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.

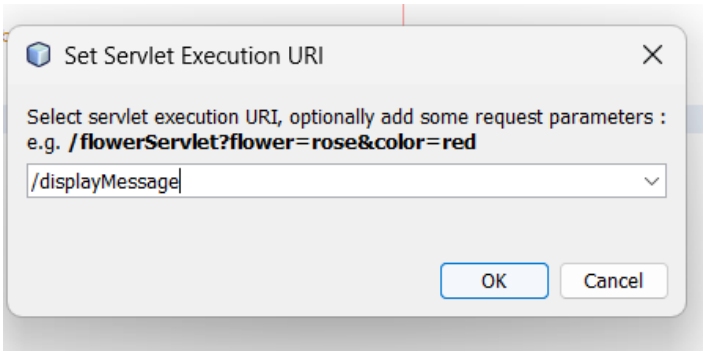
Code: DisplayMessageServlet.java

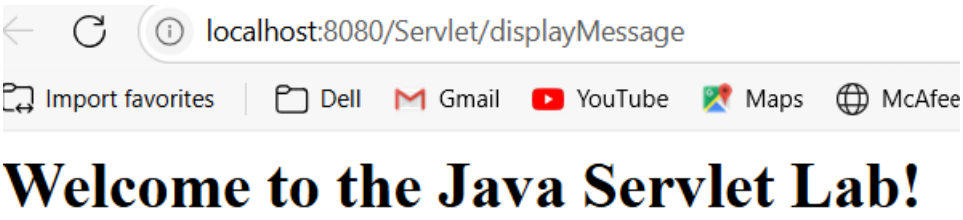
```
import java.io.IOException;

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:





Task 2: Get User Input from Form and Display

Steps:

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

HTML Form (index.html):

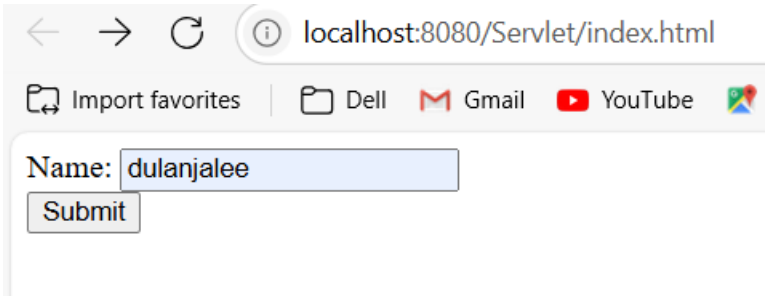
```
<!DOCTYPE html>
<html>
<head><title>Input Form</title></head>
<body>
 <form action="getUserInput" method="POST">
 Name: <input type="text" name="username" required><br>  <input type="submit" value="Submit">
 </form>
 </body>
 </html>
```

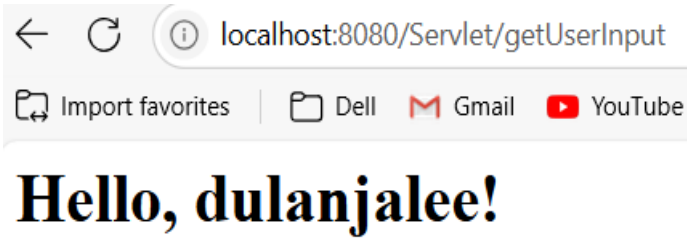
Servlet Code (GetUserInputServlet.java):

```
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:





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):

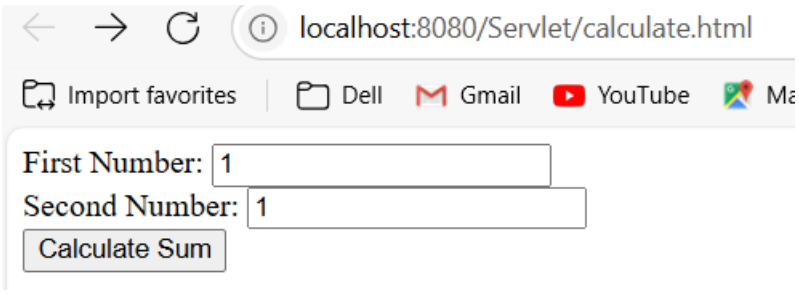
```
<!DOCTYPE html>
<html>
<head><title>Sum Calculator</title></head>
<body>
<form action="calculateSum" method="POST">
First Number: <input type="number" name="num1" required><br> Second Number: <input type="number" name="num2" required><br> <input type="submit" value="Calculate Sum">
</form>
</body>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

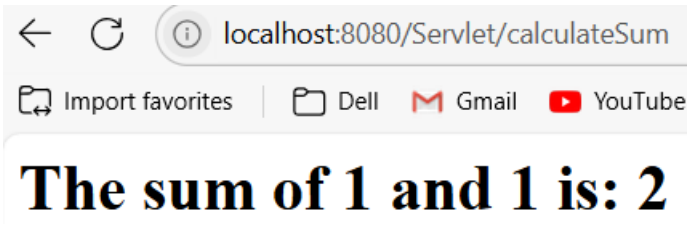
Servlet Code (CalculateSumServlet.java):

```
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:





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>
```

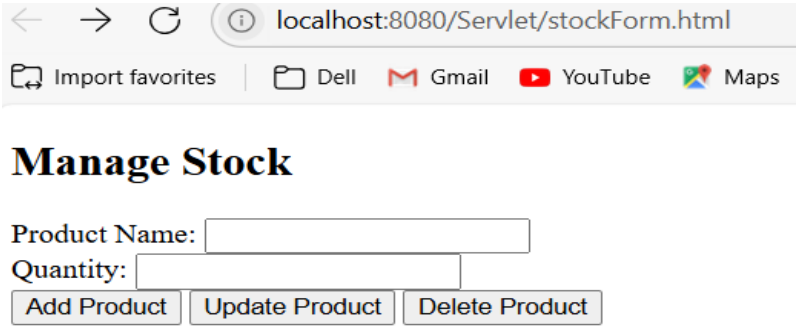
Servlet Code (StockManagementServlet.java):

```
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:



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: