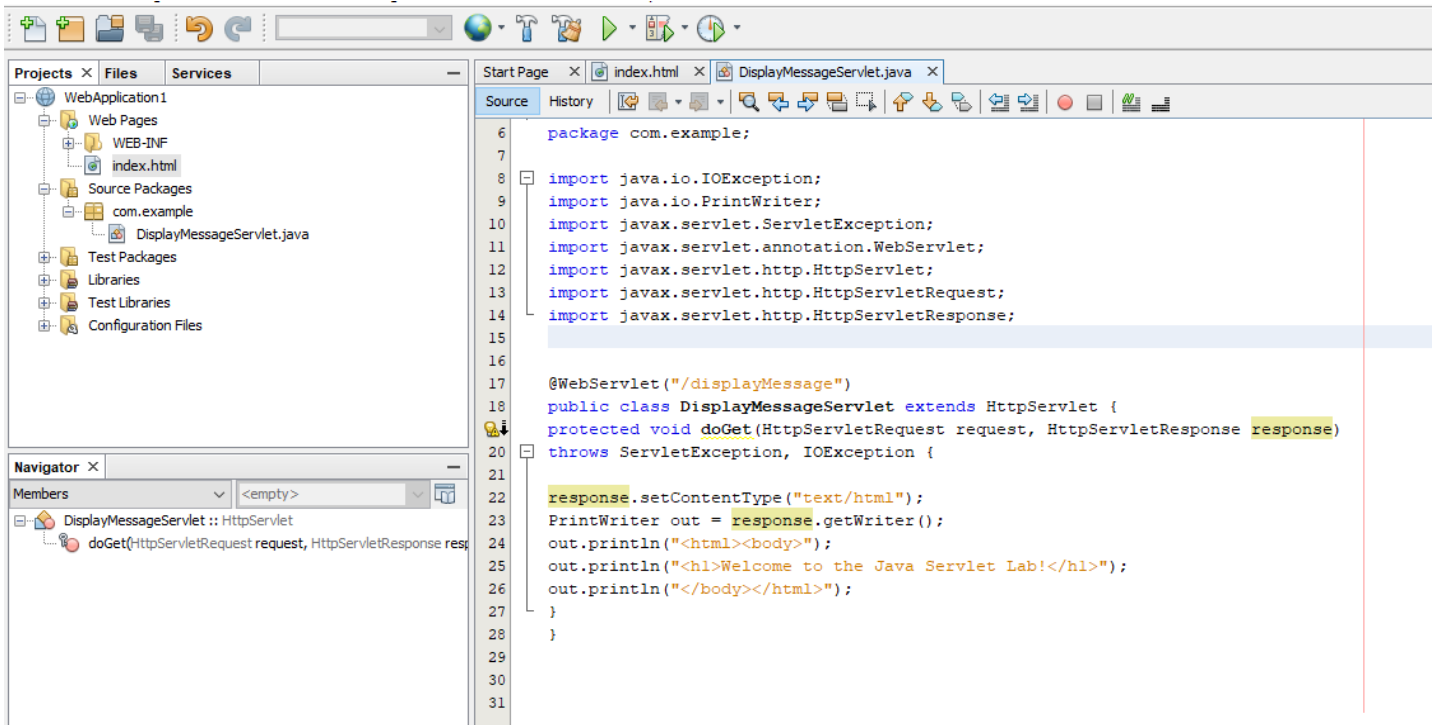


## Java Servlet Practical Lab Sheet

- Lab Task 1: Simple Servlet - Display Static Message

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



The screenshot shows an IDE with the following components:

- Projects View:** Shows a project named 'WebApplication1' with a 'WEB-INF' directory containing 'index.html' and 'com.example' source package. The 'com.example' package contains 'DisplayMessageServlet.java'.
- Source View:** Displays the code for 'DisplayMessageServlet.java'. The code is as follows:

```
6 package com.example;
7
8 import java.io.IOException;
9 import java.io.PrintWriter;
10 import javax.servlet.ServletException;
11 import javax.servlet.annotation.WebServlet;
12 import javax.servlet.http.HttpServlet;
13 import javax.servlet.http.HttpServletRequest;
14 import javax.servlet.http.HttpServletResponse;
15
16
17 @WebServlet("/displayMessage")
18 public class DisplayMessageServlet extends HttpServlet {
19     protected void doGet(HttpServletRequest request, HttpServletResponse response)
20         throws ServletException, IOException {
21
22         response.setContentType("text/html");
23         PrintWriter out = response.getWriter();
24         out.println("<html><body>");
25         out.println("<h1>Welcome to the Java Servlet Lab!</h1>");
26         out.println("</body></html>");
27     }
28 }
```
- Navigator View:** Shows the 'DisplayMessageServlet' class and its 'doGet' method.

