

## **Labsheet 4 : Java Servlet**

### **Lab Task 1: Simple Servlet - Display Static Message**

1. Create a Java Servlet (DisplayMessageServlet) that outputs a static message.
2. Configure the servlet using the @WebServlet annotation or the web.xml deployment descriptor.

```
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");

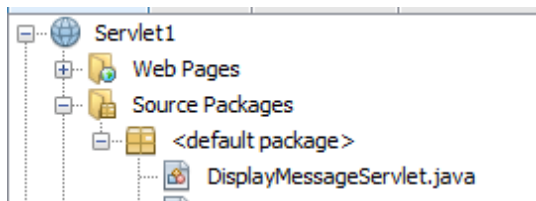
        PrintWriter out = response.getWriter();

        out.println("<html><body>");

        out.println("<h1>Welcome to the Java Servlet Lab!</h1>"); out.println("</body></html>");

    }

}
```



### Deployment Descriptor (web.xml) (if not using annotations):

```
<?xml version="1.0" encoding="UTF-8"?>

<root>

  <web-app xmlns="http://java.sun.com/xml/ns/javaee"
version="3.0">

    <servlet>

      <servlet-name>DisplayMessageServlet</servlet-name> <servlet-
class>com.example.DisplayMessageServlet</servlet-class> </servlet>


    <servlet-mapping>

      <servlet-name>DisplayMessageServlet</servlet-name>

      <url-pattern>/displayMessage</url-pattern>

    </servlet-mapping>

  </web-app>

</root>
```



## Lab Task 2: Get User Input from Form and Display

Create an HTML form to collect the user's name. Create a Servlet (GetUserInputServlet) to handle the form submission and display the user's name.

```
<!DOCTYPE html>
```

```
<html>
```

```
<head><title>Input Form</title></head>
```

```
<body>
```

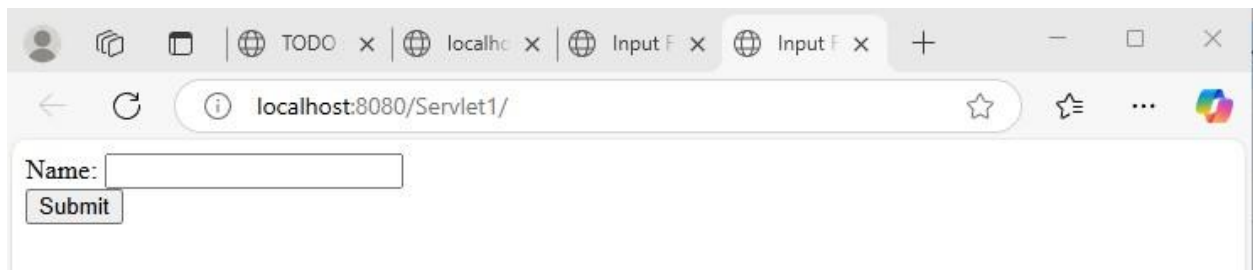
```
<form action="getUserInput" method="POST">
```

```
Name: <input type="text" name="username" required><br> <input type="submit" value="Submit">
```

```
</form>
```

```
</body>
```

```
</html>
```



### Servlet Code (GetUserInputServlet.java):

```
package com.example;

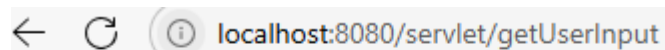
import java.io.IOException;
import java.io.PrintWriter;
import javax.servlet.ServletException;
import javax.servlet.annotation.WebServlet;
import javax.servlet.http.HttpServlet;
import javax.servlet.http.HttpServletRequest;
import javax.servlet.http.HttpServletResponse;

@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>");
    }
}
```

A screenshot of a web browser's address bar. It features a back arrow icon, a circular refresh icon, and an information icon (i) on the left. The text in the address bar is "localhost:8080/servlet/getUserInput".

# Hello, Ishadi!

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

Create an HTML form to take inputs for two numbers. Create a Servlet (CalculateSumServlet) to calculate the sum of the numbers and display the result.

### HTML Form (calculate.html):

```
<!DOCTYPE html>
```

```
<html>
```

```
<head><title>Sum Calculator</title></head>
```

```
<body>
```

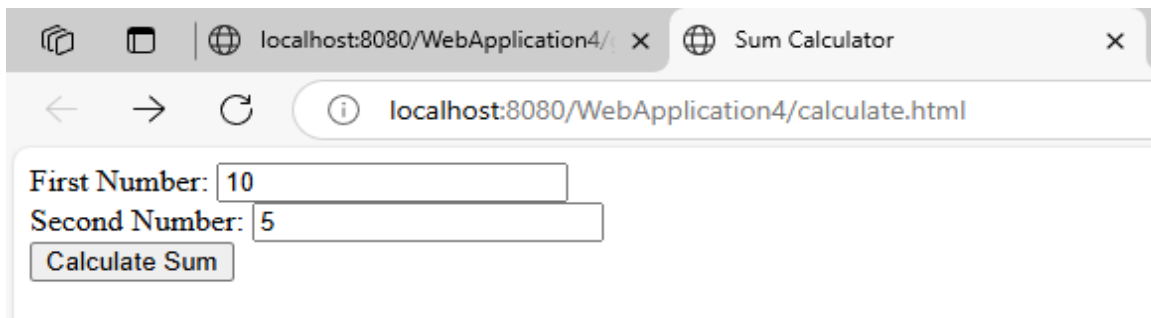
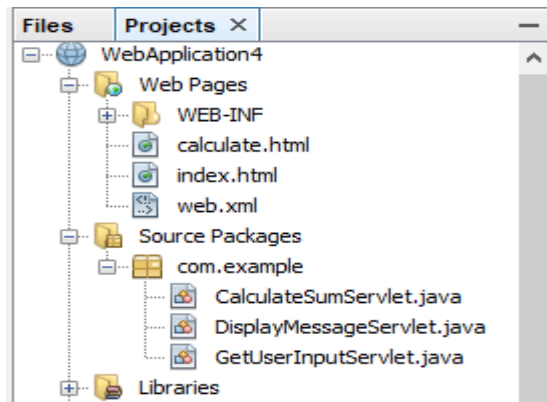
```
<form action="calculateSum" method="POST">
```

```
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):

```
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("/calculateSum")

public class CalculateSumServlet extends HttpServlet {

    protected void doPost(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");

        PrintWriter out = response.getWriter();

        out.println("<html><body>");

        out.println("<h1>The sum of " + num1 + " and " + num2 + " is: " + sum + "</h1>");

        out.println("</body></html>");

    } }
```



## **Lab Task 4: Java Servlet with Database CRUD Operations**

1. **Set up a database** with a table named stock (fields: id, product\_name, quantity).
2. **Create a simple web form** to interact with the database (add, update, delete products).
3. **Create a Servlet** (StockManagementServlet) that handles database operations.

### **Database Setup (MySQL example):**

```
CREATE DATABASE stock_management;
```

```
USE stock_management;
```

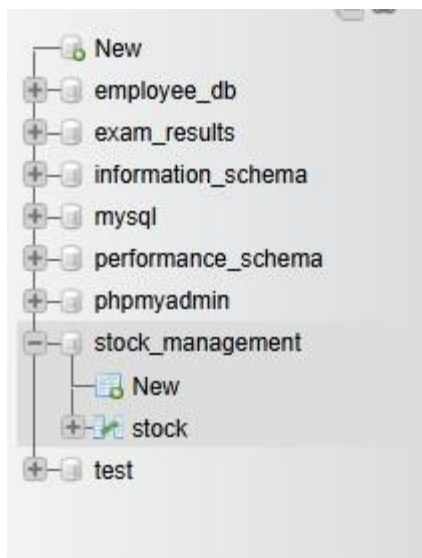
```
CREATE TABLE stock (
```

```
id INT AUTO_INCREMENT PRIMARY KEY,
```

```
product_name VARCHAR(255),
```

```
quantity INT
```

```
);
```



## HTML Form (stockForm.html):

```
<!DOCTYPE html>

<html>

<head><title>Stock Management</title></head>

<body>

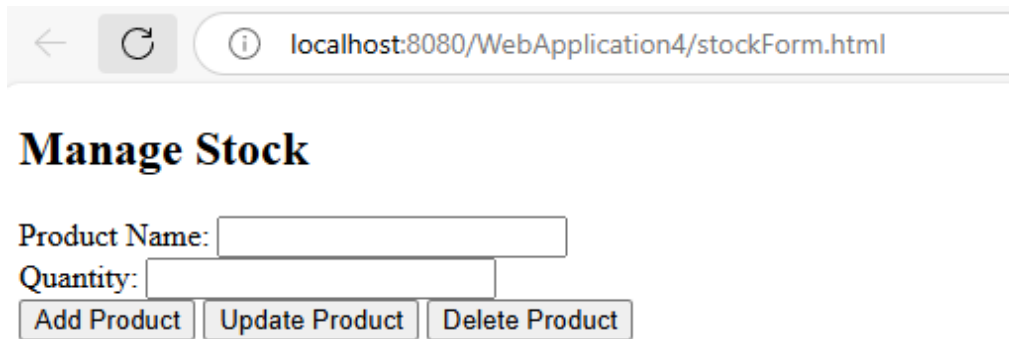
<h2>Manage Stock</h2>

<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>

</body>

</html>
```



The screenshot shows a web browser window with the address bar displaying 'localhost:8080/WebApplication4/stockForm.html'. The page content includes a heading 'Manage Stock' and a form with two input fields: 'Product Name:' and 'Quantity:'. Below these fields are three buttons: 'Add Product', 'Update Product', and 'Delete Product'.



**Servlet Code (StockManagementServlet.java):**

```
package com.example;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.*;
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("/stockAction")

public class StockManagementServlet extends HttpServlet {

    private Connection getConnection() throws SQLException { String url =
    "jdbc:mysql://localhost:3306/stock_management"; String username = "root";

    String password = "root"; // replace with your database password

    return DriverManager.getConnection(url, username, password); }

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

        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":

                    try (PreparedStatement stmt = conn.prepareStatement( "INSERT INTO stock (product_name,
                    quantity) VALUES (?, ?)")) {

                        stmt.setString(1, productName);

                        stmt.setInt(2, quantity);
```

```
stmt.executeUpdate();

response.getWriter().write("<h1>Product Added Successfully</h1>");

}

break;

case "Update Product":

try (PreparedStatement stmt = conn.prepareStatement( "UPDATE stock SET quantity = ?
WHERE product_name = ?")) {

    stmt.setInt(1, quantity);

    stmt.setString(2, productName);

    stmt.executeUpdate();

    response.getWriter().write("<h1>Product Updated Successfully</h1>");

}

break;

case "Delete Product":

try (PreparedStatement stmt = conn.prepareStatement( "DELETE FROM stock WHERE
product_name = ?")) { stmt.setString(1, productName);

stmt.executeUpdate();

    response.getWriter().write("<h1>Product Deleted Successfully</h1>");

}

break;

default:

response.getWriter().write("<h1>Invalid Action</h1>"); }

} catch (SQLException e) {

e.printStackTrace();

response.getWriter().write("<h1>Database Error: " + e.getMessage() + "</h1>");

}

} }
```

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

### Steps:

1. Create a Servlet to fetch and display all products from the database.
2. Create a new HTML page to show the product list.

### Showproduct.html

```
<!DOCTYPE html>

<html>

<head>

    <title>View Products</title>

</head>

<body>

    <h1>Welcome to Product Inventory</h1>

    <p>Click the button below to view all products in stock.</p>

    <form action="displayProducts" method="get">

        <button type="submit">Display Products</button>

    </form>

</body>

</html>
```

### Servlet Code (DisplayProductsServlet.java):

```
package com.example;

import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.ResultSet;
```

```

import java.sql.SQLException;
import java.sql.Statement;

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("/displayProducts")

public class DisplayProductsServlet extends HttpServlet {
    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><body><h1>Stock List</h1>");
            while (rs.next()) {
                out.println("<p>" + rs.getString("product_name") + ": " +
                rs.getInt("quantity") + "</p>");
            }
            out.println("</body></html>");
        } catch (SQLException e) {
            e.printStackTrace();
        }
    }
}

```

```
out.println("<h1>Database Error</h1>");
}
}

private Connection getConnection() throws SQLException {
    // Update with your DB details
    String url = "jdbc:mysql://localhost:3306/stock_management";
    String user = "your_username";
    String password = "your_password";
    return DriverManager.getConnection(url, user, password);
}
}
```

