

## Lab Sheet 4: Java Servlet

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

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

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE glassfish-web-app PUBLIC "-//GlassFish.org//DTD GlassFish Application Server 3.1
Servlet 3.0//EN"
```

```
"http://glassfish.org/dtds/glassfish-web-app_3_0-1.dtd">

<glassfish-web-app error-url="">

<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>

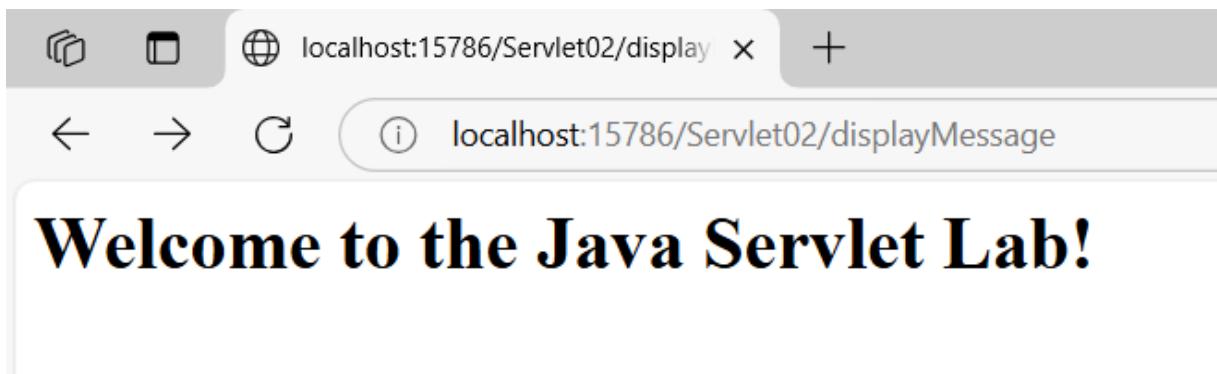
        <servlet-name>DisplayMessageServlet</servlet-name>

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

    </servlet-mapping>

</web-app>

</glassfish-web-app>
```



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

- Index.html

```
<!DOCTYPE html>
<html>
<head>
    <title>Input Form</title>
    <style>
        body {
            font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
            background-color: #121212;
            display: flex;
            justify-content: center;
            align-items: center;
            height: 100vh;
            margin: 0;
            color: #e0e0e0;
        }

        form {
            background-color: #1e1e1e;
            padding: 25px 35px;
            border-radius: 12px;
            box-shadow: 0 6px 12px rgba(0,0,0,0.3);
            width: 300px;
            border: 1px solid #333;
        }

        input[type="text"] {
            padding: 12px;
            width: 100%;
            margin: 8px 0 20px 0;
            border: 1px solid #444;
            border-radius: 6px;
            font-size: 16px;
            background-color: #2d2d2d;
            color: #ffffff;
            transition: border 0.3s;
        }
    </style>

```

```
}

input[type="text"]:focus {
    border-color: #9c27b0;
    outline: none;
}

input[type="submit"] {
    background-color: #7b1fa2;
    color: white;
    padding: 12px 24px;
    border: none;
    border-radius: 6px;
    font-size: 16px;
    cursor: pointer;
    width: 100%;
    transition: background-color 0.3s;
}

input[type="submit"]:hover {
    background-color: #9c27b0;
}

label {
    font-weight: 600;
    color: #bb86fc;
    font-size: 14px;
    text-transform: uppercase;
    letter-spacing: 0.5px;
}

h1 {
    color: #bb86fc;
    text-align: center;
    margin-bottom: 25px;
}

</style>
</head>
```

```

<body>
    <form action="getUserInput" method="POST">
        <h1>User Login</h1>
        <label for="username">Your Name:</label>
        <input type="text" name="username" id="username" required
placeholder="Enter your name">
        <input type="submit" value="Submit">
    </form>
</body>
</html>

```

- Servlet Code ( GetUserInputServlet.java):

```

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

/**
 *
 * @author USER
 */
@WebServlet(urlPatterns = {" /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>");
    }
}

```

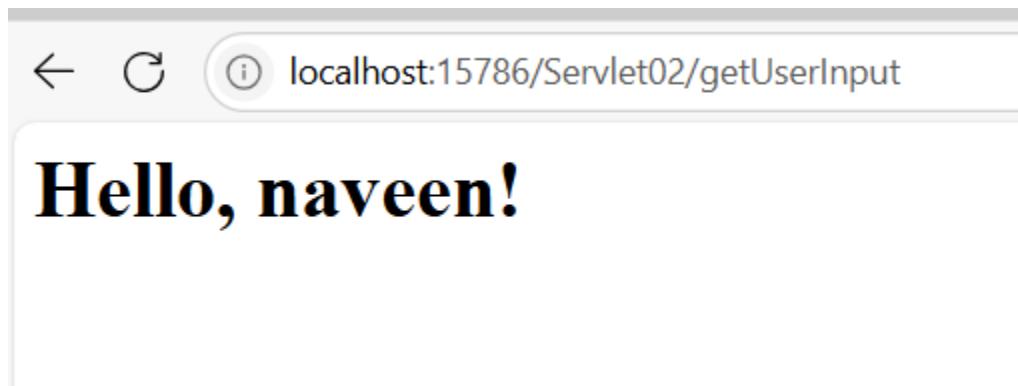
}

**Name**

YOUR NAME:

naveen

**Submit**



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

- Calculate.html

```
<!DOCTYPE html>
<html>
<head>
<title>Sum Calculator</title>
```

```
<style>
body {
    font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
    background-color: #f5f7fa;
    display: flex;
    justify-content: center;
    align-items: center;
    height: 100vh;
    margin: 0;
}
form {
    background-color: white;
    padding: 30px 40px;
    border-radius: 12px;
    box-shadow: 0 5px 15px rgba(0, 0, 0, 0.08);
    width: 320px;
}
h2 {
    text-align: center;
    margin-bottom: 25px;
    color: #4a6cf7;
    font-size: 24px;
}
label {
    display: block;
    margin-bottom: 8px;
    color: #555;
    font-weight: 500;
}
input[type="number"] {
    width: 100%;
    padding: 12px 15px;
    margin-bottom: 20px;
    border: 1px solid #e0e0e0;
    border-radius: 8px;
    font-size: 16px;
    transition: border 0.3s;
}
```

```

        input[type="number"]:focus {
            border-color: #4a6cf7;
            outline: none;
        }
        input[type="submit"] {
            width: 100%;
            padding: 12px;
            background-color: #4a6cf7;
            color: white;
            font-size: 16px;
            font-weight: 500;
            border: none;
            border-radius: 8px;
            cursor: pointer;
            transition: background-color 0.3s;
        }
        input[type="submit"]:hover {
            background-color: #3a5bd9;
        }
    </style>
</head>
<body>
    <form action="calculateSum" method="POST">
        <h2>Sum Calculator</h2>

        <label for="num1">First Number:</label>
        <input type="number" name="num1" id="num1" required>

        <label for="num2">Second Number:</label>
        <input type="number" name="num2" id="num2" required>

        <input type="submit" value="Calculate Sum">
    </form>
</body>
</html>

```

- Servlet Code (CalculateSumServlet.java):

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

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

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

        // Retrieve and parse the input numbers from the request
        int num1 = Integer.parseInt(request.getParameter("num1"));
        int num2 = Integer.parseInt(request.getParameter("num2"));

        // Calculate the sum
        int sum = num1 + num2;

        // Set response content type
        response.setContentType("text/html");

        // Generate HTML response
        PrintWriter out = response.getWriter();
        out.println("<!DOCTYPE html>");
        out.println("<html>");
        out.println("<head>");
        out.println("<title>Sum Result</title>");
        out.println("<style>");
```

```
        out.println("body { font-family: Arial, sans-serif; background-color: #f0f8ff; text-align: center; padding-top: 50px; }");
        out.println("h1 { color: #333; }");
        out.println("</style>");
        out.println("</head>");
        out.println("<body>");
        out.println("<h1>The sum of " + num1 + " and " + num2 + " is: <strong>" + sum + "</strong></h1>");
        out.println("</body>");
        out.println("</html>");
    }
}
```

The screenshot shows a web browser displaying a Java Servlet application. The title of the page is "Sum Calculator". There are two input fields: "First Number" containing "10" and "Second Number" containing "5". Below the inputs is a blue button labeled "Calculate Sum". The browser's address bar shows the URL "localhost:15786/Servlet02/calculateSum". The main content area of the browser displays the result: "The sum of 10 and 5 is: 15".