### Output



```
package com.example;

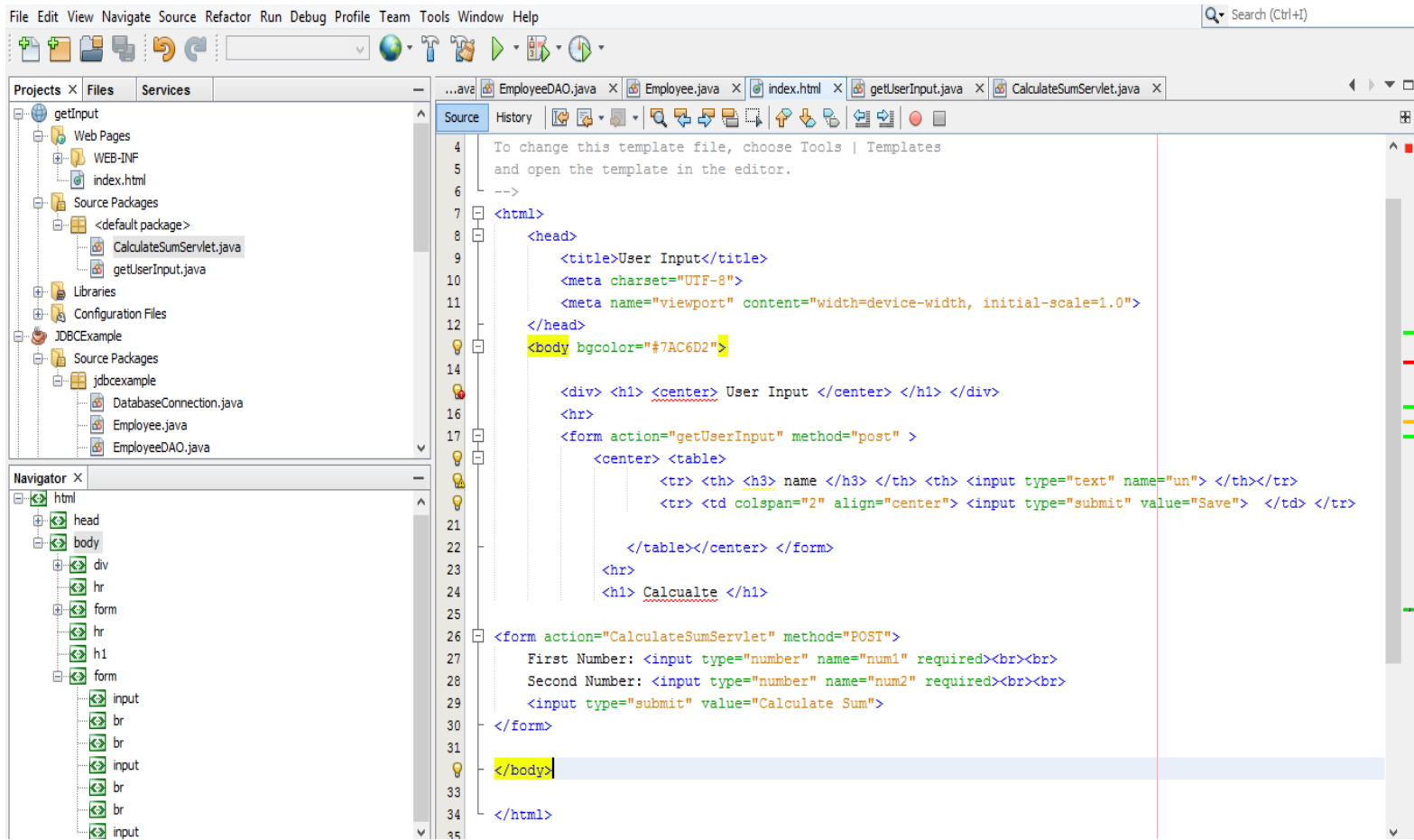
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@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

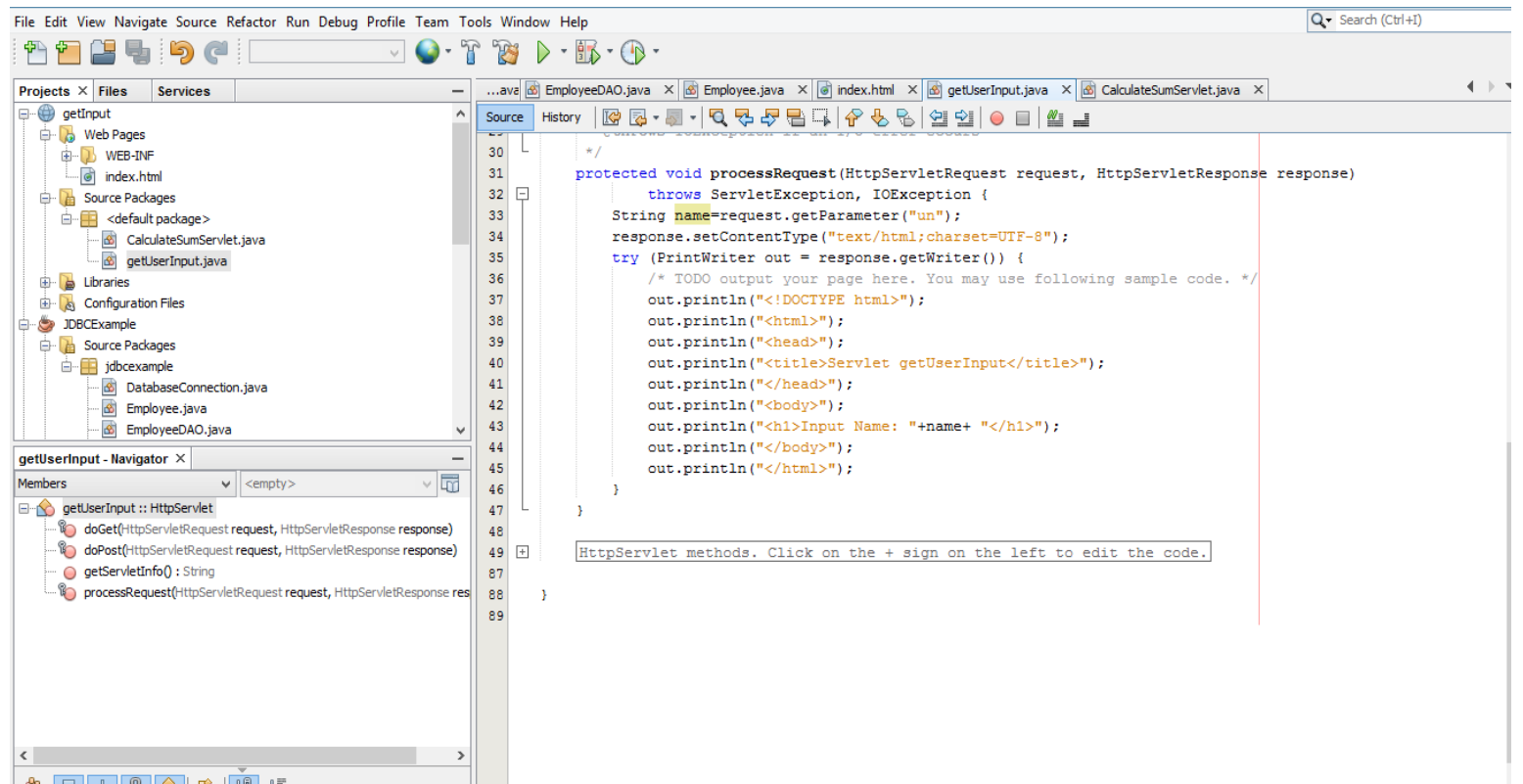
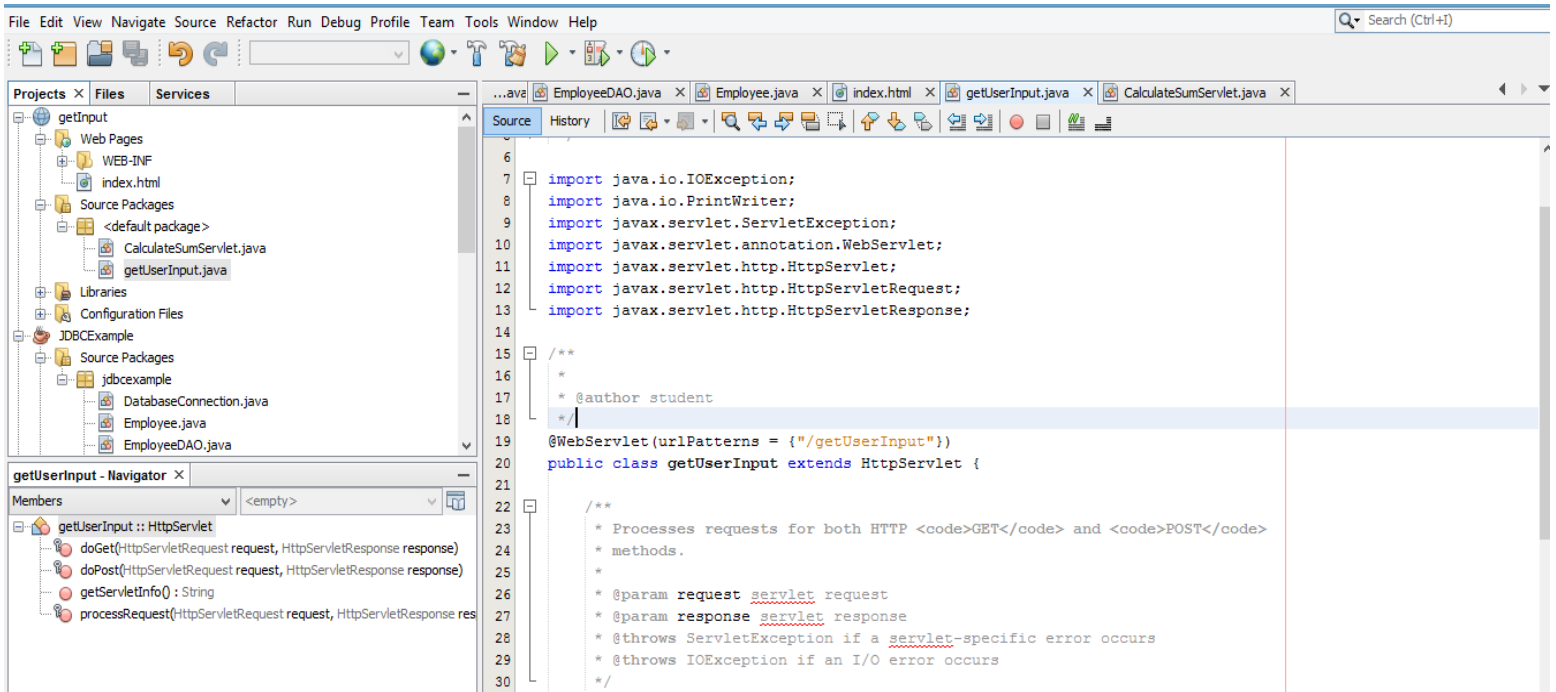
## index.html & calculate.html



## 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

A screenshot of a web application with a blue background. At the top, the text "User Input" is displayed in a large, bold, black serif font. Below this, the text "name :" is followed by a text input field containing the word "sunil". Underneath the input field is a button labeled "Save".

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)

The screenshot displays an IDE with the source code of `CalculateSumServlet.java`. The code is as follows:

```
6
7 import java.io.IOException;
8 import java.io.PrintWriter;
9 import javax.servlet.ServletException;
10 import javax.servlet.annotation.WebServlet;
11 import javax.servlet.http.HttpServlet;
12 import javax.servlet.http.HttpServletRequest;
13 import javax.servlet.http.HttpServletResponse;
14
15 /**
16  *
17  * @author student
18  */
19 @WebServlet(urlPatterns = {"/CalculateSumServlet"})
20 public class CalculateSumServlet extends HttpServlet {
21
22     /**
23      * Processes requests for both HTTP GET and POST
24      * methods.
25      *
26      * @param request servlet request
27      * @param response servlet response
28      * @throws ServletException if a servlet-specific error occurs
29      * @throws IOException if an I/O error occurs
30      */
31     protected void processRequest(HttpServletRequest request, HttpServletResponse response)
32         throws ServletException, IOException {
33         response.setContentType("text/html;charset=UTF-8");
34         int num1 = Integer.parseInt(request.getParameter("num1"));
35         int num2 = Integer.parseInt(request.getParameter("num2"));
36         int sum = num1 + num2;
37         response.setContentType("text/html");
38         try (PrintWriter out = response.getWriter()) {
39             /* TODO output your page here. You may use following sample code. */
40             out.println("<!DOCTYPE html>");
41             out.println("<html>");
42             out.println("<head>");
43             out.println("<title>Servlet CalculateSumServlet</title>");
44             out.println("</head>");
45             out.println("<body>");
46             out.println("<h1>The sum of " + num1 + " and " + num2 + " is: " + sum + "</h1>");
47             out.println("</body>");
48             out.println("</html>");
49         }
50     }
51
52     /*
53      * HttpServlet methods. Click on the + sign on the left to edit the code.
54      */
55 }
56
57 }
```

The IDE interface includes a Project Explorer on the left showing the project structure, a processRequest - Navigator window, and a bottom status bar indicating the file is 51:1.



