SEG3102 – Lab 1
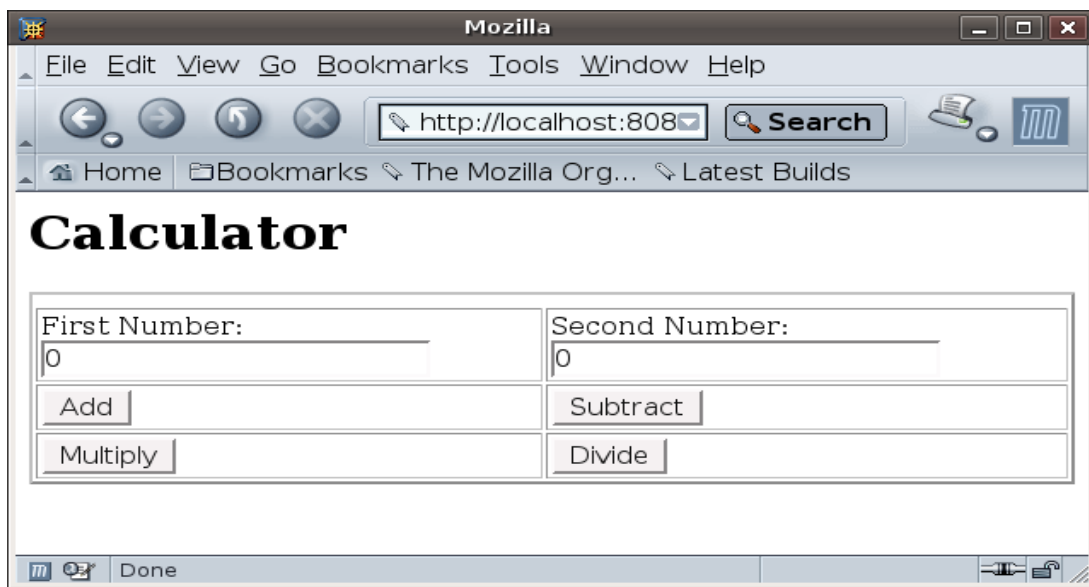
Introduction to Servlets and Netbeans IDE

The objective of this lab is to introduce to Servlets programming using Netbeans IDE.

Task

In this lab, you will implement a simple *servlet based Calculator*.

