GAM/IT/2022/F/0064 – P. K. D. H. Madushani

Lab Sheet : Java Servlet

1.Simple Servlet - Display Static Message

Code:

```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("/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>");

}

}
```
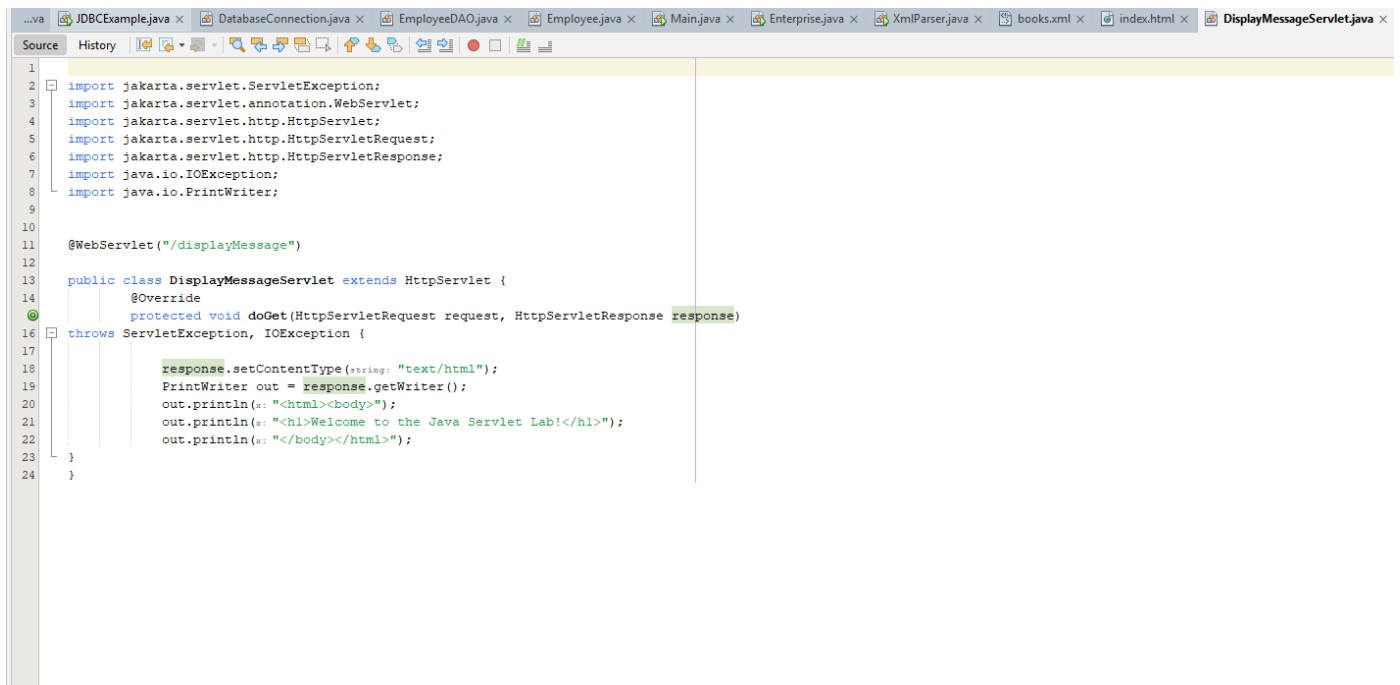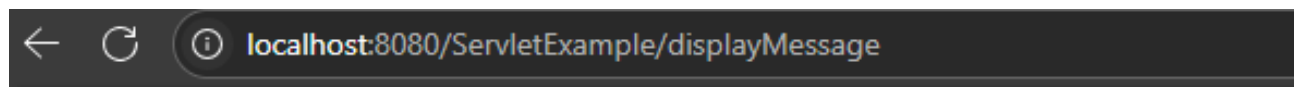
```java
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;
import java.io.IOException;
import java.io.PrintWriter;


@WebServlet("/displayMessage")

public class DisplayMessageServlet extends HttpServlet {
    @Override
    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
<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>
```

...va | JDBCExample.java × | DatabaseConnection.java × | EmployeeDAO.java × | Employee.java × | Main.java × | Enterprise.java × | XmlParser.java × | books.xml × | index.html × | **DisplayMessageServlet.java** × | web.xml ×

Source | History

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

← C ⓘ localhost:8080/ServletExample/displayMessage

Welcome to the Java Servlet Lab!

2 .Get User Input from Form and Display

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>
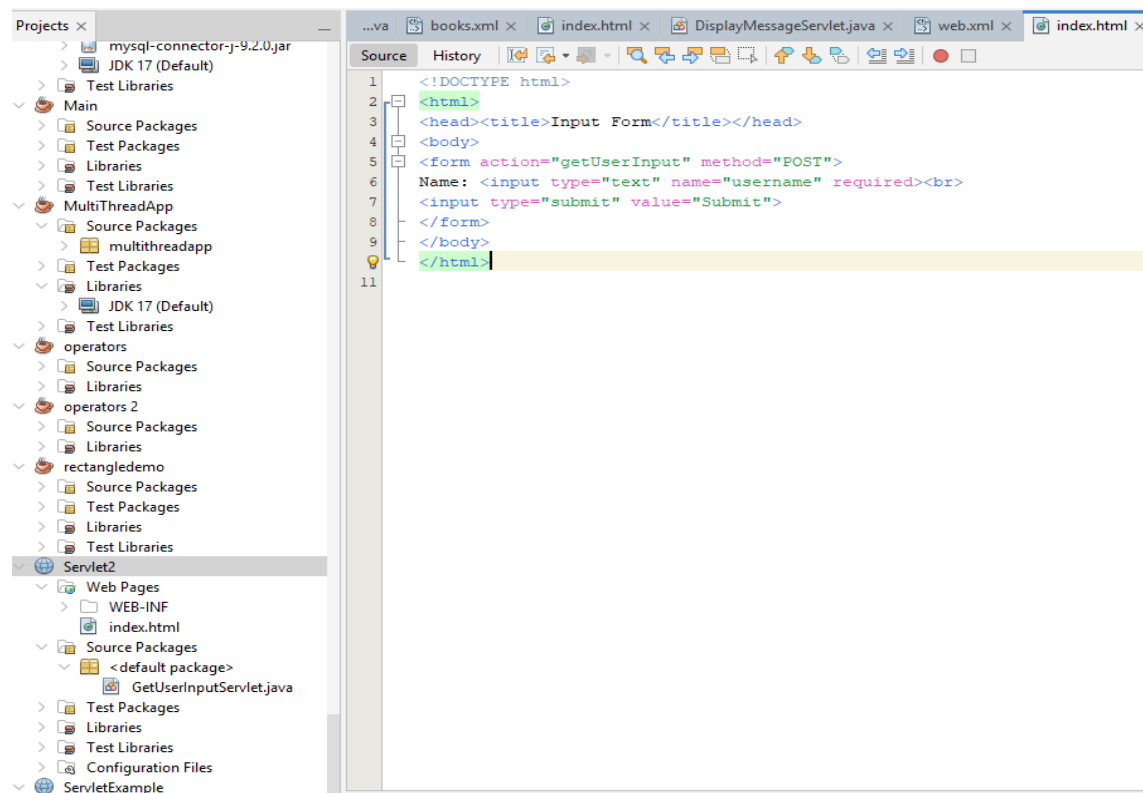
<input type="submit" value="Submit">

</form>   </body>   </html>

Servlet Code (GetUserInputServlet.java):

```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)
```

```java
        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>");
    }
}
```
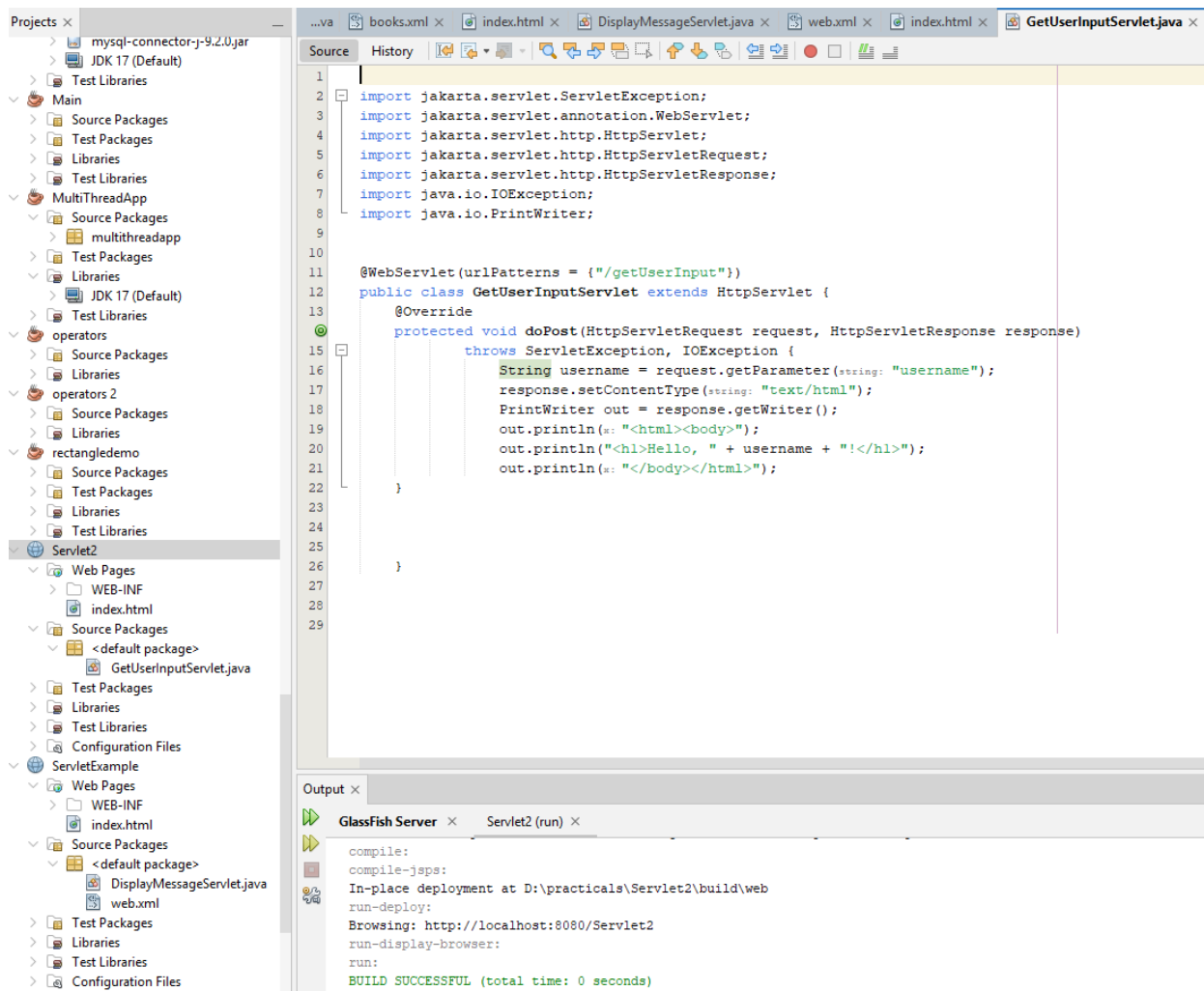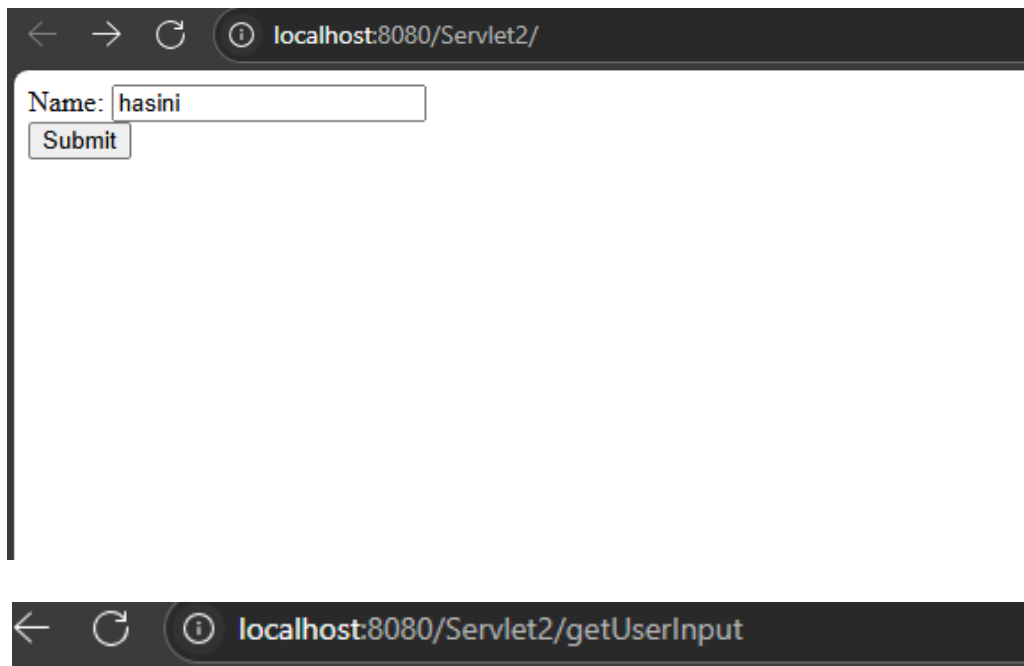
3. Get Multiple Inputs, Perform Calculation, and Display Result

HTML Form (calculate.html):

```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>

<input type="submit" value="Calculate Sum">

</form>

</body>

</html>


```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>
```

```
compile:
compile-jsps:
In-place deployment at D:\practicals\Servlet 3\build\web
run-deploy:
Browsing: http://localhost:8080/Servlet_3
run-display-browser:
run:
BUILD SUCCESSFUL (total time: 0 seconds)
```
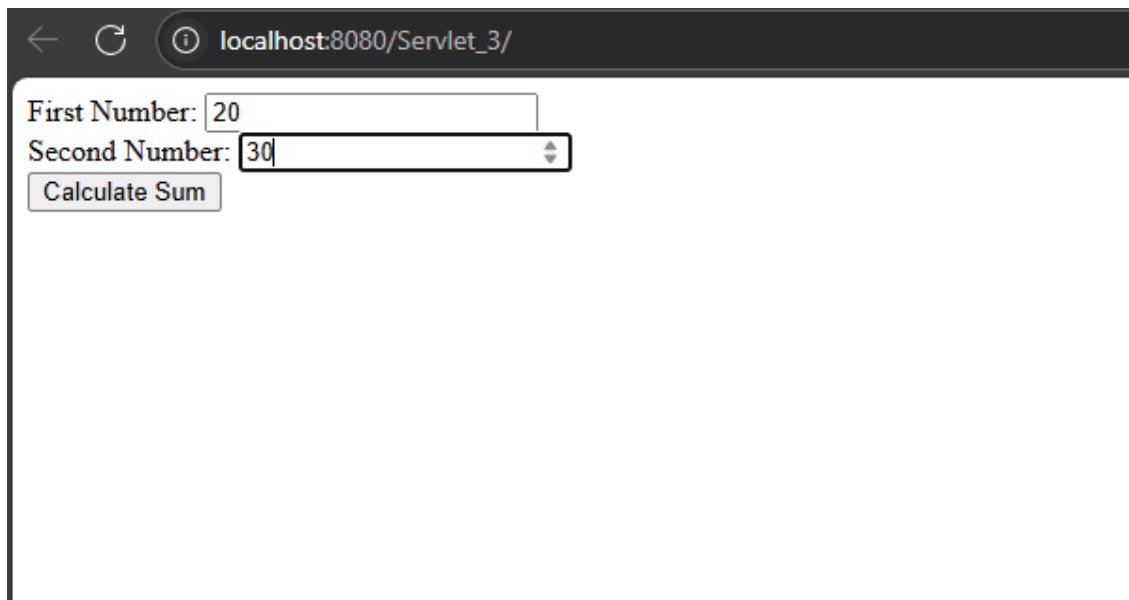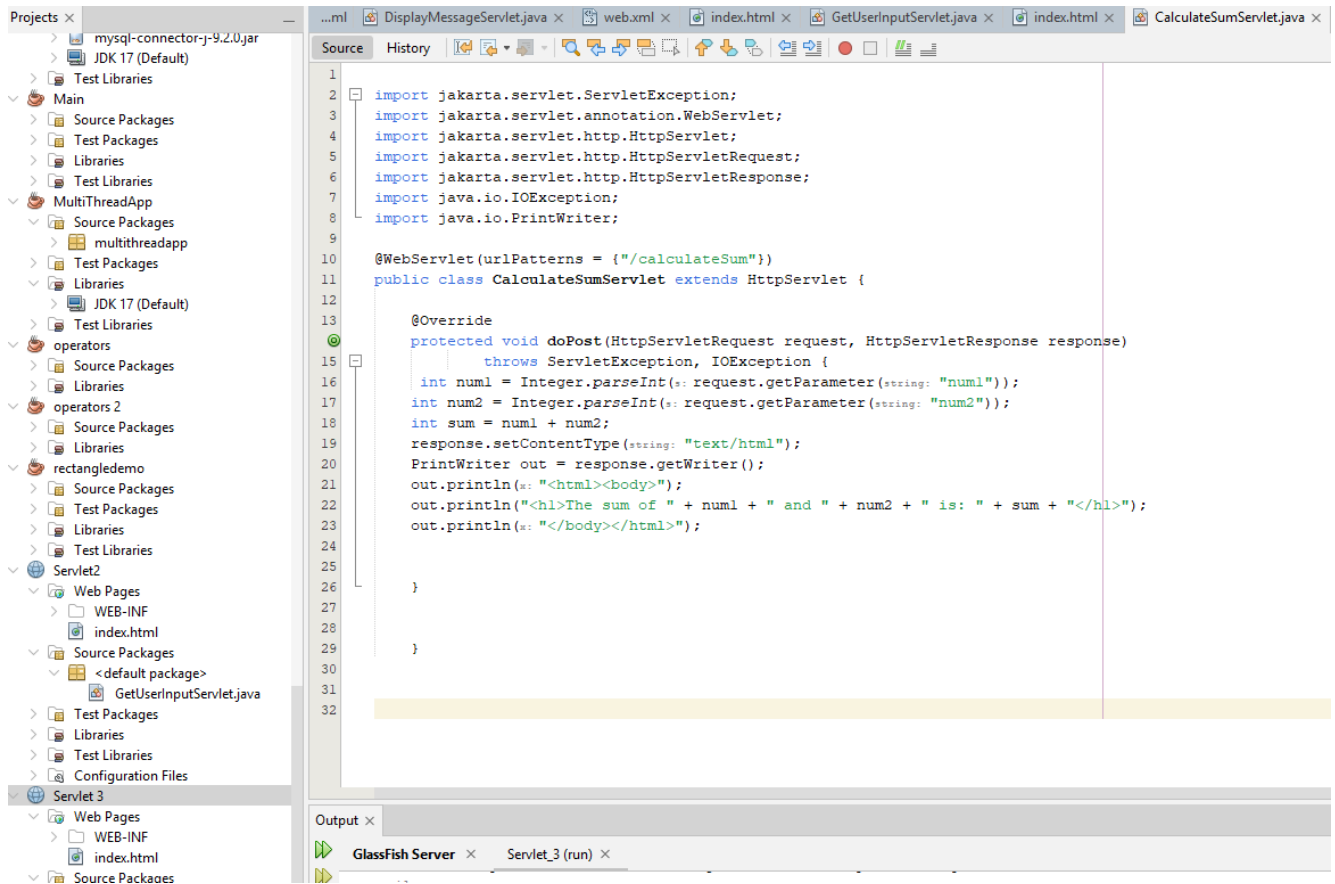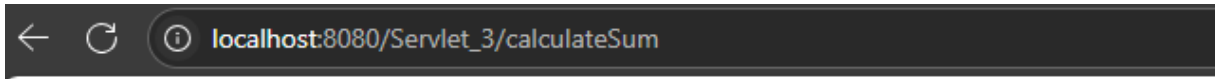
Servlet Code (CalculateSumServlet.java):