```

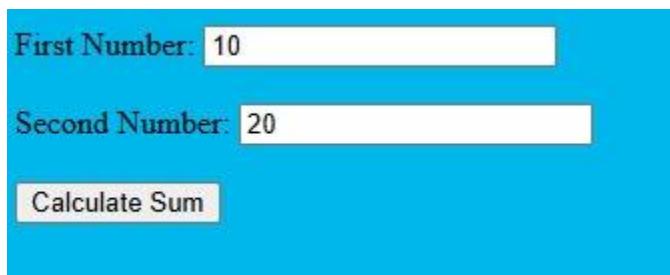
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@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 :

```
1 CREATE DATABASE stock_management;  
2 USE stock_management;  
3 CREATE TABLE stock (  
4 id INT AUTO_INCREMENT PRIMARY KEY,  
5 product_name VARCHAR(255),  
6 quantity INT  
7 );
```

Table	Action	Rows	Type	Collation	Size	Overhead
<input type="checkbox"/> 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)

The screenshot shows an IDE with a project explorer on the left and a code editor on the right. The project explorer shows a project named 'WebApplication1' with a 'Web Pages' folder containing 'index.html'. The code editor displays the HTML code for 'index.html'.

```
1 <!DOCTYPE html>  
2 <html>  
3 <head><title>Stock Management</title></head>  
4 <body>  
5 <h2>Manage Stock</h2>  
6 <form action="stockAction" method="POST">  
7 Product Name: <input type="text" name="product_name" required><br>  
8 Quantity: <input type="number" name="quantity" required><br>  
9 <input type="submit" name="action" value="Add Product">  
10 <input type="submit" name="action" value="Update Product">  
11 <input type="submit" name="action" value="Delete Product">  
12 </form>  
13 </body>  
14 </html>
```



```

        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

## Manage Stock

Product Name:

Quantity:

← ↻ ⓘ localhost:8080/WebApplication2/stockAction

## Product Added Successfully

[Back to Form](#)

	id	product_name	quantity
<input type="checkbox"/> <input type="text" value="Edit"/> <input type="text" value="Copy"/> <input type="text" value="Delete"/>	1	Phone	10

## 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

<div><div>←T→</div><div></div></div>				id	product_name	quantity
<input type="checkbox"/>		Edit	 Copy  Delete	1	Phone	10
<input type="checkbox"/>		Edit	 Copy  Delete	2	Smart Phone	15