The user enters two numbers using a form and click on a button for an operation (addition, substraction, multiplication, division). The calculator servlet should then perform the requested operation and present a page with the result.
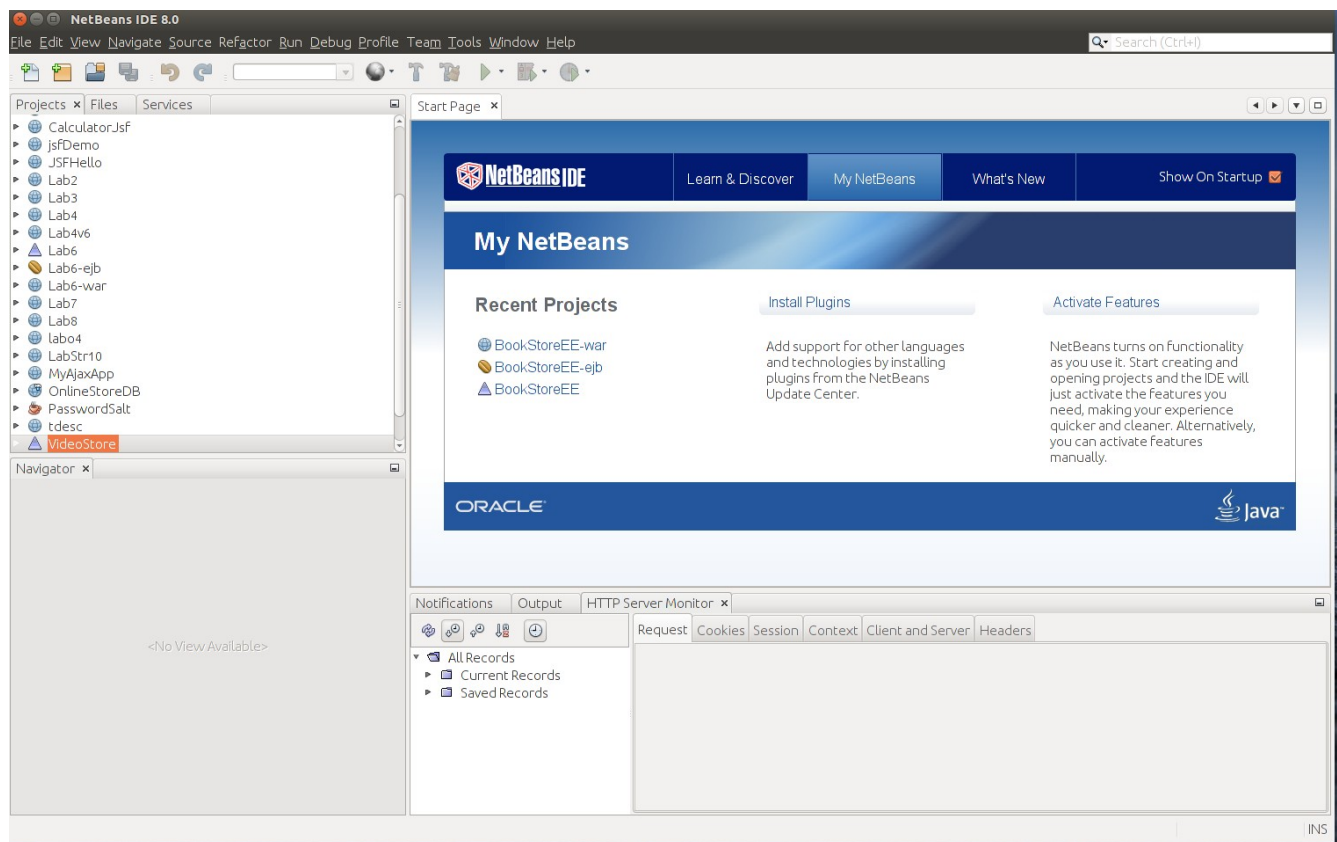
Steps

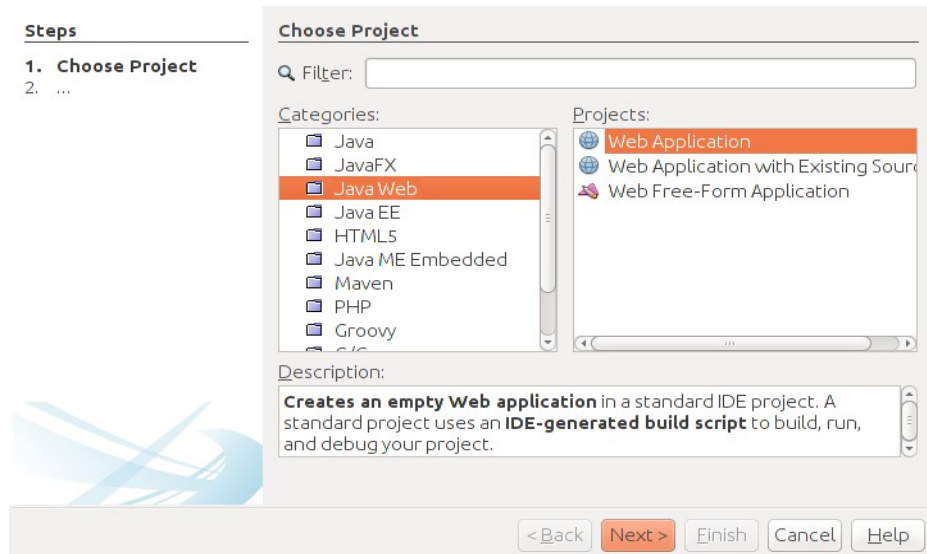You will perform the following steps:

1. create a project
2. create the form page
3. create the calculator servlet
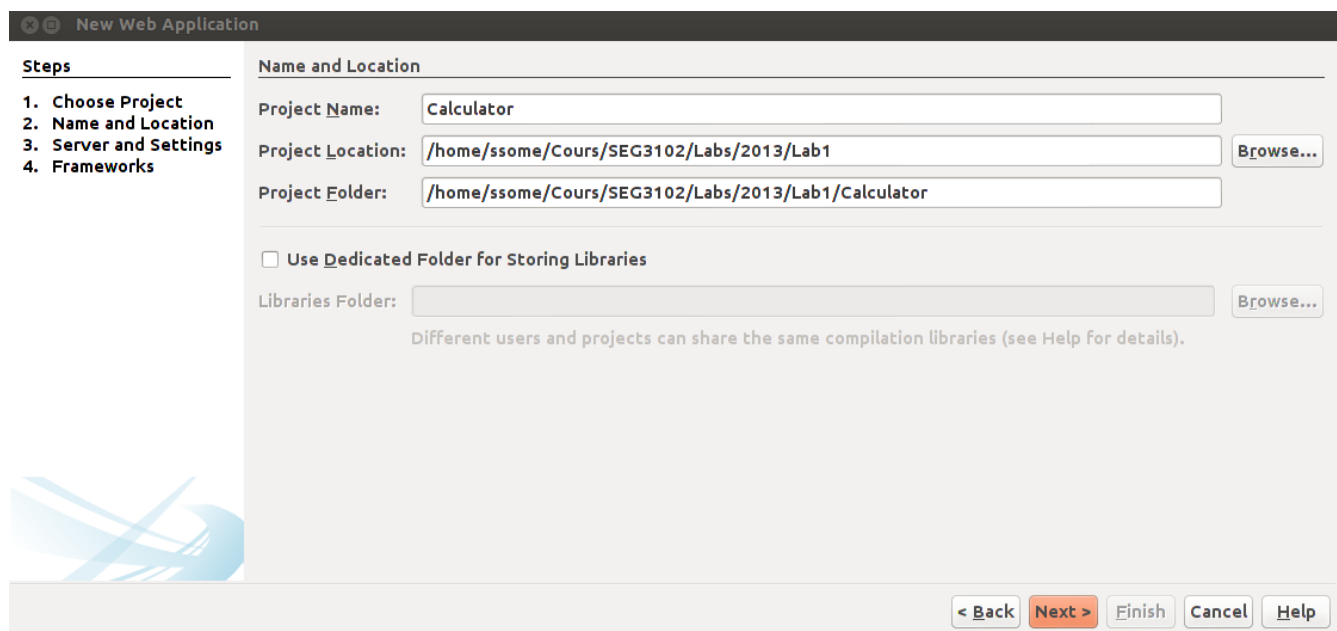4. build and run

Create project

1. Start the IDE

2. Goto **File -> New Project**

Select **Java Web** in **Categories** and **Web Application** in **Projects,** and click **Next>.**

Enter project name: *Calculator*, browse to a project location, click **Next**, leave everything else as it is and click **Finish.**

The IDE should show the new project as follow.

Note that the IDE automatically created a HTML file (index.html).

1. Add Form element – Open the Palette (**Window -> IDE Tools -> Palette**)

The IDE includes an editor that can be used to quickly create HTML pages by dragging and dropping. Click on the **Form** in the Palette and drag between `<body><div>` and `</div>/body>`.

Set **Action** as *calculate* and **Name** as *calculateForm,* then click **OK**.

2. Add <h1>Calculator</h1> after `<div>`

3. Drag a **Table** from the Palette just before element </form>. Specify number of rows as 3 and number of column 2.

4. Drag a **Text input** element from the Palette to between the first `<td>` and `</td>` in `<tboby>`. Specify First as name and 0 as initial value. Write "*First Number:* " before element `<input>`.

5. Drag a **Text input** element from the Palette to between the second `<td>` and `</td>` in `<tboby>`. Specify Second as name and 0 as initial value. Write "*Second Number:* " before element `<input>`.

6. Drag a **Button** element from the Palette to between the third `<td>` and `</td>` in `<tboby>`. Specify *Add* as label and *add* as name.

7. Drag a **Button** element from the Palette to between the fourth `<td>` and `</td>` in `<tboby>`. Specify *Subtract* as label and *subtract* as name.

8. Drag a **Button** element from the Palette to between the fifth `<td>` and `</td>` in `<tboby>`. Specify *Multiply* as label and *multiply* as name.

9. Drag a **Button** element from the Palette to between the sixth `<td>` and `</td>` in `<tboby>`. Specify *Divide* as label and *divide* as name.

The end result should be as follow:

```html
<html>
    <head>
        <title>TODO supply a title</title>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
    </head>
    <body>
        <div>
            <h1>Calculator</h1>
            <form name="calculateForm" action="calculate"><table border="1">
                <thead>
                    <tr>
                        <th></th>
                        <th></th>
                    </tr>
                </thead>
            <tbody>
                <tr>
                    <td>First Number: <input type="text" name="First" value="0" /></td>
                    <td>Second Number: <input type="text" name="Second" value="0" /></td>
                </tr>
                <tr>
                    <td><input type="submit" value="Add" name="add" /></td>
                    <td><input type="submit" value="Subtract" name="subtract" /></td>
                </tr>
                <tr>
                    <td><input type="submit" value="Multiply" name="multiply" /></td>
                    <td><input type="submit" value="Divide" name="divide" /></td>
                </tr>
            </tbody>
                </table>

        </form>
        </div>
    </body>
</html>
```
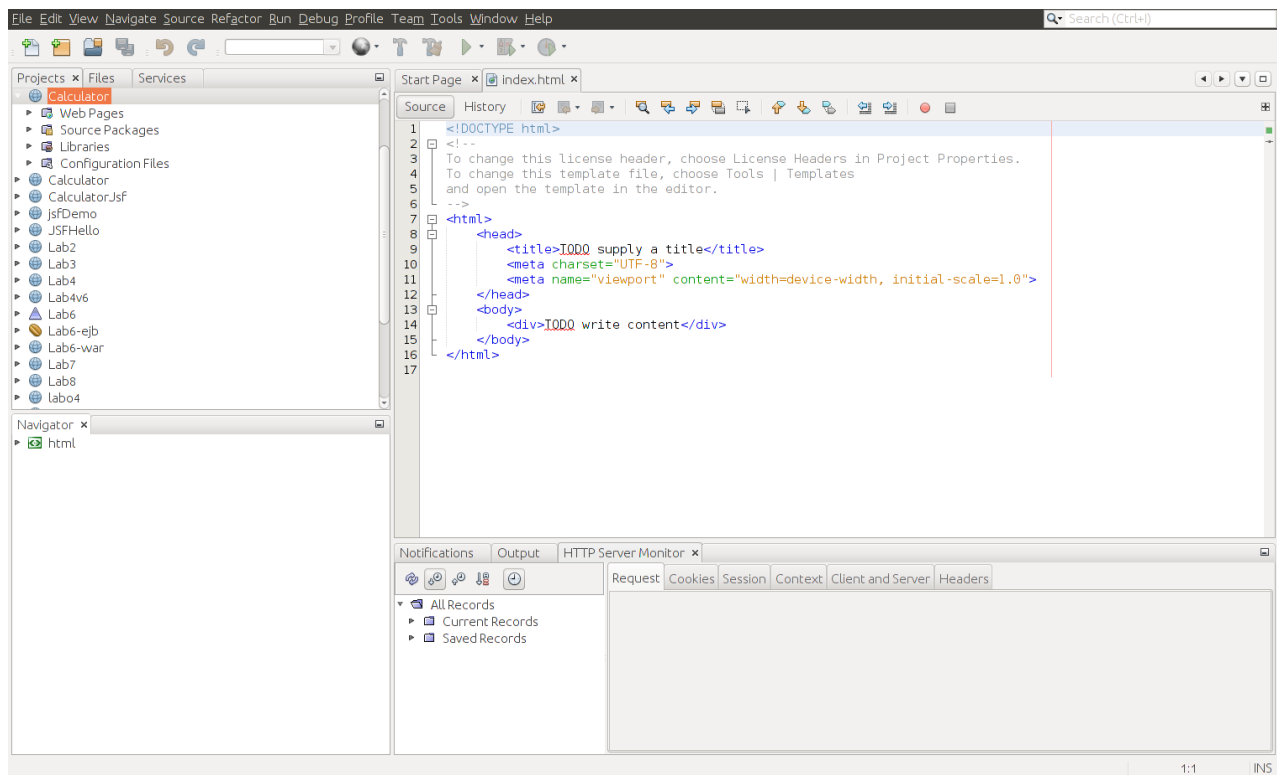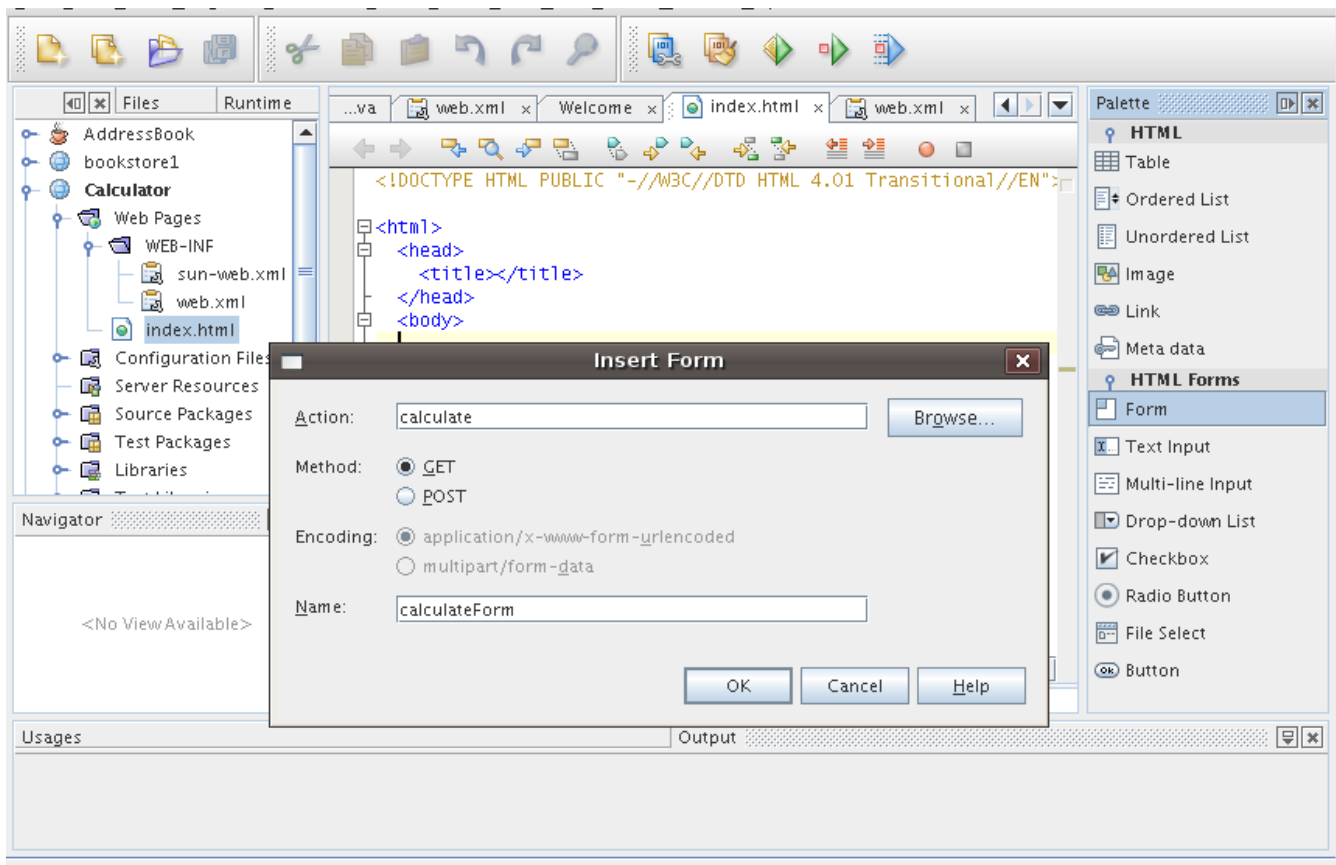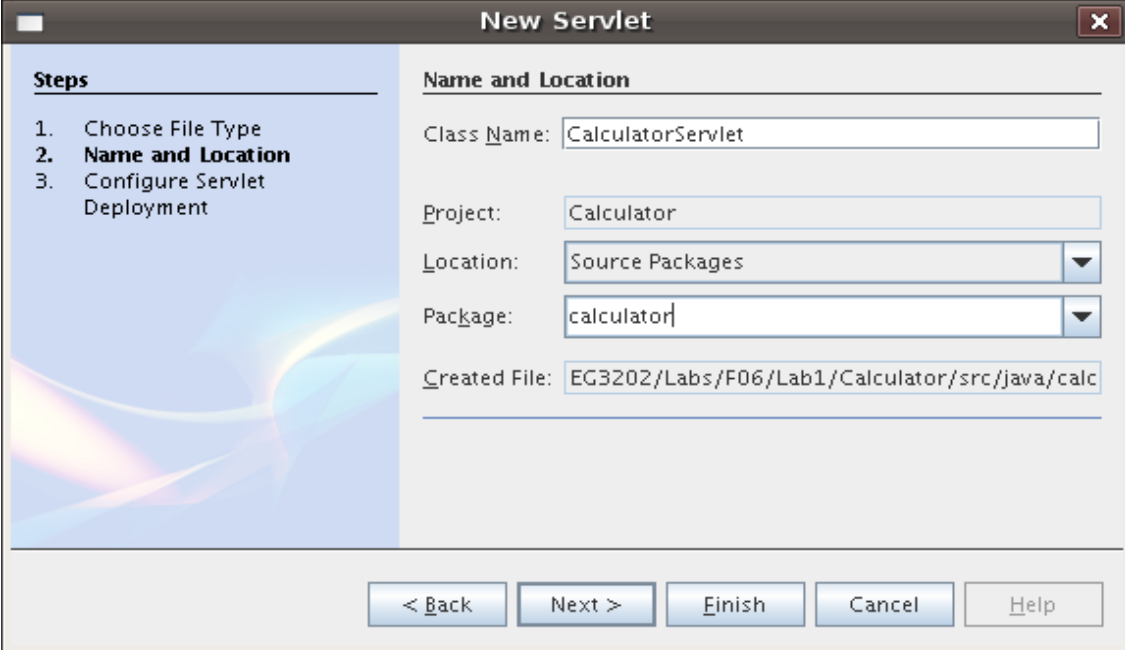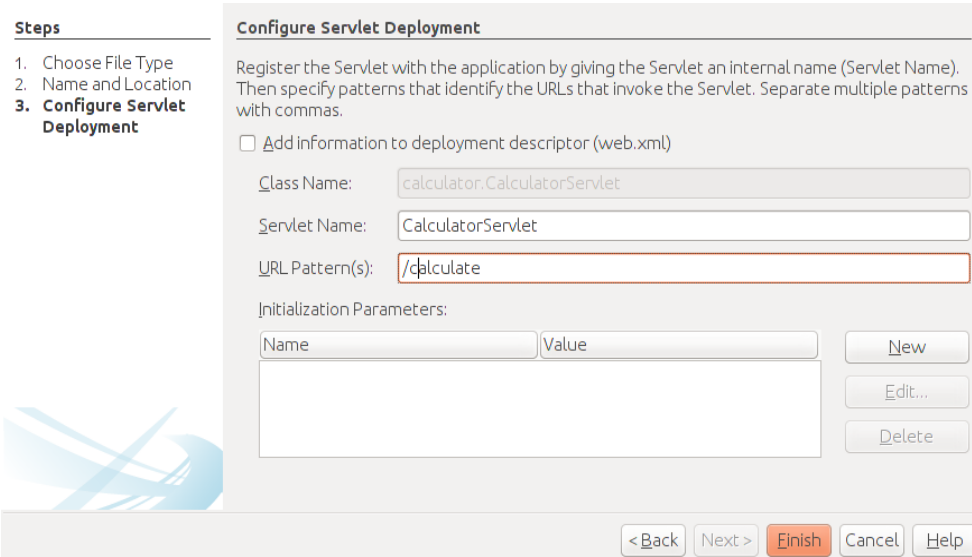
Create Calculator servlet
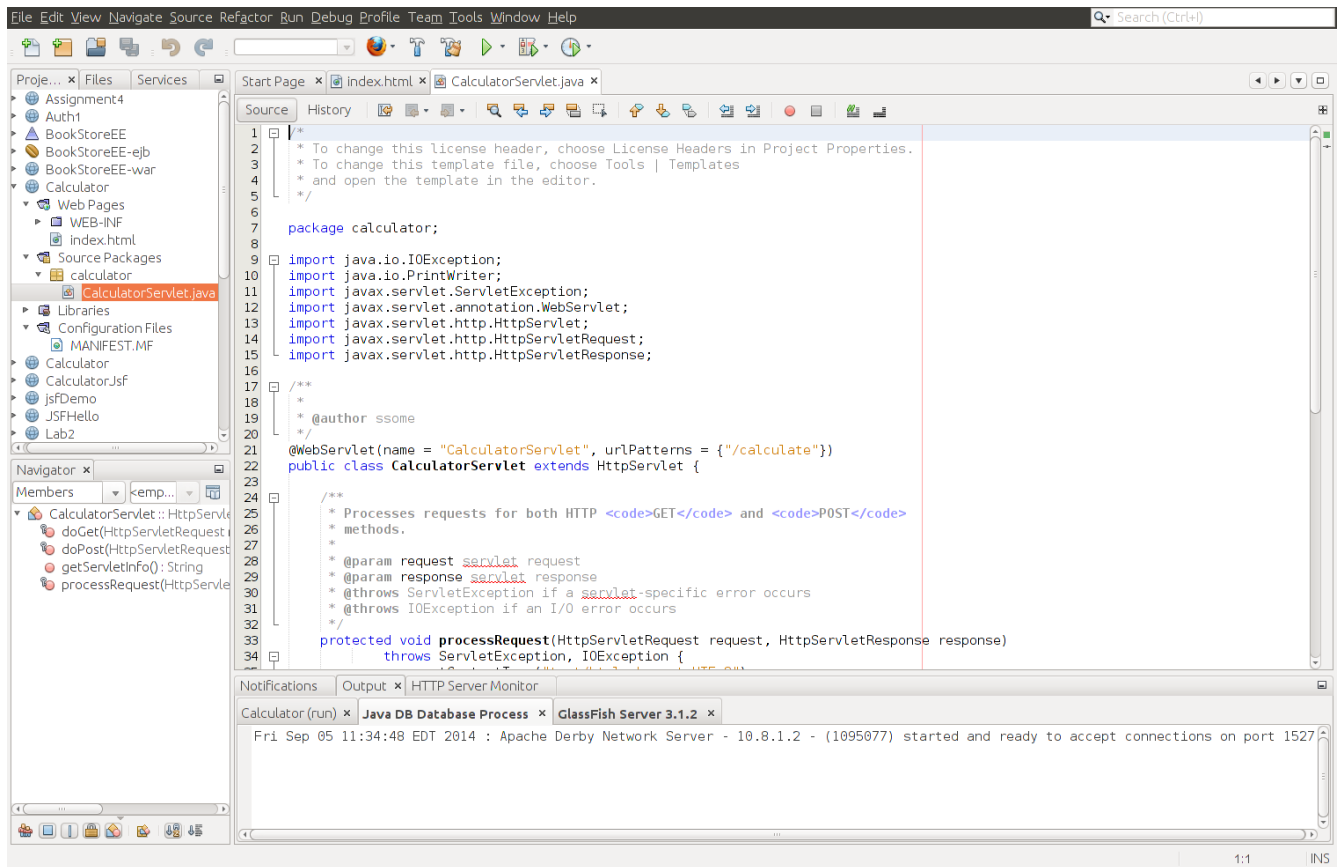
1. Righ-click on the project and select **New -> Servlet**

Specify *CalculatorServlet* as **Class Name** and *calculator* as **Package**, click **Next**.

Change **URL Pattern(s)** to */calculate* and click **Finish**.

Proje... × Files Services

Start Page × index.html × CalculatorServlet.java ×

Source History

```
1    /*
2     * To change this license header, choose License Headers in Project Properties.
3     * To change this template file, choose Tools | Templates
4     * and open the template in the editor.
5     */
6
7    package calculator;
8
9    import java.io.IOException;
10   import java.io.PrintWriter;
11   import javax.servlet.ServletException;
12   import javax.servlet.annotation.WebServlet;
13   import javax.servlet.http.HttpServlet;
14   import javax.servlet.http.HttpServletRequest;
15   import javax.servlet.http.HttpServletResponse;
16
17   /**
18    *
19    * @author ssome
20    */
21   @WebServlet(name = "CalculatorServlet", urlPatterns = {"/calculate"})
22   public class CalculatorServlet extends HttpServlet {
23
24       /**
25        * Processes requests for both HTTP <code>GET</code> and <code>POST</code>
26        * methods.
27        *
28        * @param request servlet request
29        * @param response servlet response
30        * @throws ServletException if a servlet-specific error occurs
31        * @throws IOException if an I/O error occurs
32        */
33       protected void processRequest(HttpServletRequest request, HttpServletResponse response)
34               throws ServletException, IOException {
```

Projects tree:
- Assignment4
- Auth1
- BookStoreEE
- BookStoreEE-ejb
- BookStoreEE-war
- Calculator
  - Web Pages
    - WEB-INF
    - index.html
  - Source Packages
    - calculator
      - CalculatorServlet.java
  - Libraries
  - Configuration Files
    - MANIFEST.MF
- Calculator
- CalculatorJsf
- jsfDemo
- JSFHello
- Lab2

Navigator ×

Members

- CalculatorServlet :: HttpServlet
  - doGet(HttpServletRequest
  - doPost(HttpServletRequest
  - getServletInfo() : String
  - processRequest(HttpServlet

Notifications | Output × | HTTP Server Monitor

Calculator (run) × | Java DB Database Process × | GlassFish Server 3.1.2 ×

Fri Sep 05 11:34:48 EDT 2014 : Apache Derby Network Server - 10.8.1.2 - (1095077) started and ready to accept connections on port 1527

1:1   INS

2. Replace method **processRequest** with the following

```java
protected void processRequest(HttpServletRequest request, HttpServletResponse response)
throws ServletException, IOException {
    response.setContentType("text/html;charset=UTF-8");
    PrintWriter out = response.getWriter();
    out.println("<html>");
    out.println("<head>");
    out.println("<title>Calculator response</title>");
    out.println("</head>");
    out.println("<body>");

    String sfirst = request.getParameter("First");
    String ssecond = request.getParameter("Second");
    try {
        double firstn = Double.parseDouble(sfirst);
        double secondn = Double.parseDouble(ssecond);
        double result = 0;
        if (request.getParameter("add") != null) {
            result = firstn + secondn;
        } else if (request.getParameter("subtract") != null) {
            result = firstn - secondn;
        } else if (request.getParameter("multiply") != null) {
            result = firstn * secondn;
        } else if (request.getParameter("divide") != null) {
            result = firstn / secondn;
        }
        out.println("<h1>Result is: " + result + "</h1>");
    } catch (NumberFormatException e) {
        out.println("<h1>Wrong parameter types - enter numbers</h1>");
    }
    out.println("</body>");
    out.println("</html>");
    /* */
    out.close();
}
```

Build and Run Project

Select **Run** -> **Run Project** from the IDE tool bar (or Right-click on the project and select **Run Project**).

The calculator form should be displayed in a browser if not (and if BUILD IS SUCCESSFUL), go to URL http://localhost:8080/Calculator/.