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

- Database Setup

```
CREATE DATABASE stock_management;  
USE stock_management;
```

```
CREATE TABLE stock (  
    id INT AUTO_INCREMENT PRIMARY KEY,  
    product_name VARCHAR(255),  
    quantity INT  
);
```

- stockForm.html

```
<!DOCTYPE html>  
<html lang="en">  
<head>  
    <meta charset="UTF-8">  
    <title>Stock Management</title>  
    <!-- Bootstrap CSS CDN -->  
    <link  
        href="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/css/bootstrap.min.css"  
        rel="stylesheet">  
    <style>  
        .card-header {  
            background-color: #6f42c1; /* Purple header */  
        }  
        .btn-add {  
            background-color: #20c997; /* Teal add button */  
            border-color: #20c997;  
        }  
        .btn-update {  
            background-color: #fd7e14; /* Orange update button */  
            border-color: #fd7e14;  
        }  
        .btn-delete {  
            background-color: #dc3545; /* Red delete button */  
            border-color: #dc3545;  
        }  
        body {
```

```

        background-color: #f8f9fa;
    }
    .card {
        border: none;
        border-radius: 10px;
    }

```

</style>

</head>

<body>

```

<div class="container mt-5">
    <div class="card shadow">
        <div class="card-header text-white">
            <h2 class="mb-0">Manage Stock</h2>
        </div>
        <div class="card-body">
            <form action="stockAction" method="POST">
                <div class="mb-3">
                    <label for="product_name" class="form-label">Product Name:</label>
                    <input type="text" class="form-control" id="product_name"
name="product_name" required>
                </div>

                <div class="mb-3">
                    <label for="quantity" class="form-label">Quantity:</label>
                    <input type="number" class="form-control" id="quantity"
name="quantity" required>
                </div>

                <div class="d-flex gap-2">
                    <button type="submit" name="action" value="Add Product" class="btn
btn-add text-white">Add Product</button>
                    <button type="submit" name="action" value="Update Product"
class="btn btn-update text-white">Update Product</button>
                    <button type="submit" name="action" value="Delete Product" class="btn
btn-delete text-white">Delete Product</button>
                </div>
            </form>
        </div>
    </div>
</div>

```

```
</div>
</div>
</div>

<!-- Bootstrap JS (Optional) -->
<script
src="https://cdn.jsdelivr.net/npm/bootstrap@5.3.0/dist/js/bootstrap.bundle.min.js"
></script>
</body>
</html>
```

- Servlet Code (StockManagementServlet.java):

```
import java.io.IOException;
import java.io.PrintWriter;
import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.PreparedStatement;
import java.sql.SQLException;
import jakarta.servlet.ServletException;
import jakarta.servlet.annotation.WebServlet;
import jakarta.servlet.http.HttpServlet;
import jakarta.servlet.http.HttpServletRequest;
import jakarta.servlet.http.HttpServletResponse;

@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&allowPublicKeyR
etrieval=true&serverTimezone=UTC";
String username = "root";
String password = "root"; // Update if you have a MySQL password

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

@Override
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"));

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> 

```

```

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>");
}
}
}

```

Add:

The screenshot shows a web-based application interface titled "Manage Stock". At the top, there is a blue header bar. Below it, a form is displayed with two input fields: "Product Name" containing "car" and "Quantity" containing "20". At the bottom of the form are three buttons: "Add Product" (blue), "Update Product" (green), and "Delete Product" (red).

? Product Added Successfully

	id	product_name	quantity
▶	1	Apple	10
	2	Banana	10
*	HULL	HULL	HULL

Update:

? Product Updated Successfully

	id	product_name	quantity
▶*	4	car	20
	5	van	30
▶*	HULL	HULL	HULL

### Delete:

The screenshot shows a web browser window with the URL `localhost:15786/Servlet02/stockAction`. The main content of the page is a large, bold, dark blue header that reads **? Product Deleted Successfully**. Below this, there is a table titled "Result Grid" with three columns: "id", "product\_name", and "quantity". The table contains one row with values 4, car, and 20. There are also some NULL entries in the table.

	id	product_name	quantity
▶*	4	car	20
	NULL	NULL	NULL

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

```
@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);
        }

        String url =
"jdbc:mysql://localhost:3306/stock_management?useSSL=false&allowPublicKeyRetrieval=true&
serverTimezone=UTC";
        String username = "root";
        String password = "root"; // 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>");
}
}
}

```

---

## ? Stock List

- car: 20