```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>");

}

}
```

Projects ✕

...ml | DisplayMessageServlet.java ✕ | web.xml ✕ | index.html ✕ | GetUserInputServlet.java ✕ | index.html ✕ | CalculateSumServlet.java ✕

Source | History

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

@WebServlet(urlPatterns = {"/calculateSum"})
public class CalculateSumServlet extends HttpServlet {

    @Override
    protected void doPost(HttpServletRequest request, HttpServletResponse response)
            throws ServletException, IOException {
        int num1 = Integer.parseInt(s: request.getParameter(string: "num1"));
        int num2 = Integer.parseInt(s: request.getParameter(string: "num2"));
        int sum = num1 + num2;
        response.setContentType(string: "text/html");
        PrintWriter out = response.getWriter();
        out.println(x: "<html><body>");
        out.println("<h1>The sum of " + num1 + " and " + num2 + " is: " + sum + "</h1>");
        out.println(x: "</body></html>");


    }


}
```

Output ✕

GlassFish Server ✕ | Servlet_3 (run) ✕

← C ⓘ localhost:8080/Servlet_3/

First Number: 20

Second Number: 30

Calculate Sum

The sum of 20 and 30 is: 50

4 .Java Servlet with Database CRUD 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);
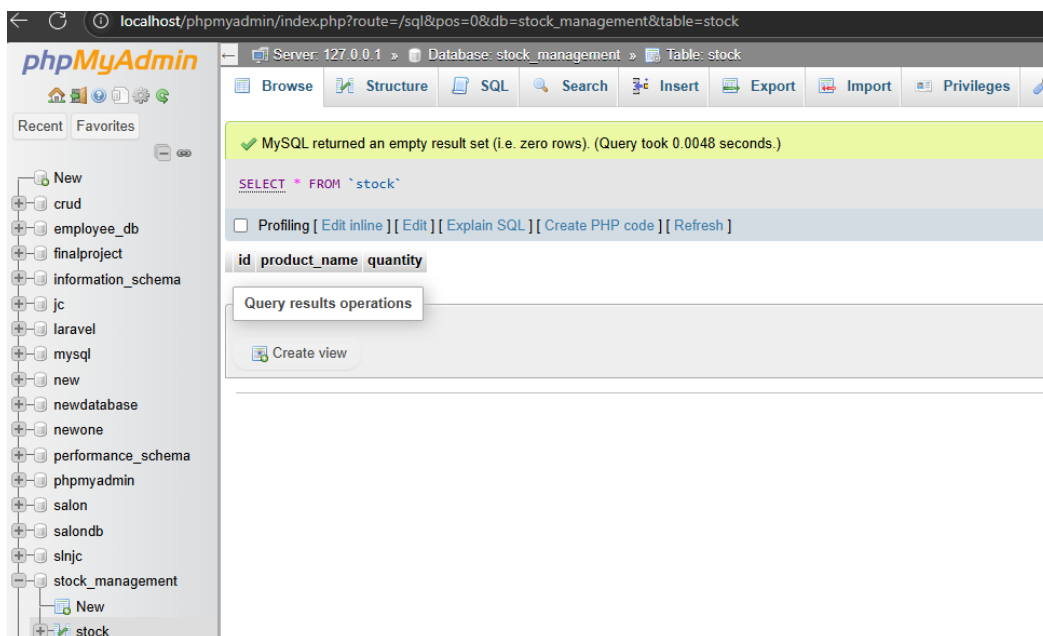
HTML Form (stockForm.html):

```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):

