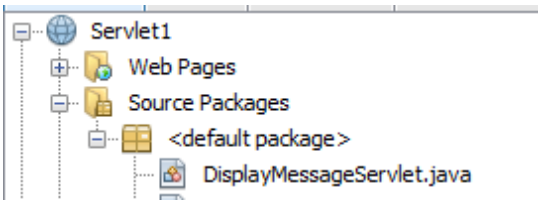
Labsheet 4 : Java Servlet

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>");

 }

}
```



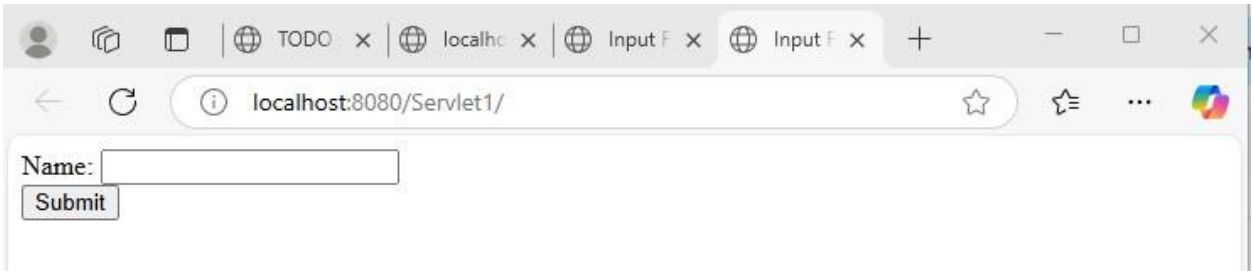
Deployment Descriptor (web.xml) (if not using annotations):

