

## Lab Sheet 04 - Java Servlet

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

Steps:

- I. Create a Java Servlet (DisplayMessageServlet)
- II. Configure the servlet using the `@WebServlet` annotation or the web.xml deployment descriptor.

#### Code: DisplayMessageServlet.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("/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>");
    }
}
```

### Code: web.xml

```
<?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>

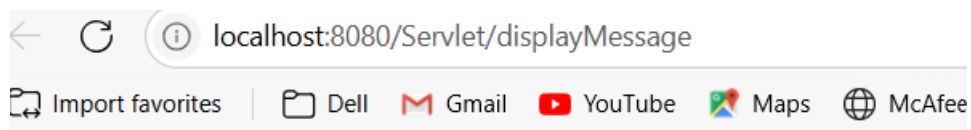
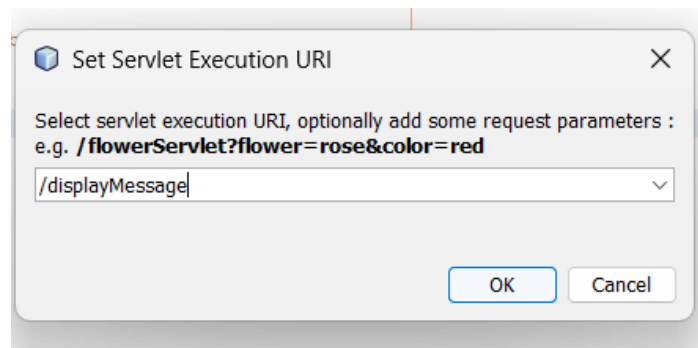
        <url-pattern>/displayMessage</url-pattern>

      </servlet-mapping>

    </web-app>

  </root>
```

Output:



# Welcome to the Java Servlet Lab!

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

### Steps:

- I. Create an HTML form
- II. Create a Servlet (GetUserInputServlet)

### HTML Form (index.html):

```
<!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;

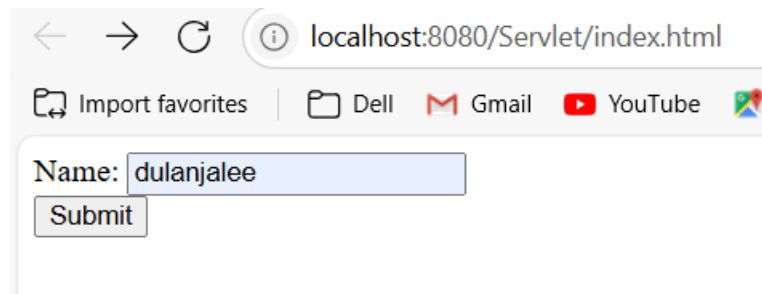
import javax.servlet.http.HttpServletRequest;

import javax.servlet.http.HttpServletResponse;

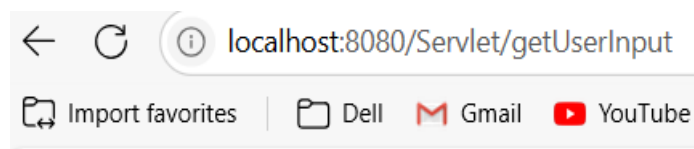
@WebServlet("/getUserInput")
```

```
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>");  
    }  
}
```

### Output:



A screenshot of a web browser window. The address bar shows 'localhost:8080/Servlet/index.html'. Below the address bar, there are links for 'Import favorites', 'Dell', 'Gmail', 'YouTube', and a map icon. The main content area displays a form with the label 'Name:' followed by a text input field containing the name 'dulanjalee'. Below the input field is a 'Submit' button.



A screenshot of a web browser window. The address bar shows 'localhost:8080/Servlet/getUserInput'. Below the address bar, there are links for 'Import favorites', 'Dell', 'Gmail', and 'YouTube'.

# Hello, dulanjalee!

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

#### Steps:

- I. Create an HTML form to take inputs for two numbers.
- II. 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):

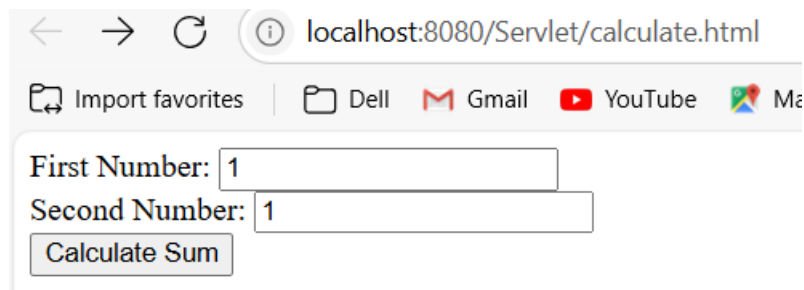
```
package com.example;

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;