```java
import jakarta.servlet.ServletException;

import jakarta.servlet.annotation.WebServlet;

import jakarta.servlet.http.HttpServlet;

import jakarta.servlet.http.HttpServletRequest;

import jakarta.servlet.http.HttpServletResponse;

import java.io.IOException;

import java.io.PrintWriter;

import java.sql.*;


 @WebServlet(urlPatterns = {"/stockAction"})

public class StockManagementServlet extends HttpServlet {

    private Connection getConnection() throws SQLException {

        try {

            Class.forName("com.mysql.cj.jdbc.Driver"); // Load MySQL driver

        } catch (ClassNotFoundException e) {

            throw new SQLException("MySQL JDBC Driver not found.", e);

        }


        String url =
"jdbc:mysql://localhost:3306/stock_management?useSSL=false&allowPublicKeyRetrieval=true
&serverTimezone=UTC";

        String username = "root";

        String password = ""; // Update if you have a MySQL password


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

    }


    @Override

    protected void doPost(HttpServletRequest request, HttpServletResponse response)
```

```java
        throws ServletException, IOException {

    String action = request.getParameter("action");
    String productName = request.getParameter("product_name");
    int quantity = Integer.parseInt(request.getParameter("quantity"));

    response.setContentType("text/html");
    PrintWriter out = response.getWriter();

    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();
                    out.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();
                    out.write("<h1>Product Updated Successfully</h1>");
                }
                break;
```

```java
            case "Delete Product":

                try (PreparedStatement stmt = conn.prepareStatement(

                    "DELETE FROM stock WHERE product_name = ?")) {

                    stmt.setString(1, productName);

                    stmt.executeUpdate();

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

                }

                break;

            default:

                out.write("<h1> Invalid Action</h1>");

        }

    } catch (SQLException e) {

        e.printStackTrace();

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

    } }}
```

```java
                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();
                        out.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();
                        out.write("<h1>Product Deleted Successfully</h1>");
                    }
                    break;

                default:
                    out.write("<h1> Invalid Action</h1>");
            }
        } catch (SQLException e) {
            e.printStackTrace();
            out.write("<h1>Database Error: " + e.getMessage() + "</h1>");
        }
    }
}
```

localhost:8080/Servlet4/

Manage Stock

Product Name: Book
Quantity: 5
[Add Product] [Update Product] [Delete Product]

localhost:8080/Servlet4/stockAction

Product Added Successfully

☐ Show all | Number of rows: 25 ⌄ | Filter rows: Search this table | Sor

[Extra options]

			id	product_name	quantity
☐	🖉 Edit	⧉ Copy ⊖ Delete	1	Pencil	2
☐	🖉 Edit	⧉ Copy ⊖ Delete	2	Pencil	2
☐	🖉 Edit	⧉ Copy ⊖ Delete	3	Pen	5
☐	🖉 Edit	⧉ Copy ⊖ Delete	4	Book	5

Manage Stock

Product Name: [Book]
Quantity: [20]
[Add Product] [Update Product] [Delete Product]

Product Updated Successfully

☐ Show all | Number of rows: [25 ▾] Filter rows: [Search this ta]

[Extra options]

				id	product_name	quantity
☐	🖉 Edit	Copy	⊖ Delete	1	Pencil	2
☐	🖉 Edit	Copy	⊖ Delete	2	Pencil	2
☐	🖉 Edit	Copy	⊖ Delete	3	Pen	5
☐	🖉 Edit	Copy	⊖ Delete	4	Book	20

Product Deleted Successfully

5 .Display Data from Database on Another Web Page

Servlet Code (DisplayProductsServlet.java):

```java
import jakarta.servlet.ServletException;

import jakarta.servlet.annotation.WebServlet;

import jakarta.servlet.http.HttpServlet;

import jakarta.servlet.http.HttpServletRequest;

import jakarta.servlet.http.HttpServletResponse;

import java.io.IOException;

import java.io.PrintWriter;

import java.sql.*;

@WebServlet(urlPatterns = {"/DisplayProducts"})
public class DisplayProductsServlet extends HttpServlet {
 private Connection getConnection() throws SQLException {
     try {
        Class.forName("com.mysql.cj.jdbc.Driver"); // Load MySQL JDBC driver
     } catch (ClassNotFoundException e) {
        throw new SQLException("MySQL JDBC Driver not found.", e);
     }
```

```java
        String url =
"jdbc:mysql://localhost:3306/stock_management?useSSL=false&allowPublicKeyRetrieval=true
&serverTimezone=UTC";

        String username = "root";

        String password = ""; // Use your MySQL password if set

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

    }

@Override

    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><head><title>Stock List</title></head><body>");

            out.println("<h1>Stock List</h1>");

            out.println("<ul>");


            while (rs.next()) {

                out.println("<li>" + rs.getString("product_name") + ": " + rs.getInt("quantity") +
"</li>");

            }

             out.println("</ul>");

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

        } catch (SQLException e) {

            e.printStackTrace();

            out.println("<h1>Database Error: " + e.getMessage() + "</h1>"); }}}
```

```java
1   import jakarta.servlet.ServletException;
2   import jakarta.servlet.annotation.WebServlet;
3   import jakarta.servlet.http.HttpServlet;
4   import jakarta.servlet.http.HttpServletRequest;
5   import jakarta.servlet.http.HttpServletResponse;
6   import java.io.IOException;
7   import java.io.PrintWriter;
8   import java.sql.*;
9
10  @WebServlet(urlPatterns = {"/DisplayProducts"})
11  public class DisplayProductsServlet extends HttpServlet {
12   private Connection getConnection() throws SQLException {
13          try {
14              Class.forName(className: "com.mysql.cj.jdbc.Driver"); // Load MySQL JDBC driver
15          } catch (ClassNotFoundException e) {
16              throw new SQLException(reason: "MySQL JDBC Driver not found.", cause: e);
17          }
18
19          String url = "jdbc:mysql://localhost:3306/stock_management?useSSL=false&allowPublicKeyRetrieval=true&serverTimezone=UTC";
20          String username = "root";
21          String password = ""; // Use your MySQL password if set
22          return DriverManager.getConnection(url, user: username, password);
23      }
24  @Override
    protected void doGet(HttpServletRequest request, HttpServletResponse response)
26          throws ServletException, IOException {
27
28          response.setContentType(string: "text/html");
29          PrintWriter out = response.getWriter();
30
31          try (Connection conn = getConnection()) {
32              Statement stmt = conn.createStatement();
33              ResultSet rs = stmt.executeQuery(string: "SELECT * FROM stock");
34
35              out.println(x: "<html><head><title>Stock List</title></head><body>");
36              out.println(x: "<h1>Stock List</h1>");
37              out.println(x: "<ul>");
38
39              while (rs.next()) {
40                  out.println("<li>" + rs.getString(string: "product_name") + ": " + rs.getInt(string: "quantity") + "</li>");
41              }
42              out.println(x: "</ul>");
43              out.println(x: "</body></html>");
44          } catch (SQLException e) {
45              e.printStackTrace();
46              out.println("<h1>Database Error: " + e.getMessage() + "</h1>");
47          }
48      }
    }
```

---

localhost:8080/Servlet5/DisplayProducts

Stock List

- Pencil: 2
- Pencil: 2
- Pen: 5