```
<?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>");
 }
}
```

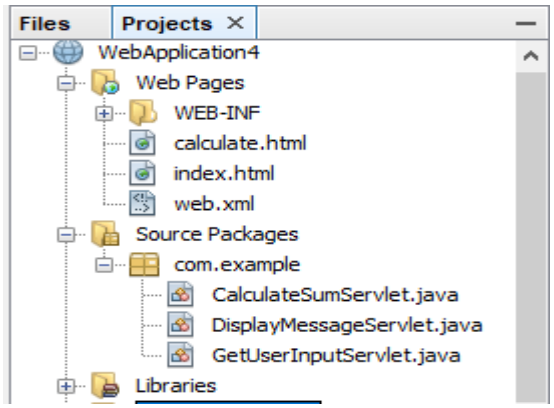
Hello, Shaini!

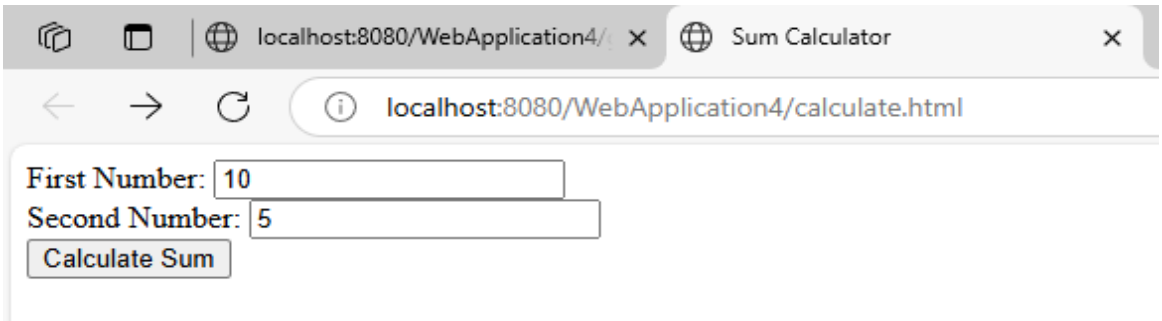
Lab Task 3: Get Multiple Inputs, Perform Calculation, and Display

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

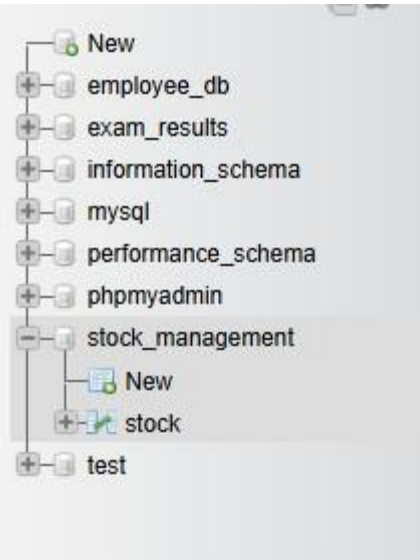
1. **Set up a database** with a table named stock (fields: id, product_name, quantity).

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>

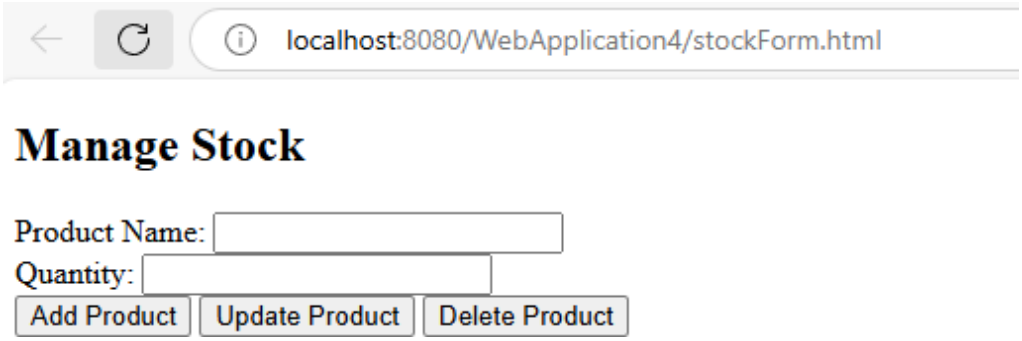
<h2>Manage Stock</h2>

<form action="stockAction" method="POST">

Product Name: <input type="text" name="product_name" required>
 Quantity: <input type="number" name="quantity" required>
 <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: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

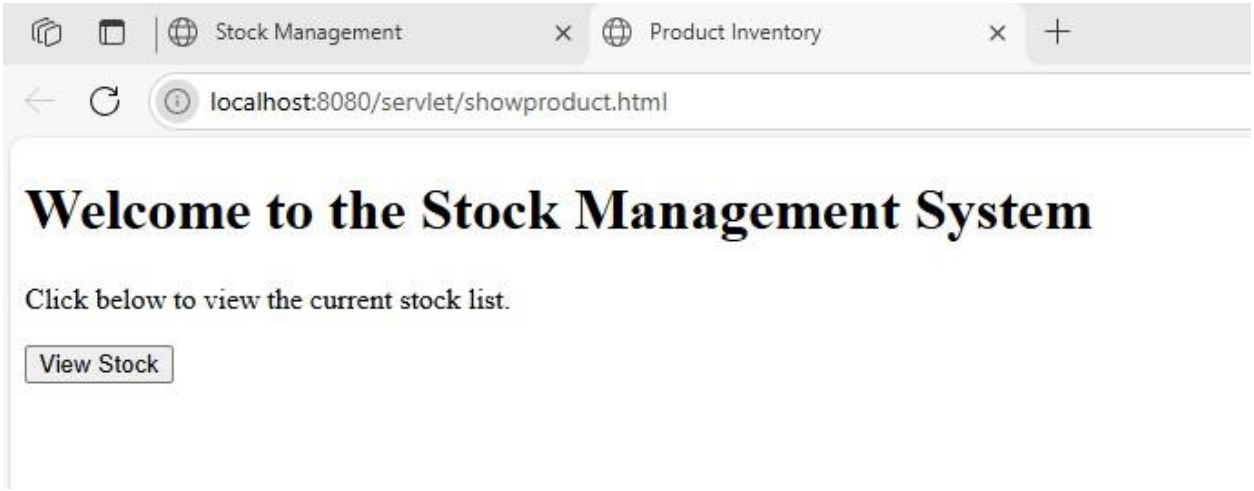
```
<!DOCTYPE html>
<html>
<head>
    <title>View Products</title>
</head>
<body>
    <h1>Welcome to Product Inventory</h1>
    <p>Click the button below to view all products in stock.</p>
    <form action="displayProducts" method="get">
        <button type="submit">Display Products</button>
    </form>
</body>
</html>
```

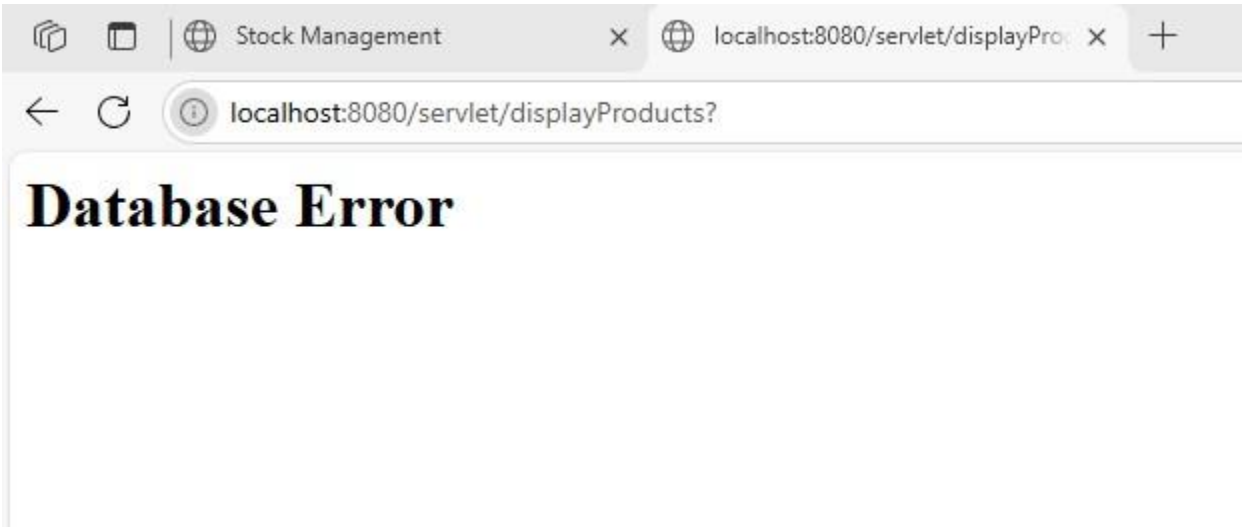
Servlet Code (DisplayProductsServlet.java):

```
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);
    }
}
```




Stock Management
localhost:8080/servlet/displayPro
localhost:8080/servlet/displayProducts?
Database Error