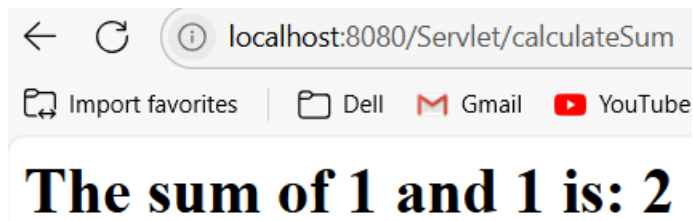
@WebServlet("/calculateSum")
public class CalculateSumServlet extends HttpServlet {
    protected void doPost(HttpServletRequest request, HttpServletResponse
    response)
        throws ServletException, IOException {
        int num1 = Integer.parseInt(request.getParameter("num1")); int num2 =
        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>");
}
}
```

### Output:



A screenshot of a web browser window. The address bar shows "localhost:8080/Servlet/calculate.html". Below the address bar, there are links for "Import favorites", "Dell", "Gmail", "YouTube", and "Ma". The main content area contains a form with two input fields. The first field is labeled "First Number:" and contains the value "1". The second field is labeled "Second Number:" and also contains the value "1". Below these fields is a button labeled "Calculate Sum".



A screenshot of a web browser window. The address bar shows "localhost:8080/Servlet/calculateSum". Below the address bar, there are links for "Import favorites", "Dell", "Gmail", and "YouTube". The main content area displays the text "The sum of 1 and 1 is: 2" in a large, bold, black serif font.

## Task 4: Java Servlet with Database CRUD Operations

### Steps:

- I. Set up a database with a table named stock
- II. Create a simple web form to interact with the database
- III. Create a Servlet (StockManagementServlet)

### 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>
```

### **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:3308/stock_management";
        String username = "root";
        String password = ""; // 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();

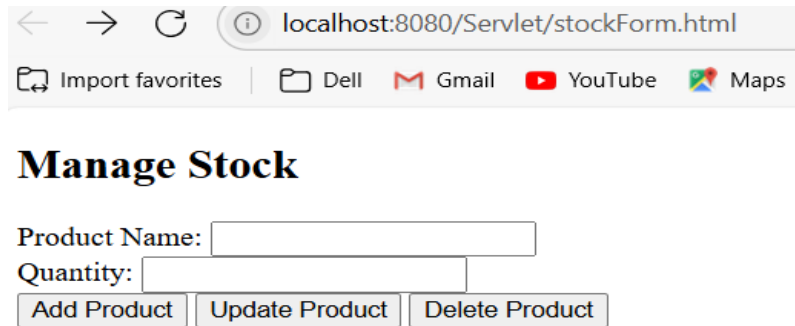
response.getWriter().write("<h1>Database Error: " + e.getMessage() + "</h1>");

}

}

}
```

Output:



The screenshot shows a web browser window with the address bar displaying "localhost:8080/Servlet/stockForm.html". Below the address bar, there are links for "Import favorites", "Dell", "Gmail", "YouTube", and "Maps". The main content of the page is titled "Manage Stock" in a bold, black font. Below the title, there are two input fields: "Product Name:" and "Quantity:". Below these fields, there are three buttons: "Add Product", "Update Product", and "Delete Product".

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

### **Steps:**

- I. Create a Servlet
- II. Create a new HTML page

### **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:3308/stock_management";
    String user = "root ";
    String password = " ";
    return DriverManager.getConnection(url, user, password);
}
}

```

### 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">

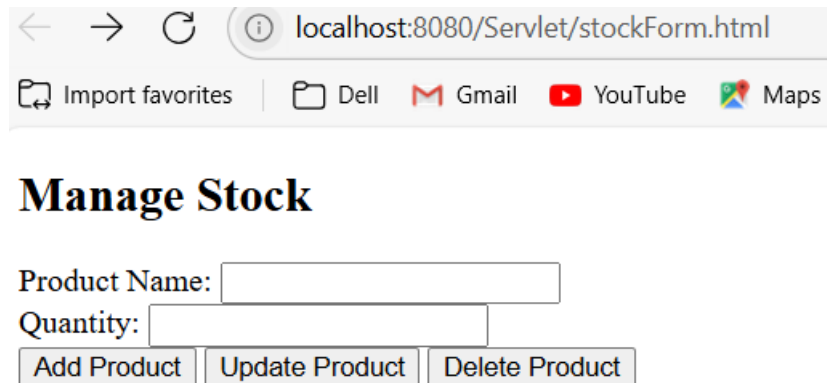
    <button type="submit">Display Products</button>

  </form>

</body>

</html>
```

### Output:



← → ↻ ⓘ localhost:8080/Servlet/stockForm.html

🔖 Import favorites | 📁 Dell 📧 Gmail 📺 YouTube 📍 Maps

## Manage Stock

Product Name:

Quantity: