

STRUTS FRAMEWORK COURSE

ACTIONS WITH STRUTS 2 FRAMEWORK



By the expert: Ubaldo Acosta

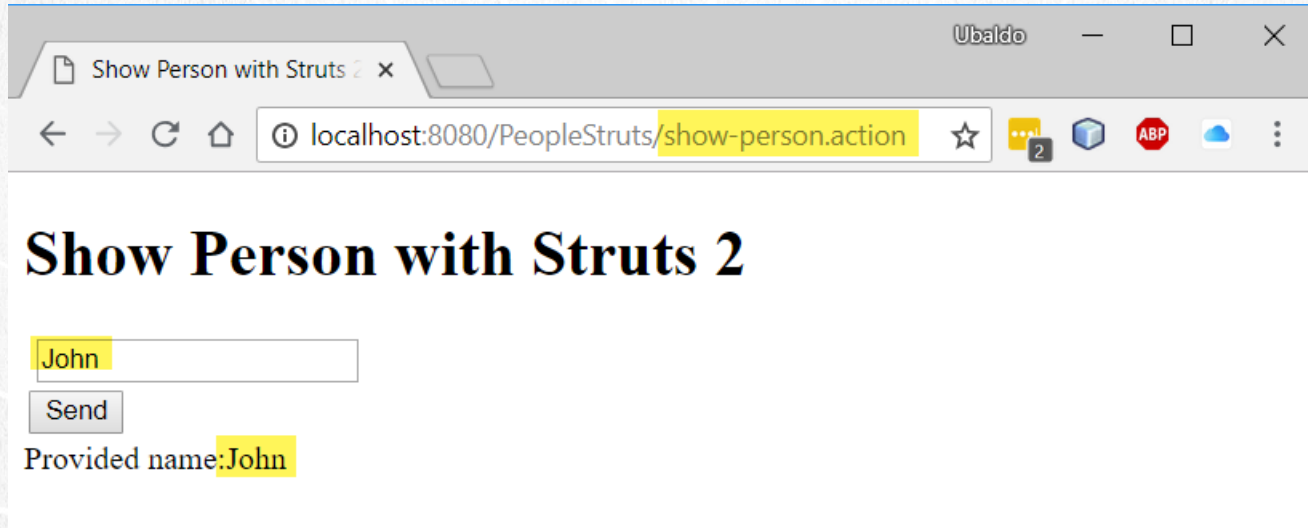


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EXERCISE OBJECTIVE

Create an application to implement the use of Actions with Struts 2 Framework. At the end we should observe the following:



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EXERCISE REQUIREMENT

Create an application that does the following:

- It must allow to capture an attribute name of type String.

The application will be called: PeopleStruts

- The path of the action and the view must map with: show-person
- According to the theme of conventions, the elements will remain as follows:
 - ✓ Path name: / show-person
 - ✓ Action name: ShowPersonAction.java
 - ✓ Name of the JSP: /WEB-INF/content/show-person.jsp

Note: Observe that the topic of conventions if the action contains two words (ShowPerson), then the path and the view separate each word by a hyphen: show-person



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EXERCISE REQUIREMENT

The action class called: ShowPersonAction.java must have the following characteristics:

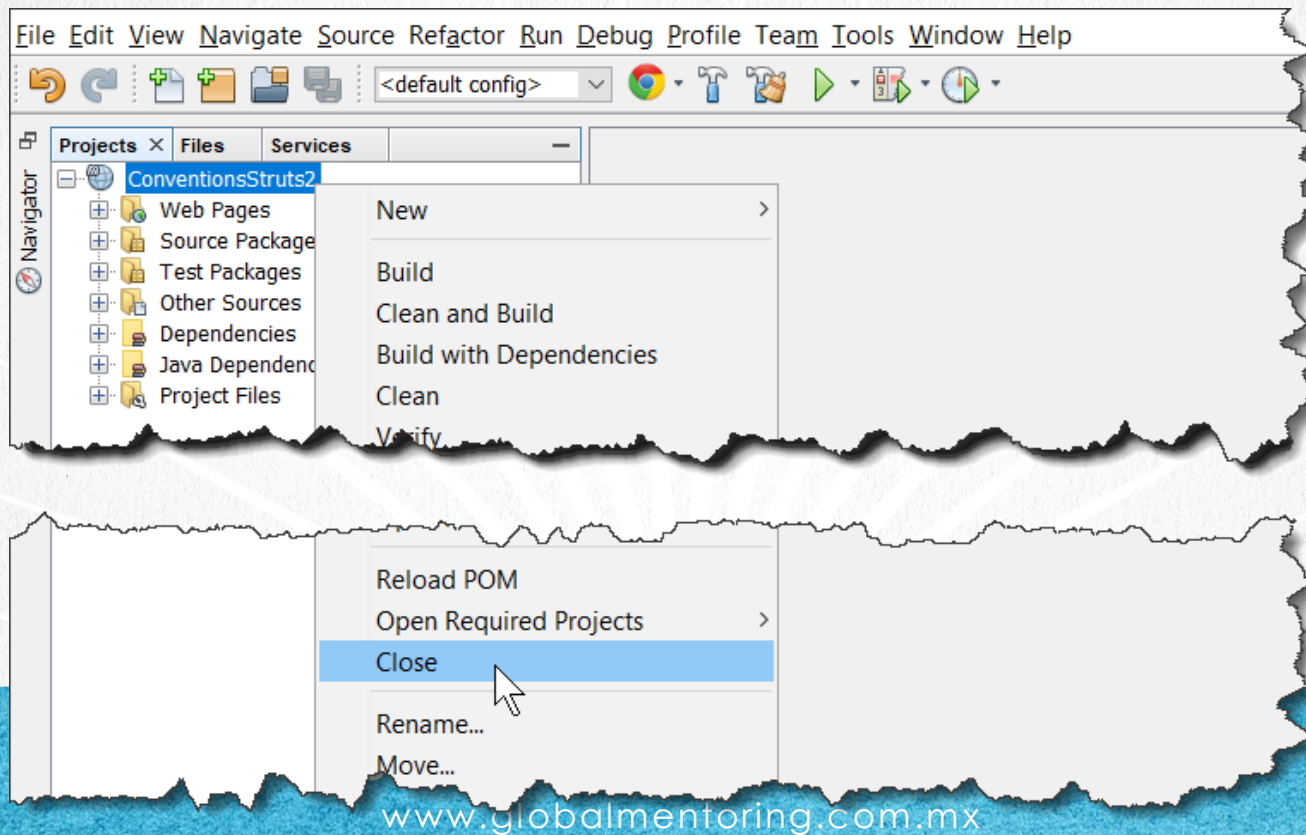
- Must extend from the ActionSupport class
- It must have a private attribute called person of type String, as well as its get/set attributes.
- The execute method only prints the name of the person received from the HTML form, and returns the SUCCESS constant.

The show-person.jsp view must contain the following:

- You must have the form to capture the name of the person, and also show the captured value of the form if there is one.

CLOSE THE PROJECTS THAT WE NO LONGER USE

- We close any other project that we no longer use, if we wish:



1. CREATE A NEW PROJECT

We are going to use Maven to create the Java Web project. The project will be called PeopleStruts, and it will be very similar to what we have worked previously, but now we will apply several more concepts.

Let's start with our exercise:

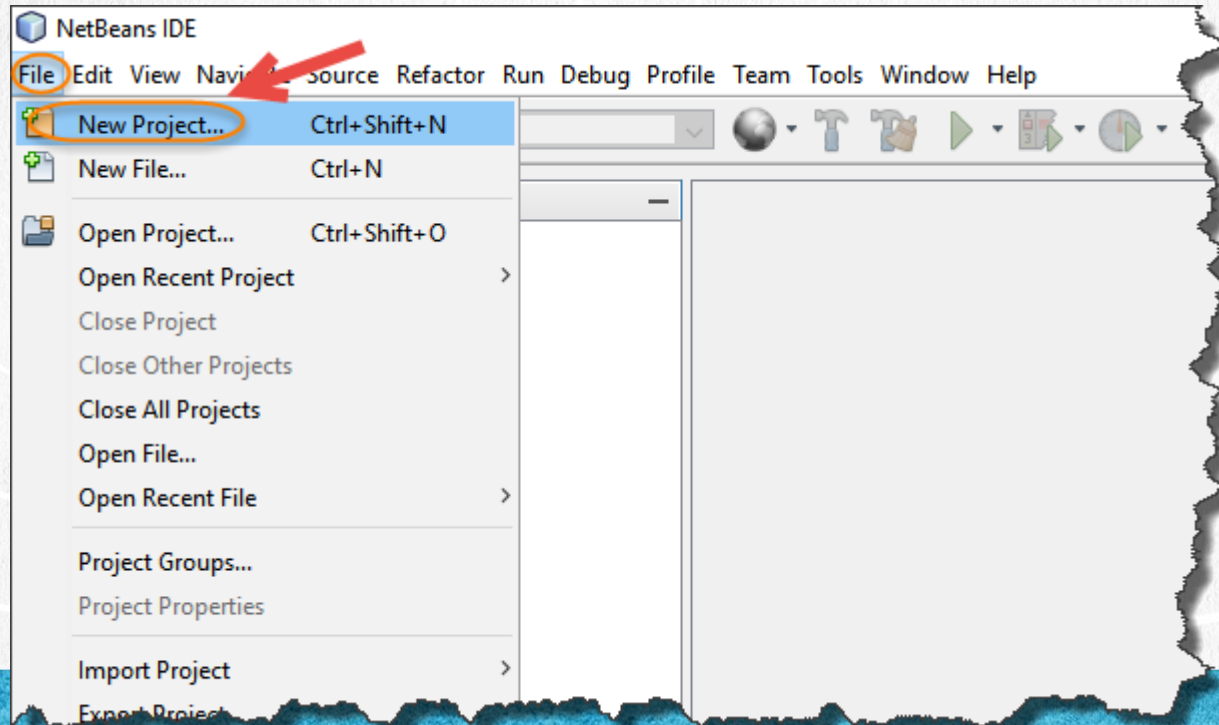


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1. CREATE A NEW PROJECT

We created our exercise called PeopleStruts:

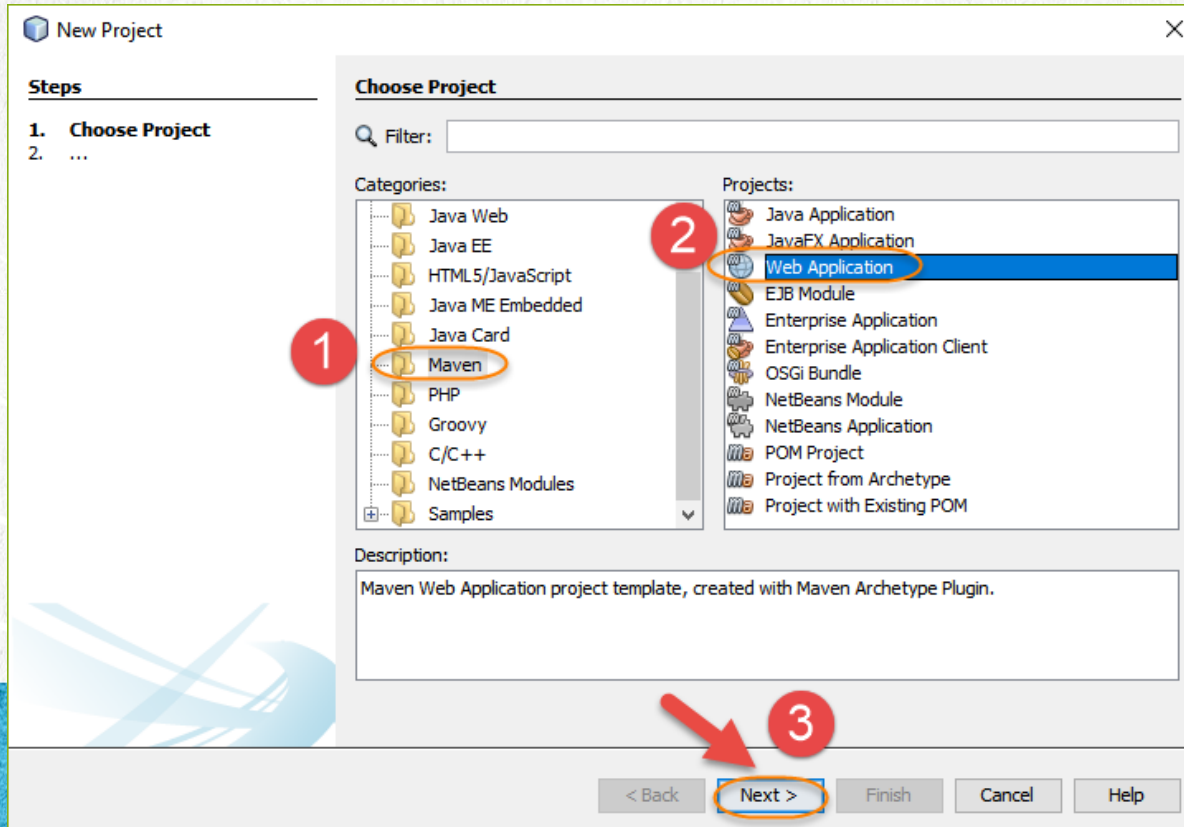


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1. CREATE A NEW PROJECT

- We create a new Java Maven project of type Web Application :



1. CREATE A NEW PROJECT

- We create a new Maven project:

New Web Application

Steps

1. Choose Project
2. **Name and Location**
3. Settings

Name and Location

Project Name: PeopleStruts

Project Location: C:\Courses\Struts\Lesson03 Browse...

Project Folder: C:\Courses\Struts\Lesson03\PeopleStruts

Artifact Id: PeopleStruts

Group Id: web

Version: 1

Package: (Optional)

< Back **Next >** Finish Cancel Help

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1. CREATE A NEW PROJECT

- We create a new Maven project :

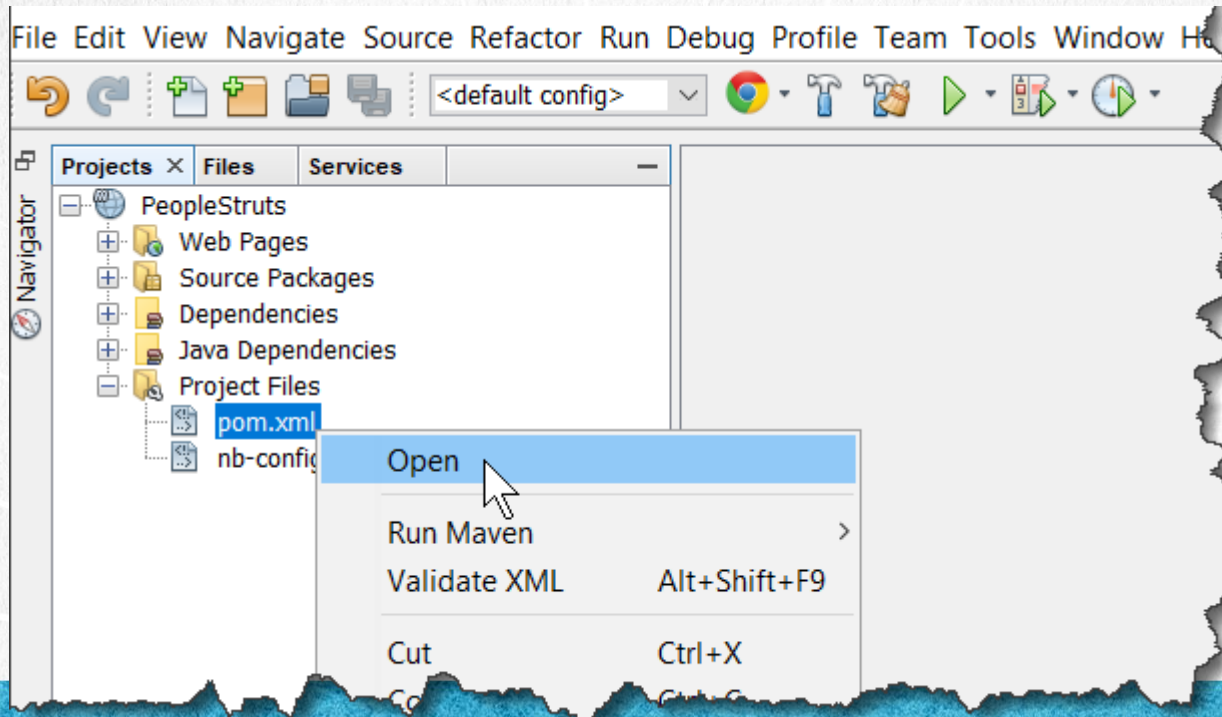
The screenshot shows the 'New Web Application' wizard with the 'Settings' step selected. The 'Steps' list on the left includes '1. Choose Project', '2. Name and Location', and '3. Settings'. The 'Settings' section contains two dropdown menus: 'Server' set to 'GlassFishServer' and 'Java EE Version' set to 'Java EE Web'. Both dropdowns are circled in orange. A red circle with the number '1' is next to the 'Server' dropdown, and a red circle with the number '2' is next to the 'Java EE Version' dropdown. At the bottom, the 'Finish' button is circled in orange, with a red circle containing the number '3' and a red arrow pointing to it. Other buttons at the bottom include '< Back', 'Next >', 'Cancel', and 'Help'.

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2. OPEN MAVEN'S POM.XML FILE

- The maven pom.xml file manages the Java libraries we will use:

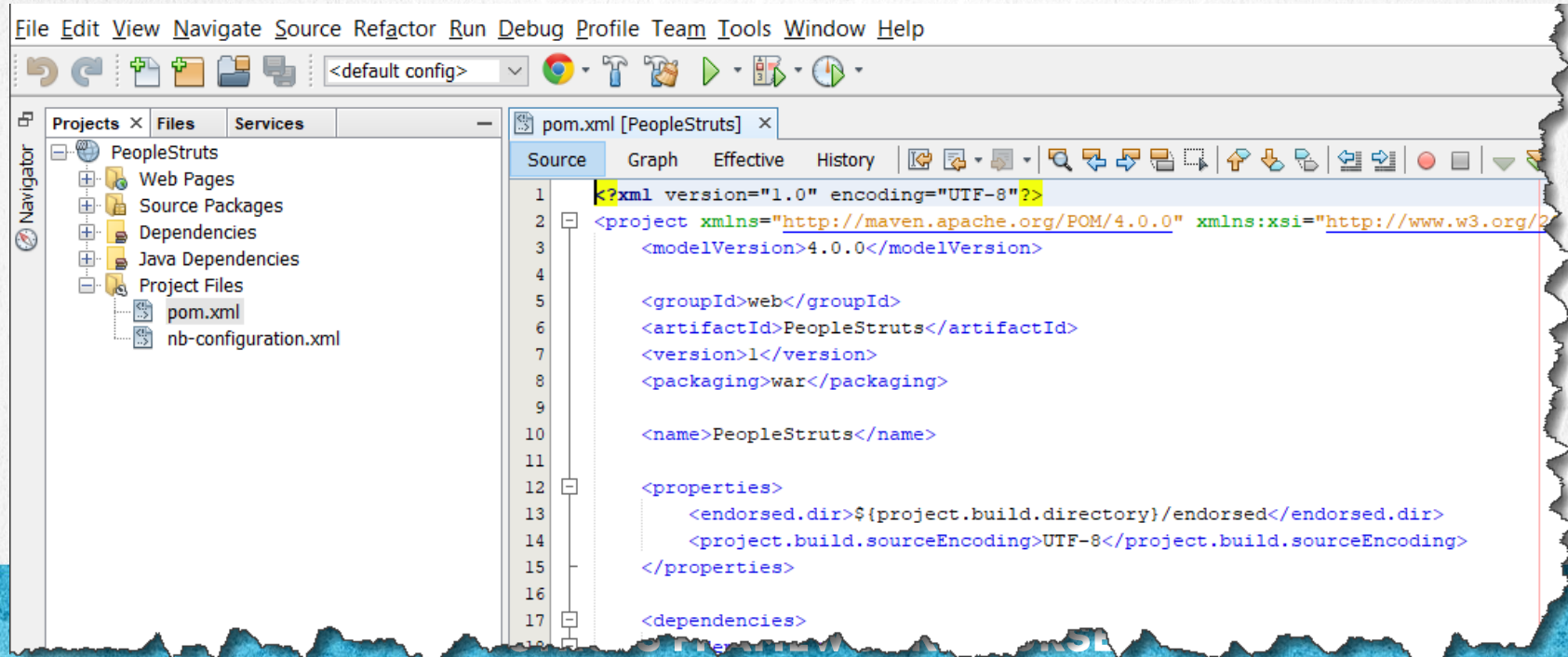


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2. OPEN MAVEN'S POM.XML FILE

- Once opened, we will modify the information completely of this file, with the information provided below:



3. MODIFY THE CODE

[pom.xml:](#)

[Click to download](#)

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
    <modelVersion>4.0.0</modelVersion>

    <groupId>web</groupId>
    <artifactId>PeopleStruts</artifactId>
    <version>1</version>
    <packaging>war</packaging>

    <name>PeopleStruts</name>

    <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
    </properties>

    <dependencies>
        <dependency>
            <groupId>javax</groupId>
            <artifactId>javaee-web-api</artifactId>
            <version>8.0</version>
            <scope>provided</scope>
        </dependency>
```

3. MODIFY THE CODE

[pom.xml:](#)

[Click to download](#)

```
<dependency>
  <groupId>org.apache.struts</groupId>
  <artifactId>struts2-core</artifactId>
  <version>2.5.17</version>
</dependency>
<dependency>
  <groupId>org.apache.logging.log4j</groupId>
  <artifactId>log4j-api</artifactId>
  <version>2.11.1</version>
</dependency>
<dependency>
  <groupId>org.apache.logging.log4j</groupId>
  <artifactId>log4j-core</artifactId>
  <version>2.11.1</version>
</dependency>
<dependency>
  <groupId>org.apache.struts</groupId>
  <artifactId>struts2-convention-plugin</artifactId>
  <version>2.5.17</version>
</dependency>
</dependencies>
```

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3. MODIFY THE CODE

[pom.xml:](#)

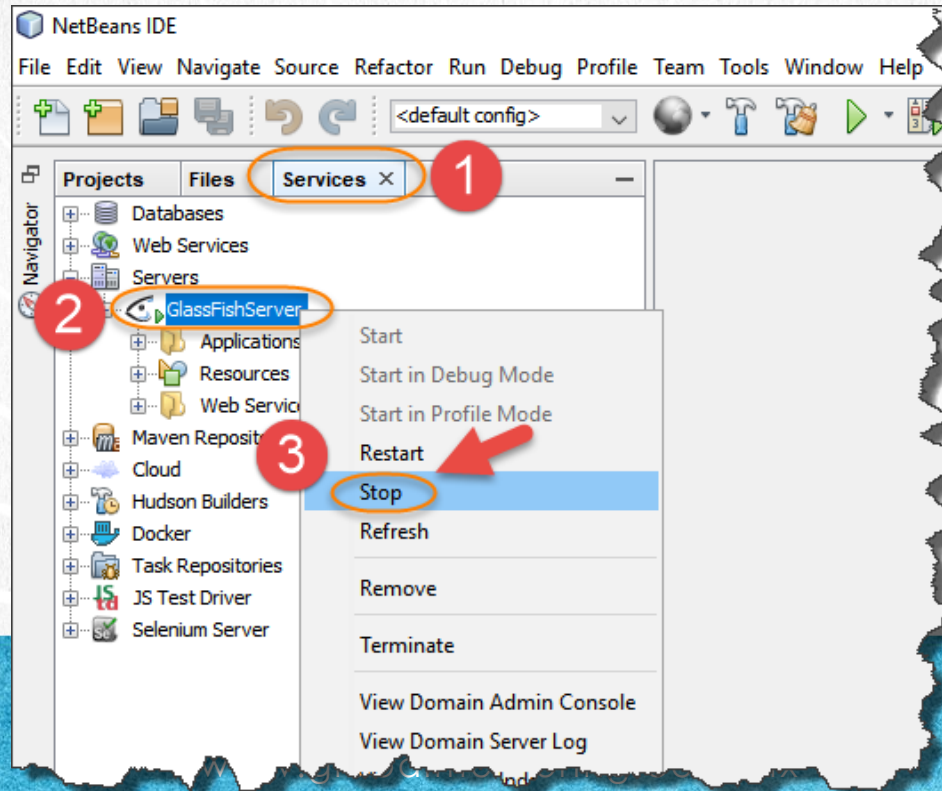
[Click to download](#)

```
<build>
  <plugins>
    <plugin>
      <groupId>org.apache.maven.plugins</groupId>
      <artifactId>maven-war-plugin</artifactId>
      <version>2.3</version>
      <configuration>
        <failOnMissingWebXml>false</failOnMissingWebXml>
      </configuration>
    </plugin>
    <plugin>
      <groupId>org.apache.maven.plugins</groupId>
      <artifactId>maven-compiler-plugin</artifactId>
      <version>3.7.0</version>
      <configuration>
        <source>1.8</source>
        <target>1.8</target>
      </configuration>
    </plugin>
  </plugins>
</build>

</project>
```

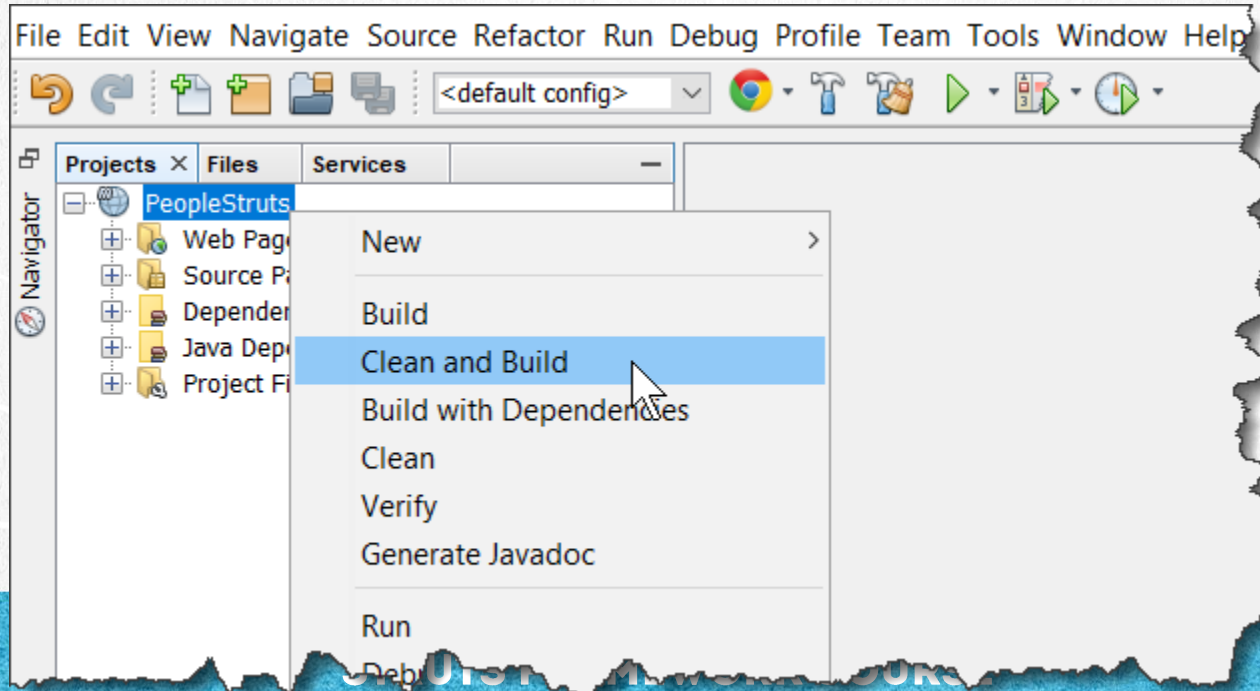
4. STOP GLASSFISH IF IT WAS STARTED

- Before doing Clean & Build of the project to download the new libraries, we verify that the Glassfish server is not started as there may be problems to do the Clean & build process if the server is started. This step is only verification :



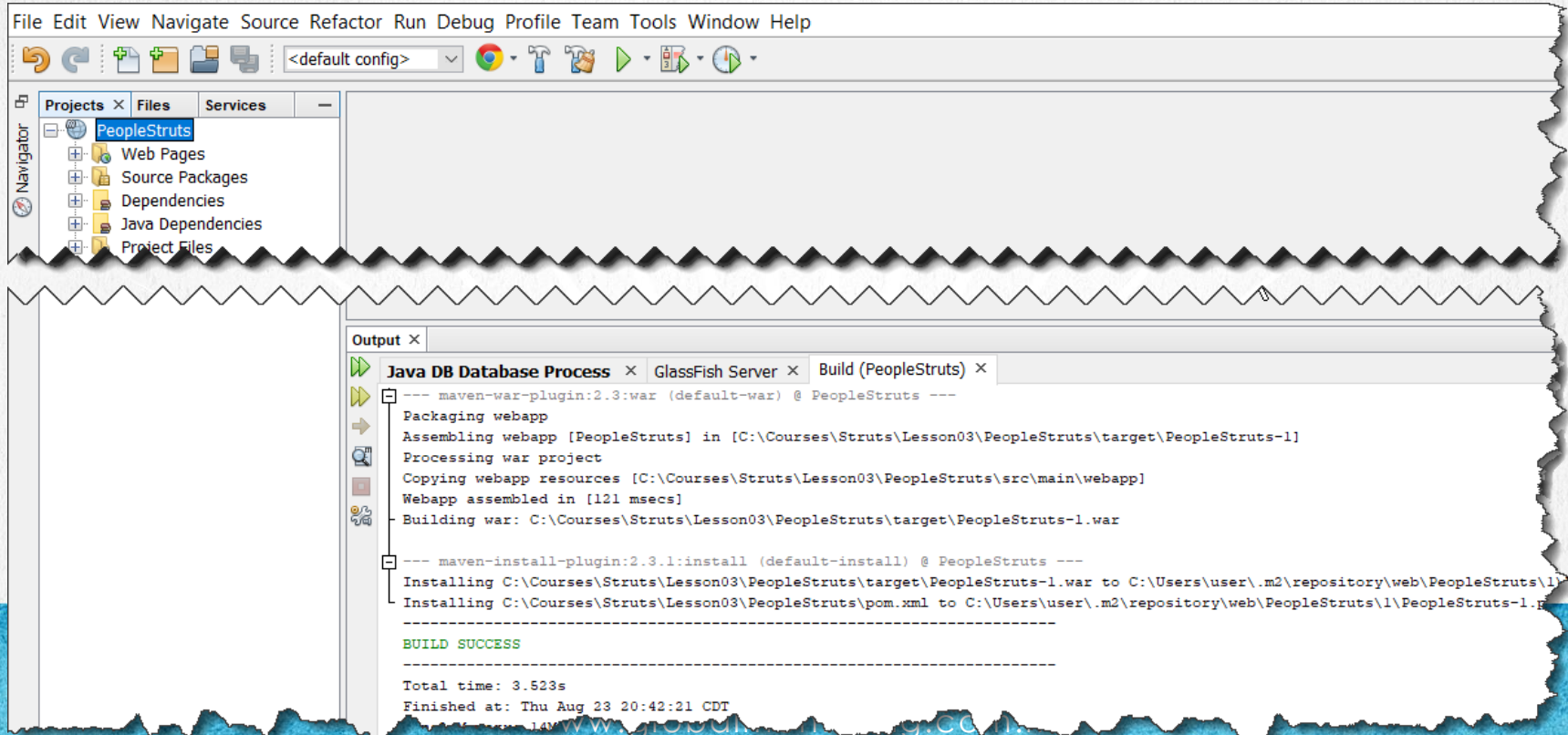
5. EXECUTE CLEAN & BUILD

- In order to download the new libraries, we make Clean & Build the project. If for some reason this process fails, you must disable any software such as antivirus, Windows defender or firewall during this process so that the download of Java .jar files is not prevented. Once finished, these services can be activated again. This process may take several minutes depending on your internet speed:



5. EXECUTE CLEAN & BUILD

- If you no longer had to download any library because you could already have all downloaded, the process is faster. In the end we should observe the following:



6. CREATE AN XML FILE

We are going to create the web.xml file below

This file is what allows us to join a Java Web application with the Struts framework, configuring the Struts filter in the web.xml file.

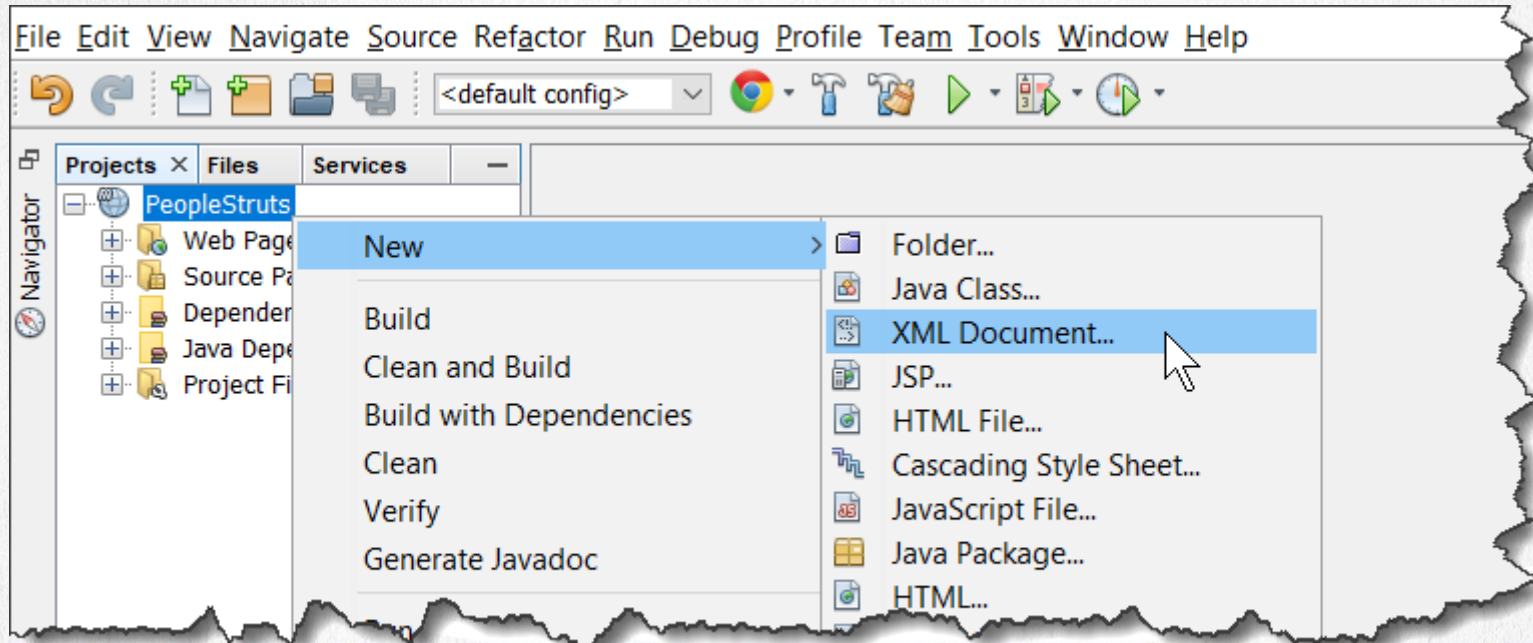


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6. CREATE AN XML FILE

- We create the web.xml file and add it to the WEB-INF folder as shown :



6. CREATE AN XML FILE

- The name of the file is web, it is not necessary to add the extension, it adds it in automatic the IDE since it is an XML type document. Finally we provide the route:

New XML Document

Steps

1. Choose File Type
- 2. Name and Location**
3. Select Document Type
4. ...

Name and Location

File Name:

Project:

Folder:

Created File:

6. CREATE AN XML FILE

- We select the indicated type and click on finish.

New File

Steps

1. Choose File Type
2. Name and Location
3. **Select Document Type**
4. ...

Select Document Type

Select the type of XML document you want to create based on your document structure, data types, and namespace requirements.

☒ **Well-formed Document**

☐ DTD-Constrained Document

☐ XML Schema-Constrained Document

Finish

7. MODIFY THE CODE

web.xml:

Click to download

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app version="4.0"
  xmlns="http://xmlns.jcp.org/xml/ns/javaee"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://xmlns.jcp.org/xml/ns/javaee
http://xmlns.jcp.org/xml/ns/javaee/web-app_4_0.xsd">

  <filter>
    <filter-name>struts2</filter-name>
    <filter-class>org.apache.struts2.dispatcher.filter.StrutsPrepareAndExecuteFilter</filter-class>
  </filter>
  <filter-mapping>
    <filter-name>struts2</filter-name>
    <url-pattern>/*</url-pattern>
  </filter-mapping>

</web-app>
```

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8. MODIFY THE INDEX.HTML FILE

In automatic the IDE adds a file called index.html. However, if this file is not created we must add it to the project at the root level of Web Pages.

The index.html file really is not yet part of the Struts framework, however it will be the entry point for the Struts framework to be executed, since from this file we will indicate which action we want to execute.

In this exercise the path that we will use will be: [show-person](#)



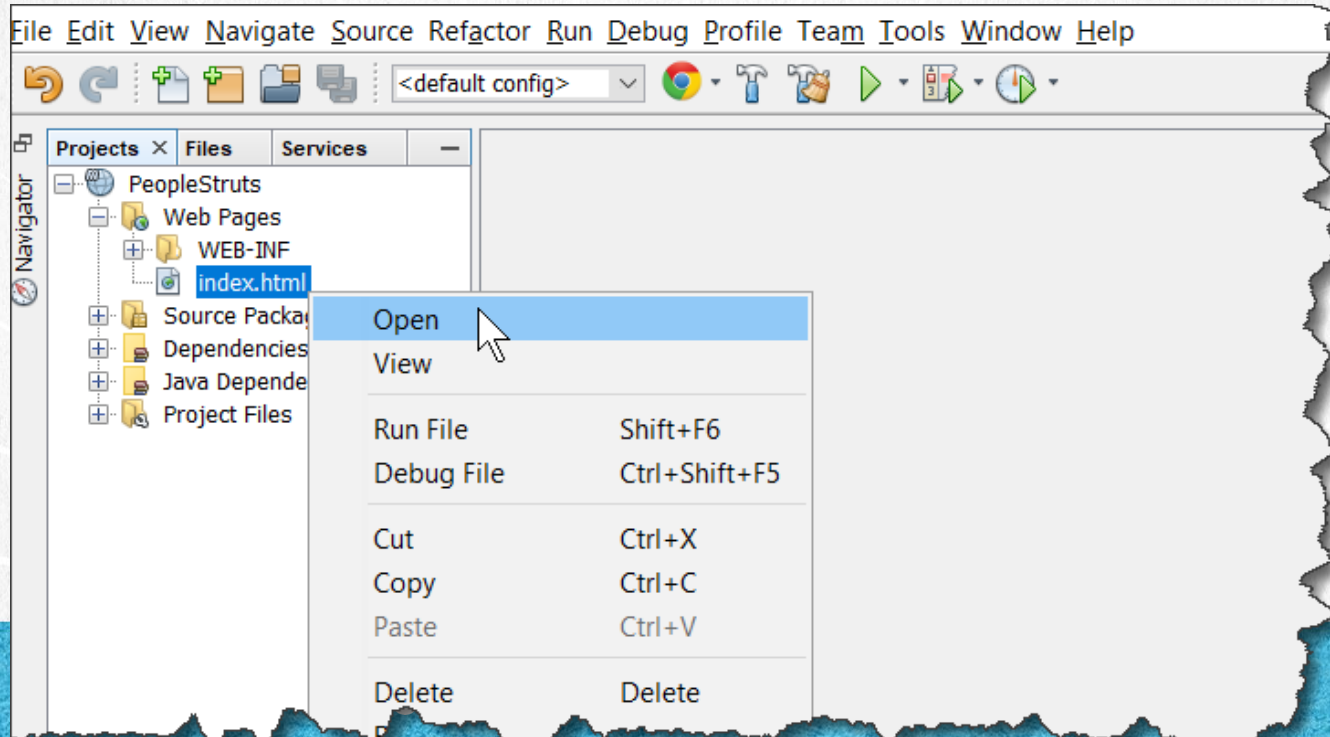
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8. MODIFY THE INDEX.HTML FILE

- Modificamos el archivo index.html. En caso de que este archivo no exista, lo creamos a nivel raíz de la carpeta Web Pages según se muestra:



8. MODIFY THE FILE

[index.html:](#)

[Click to download](#)

```
<!DOCTYPE html>
<html>
  <head>
    <title>Home</title>
    <meta charset="UTF-8">
  </head>
  <body>
    <a href="show-person">Go to show person</a>
  </body>
</html>
```

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9. CREATE A NEW JAVA CLASS

The ShowPersonAction.java class that we are going to create next will act as Controller (Action) and Model (Bean).

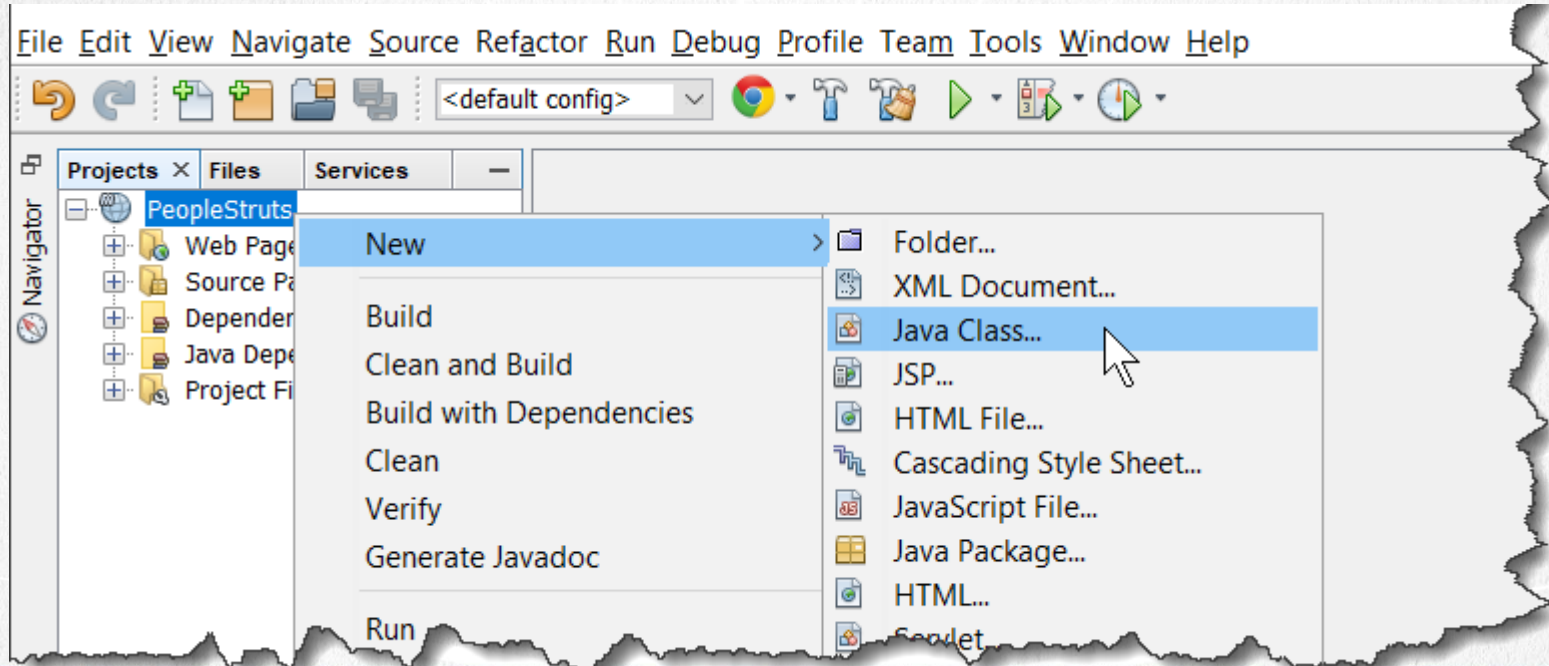
We are going to extend the ActionSupport class and to overwrite the execute method. Although as we have commented previously, to create an action in Struts 2 it is not necessary to extend any kind of mandatory way, however we will see in later exercises that has several benefits to extend from the ActionSupport class, so in most cases it is convenient to do extends of this class when we are creating our Action type classes in Struts 2.

On the other hand, the Model will only add at the moment an attribute called name of type String.

Recall that we must respect the conventions of Struts2, so this class must be within a package that contains the word: struts, struts2, action or actions, also, the Java class must end with the word Action.

9. CREATE A NEW JAVA CLASS

- Create the ShowPersonAction.java class:



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9. CREATE A NEW JAVA CLASS

- Create the ShowPersonAction.java class:

New Java Class

Steps

1. Choose File Type
2. **Name and Location**

Name and Location

Class Name: ShowPersonAction

Project: PeopleStruts

Location: Source Packages

Package: web.actions

Created File: C:\Courses\Struts\Lesson03\PeopleStruts\src\main\java\web\actions\ShowPersonAction.java

< Back Next > **Finish** Cancel Help

10. MODIFY THE CODE

ShowPersonAction.java:

Click to download

```
package web.actions;

import com.opensymphony.xwork2.ActionSupport;
import org.apache.logging.log4j.*;

public class ShowPersonAction extends ActionSupport {

    private String name;

    Logger log = LogManager.getLogger(ShowPersonAction.class);

    @Override
    public String execute() {
        log.info("The name is:" + this.name);
        return SUCCESS;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }
}
```

11. CREATE A NEW JSP

Now we create the file: show-person.jsp. Remember that this name corresponds to the path that is going to be used to call the corresponding action (ShowPersonaAction.java), so we separated by a hyphen each word of the class of type Action.

We must also deposit this JSP in the folder [/WEB-INF/content](#) as we have seen in the Struts 2 conventions topic.

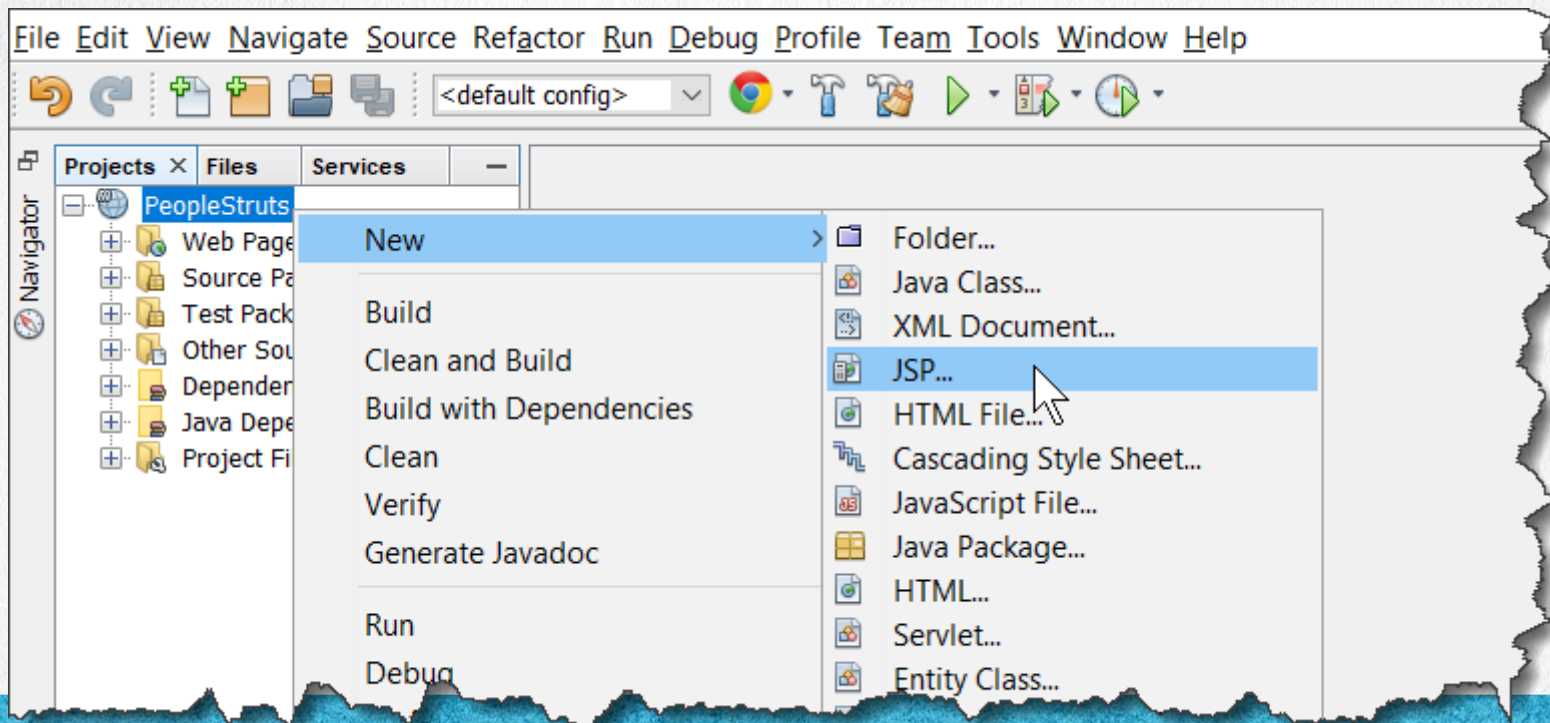


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11. CREATE A NEW JSP

- Create a new show-person.jsp file:



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11. CREATE A NEW JSP

- We create the file show-person.jsp in the path shown:

New JSP

Steps

1. Choose File Type
2. **Name and Location**

Name and Location

File Name: show-person

Project: PeopleStruts

Location: Web Pages

Folder: WEB-INF\content Browse...

Created File: C:\Courses\Struts\Lesson03\PeopleStruts\src\main\webapp\WEB-INF\content\show-person.jsp

Options:

☒ JSP File (Standard Syntax) ☐ Create as a JSP Segment

☐ JSP Document (XML Syntax)

Description:

A JSP file using JSP standard syntax.

< Back Next > **Finish** Cancel Help

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12. MODIFY THE CODE

[show-person.jsp:](#)

[Click to download](#)

```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib prefix="s" uri="/struts-tags" %>
<!DOCTYPE html>
<html>
  <head>
    <title>Show Person with Struts 2</title>
  </head>
  <body>
    <!--Form Struts 2-->
    <h1>Show Person with Struts 2</h1>
    <s:form>
      <s:textfield name="name" />
      <s:submit value="Send" />
    </s:form>

    <!--We display the value of the name attribute of the Action class-->
    <div>Provided name:<s:property value="name" /></div>
  </body>
</html>
```


13. CREATE THE LOG4J2.XML FILE

We create a log4j2.xml file. The log4j API allows us to manage the log or log of a Java application in a simpler way.

We place this file in the resource path of the maven project. If maven is not used then the file must be deposited at the root level of the Java code src.

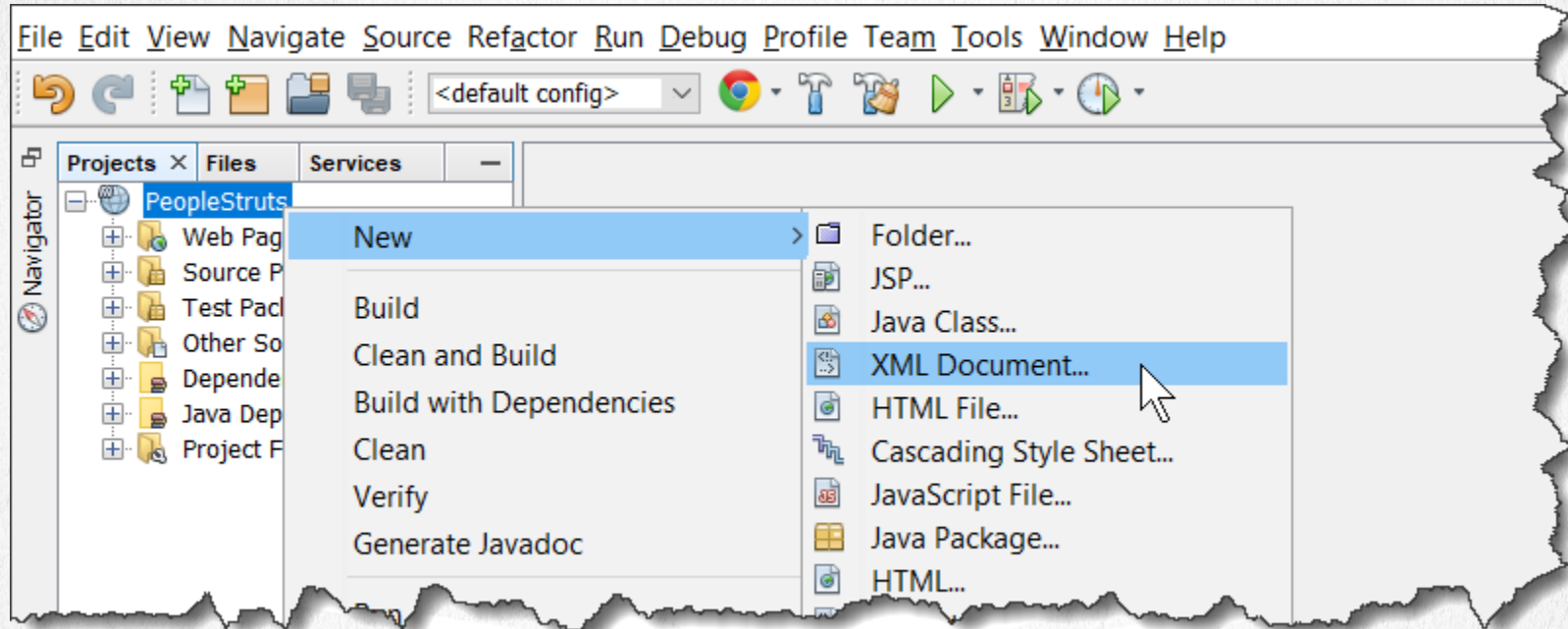


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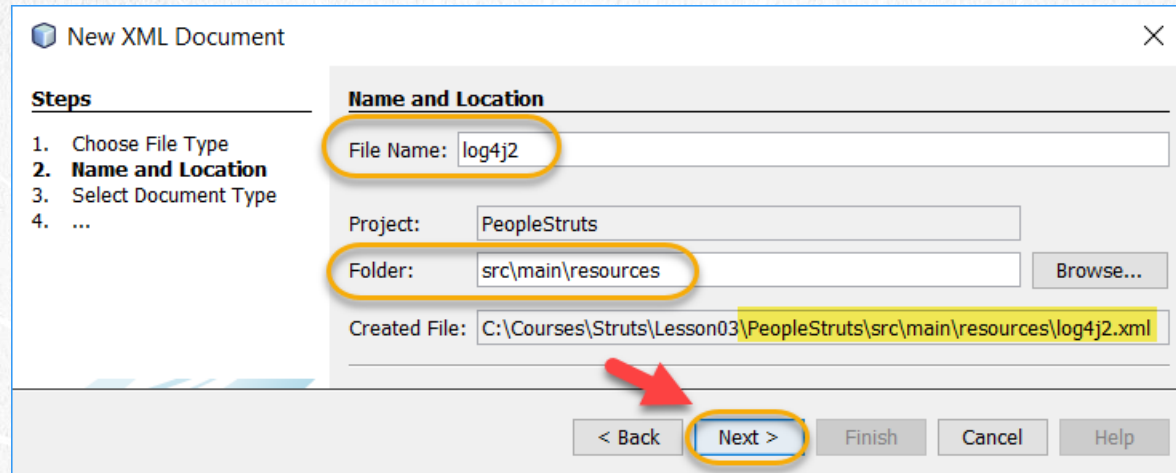
13. CREATE THE LOG4J2.XML FILE

- We create the log4j2.xml file as follows :



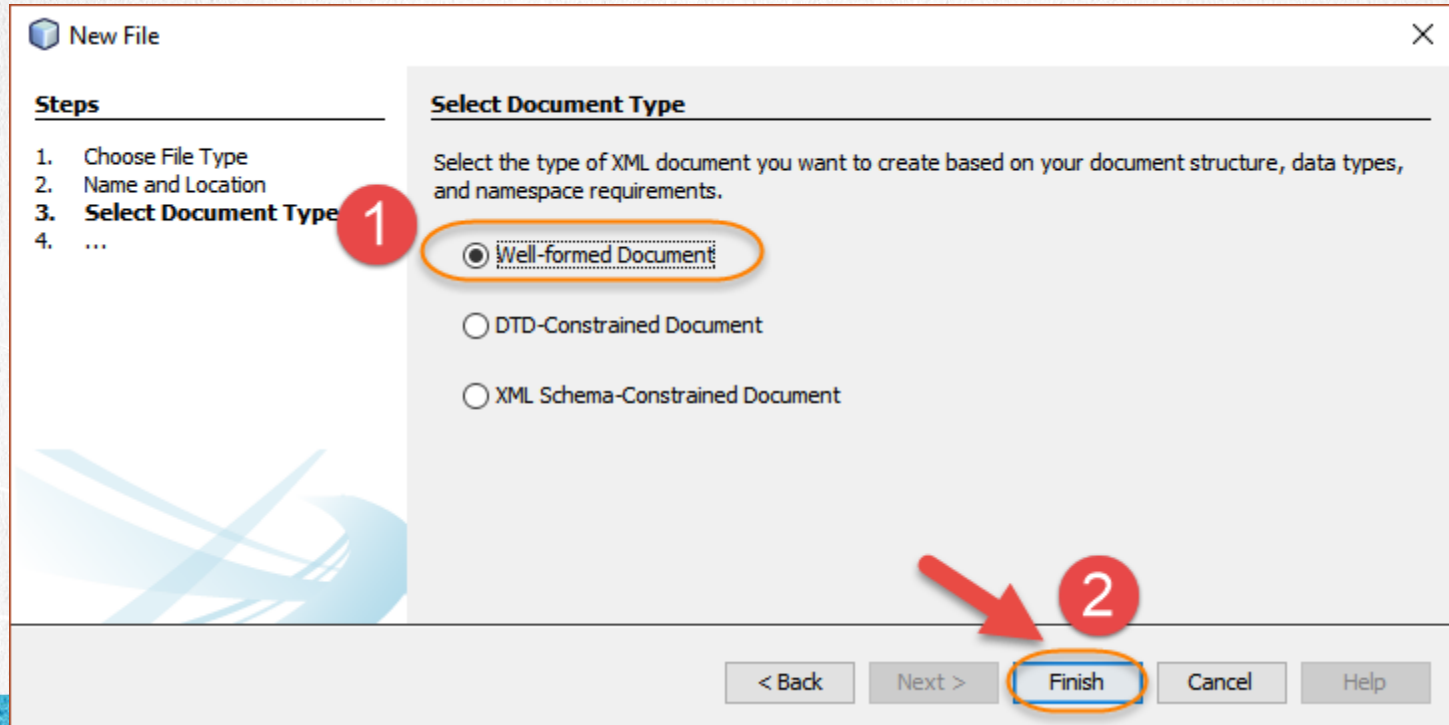
13. CREATE THE LOG4J2.XML FILE

- We deposit the file in the resources folder as shown:



13. CREATE THE LOG4J2.XML FILE

- We select the option shown:



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14. MODIFY THE CODE

log4j2.xml:

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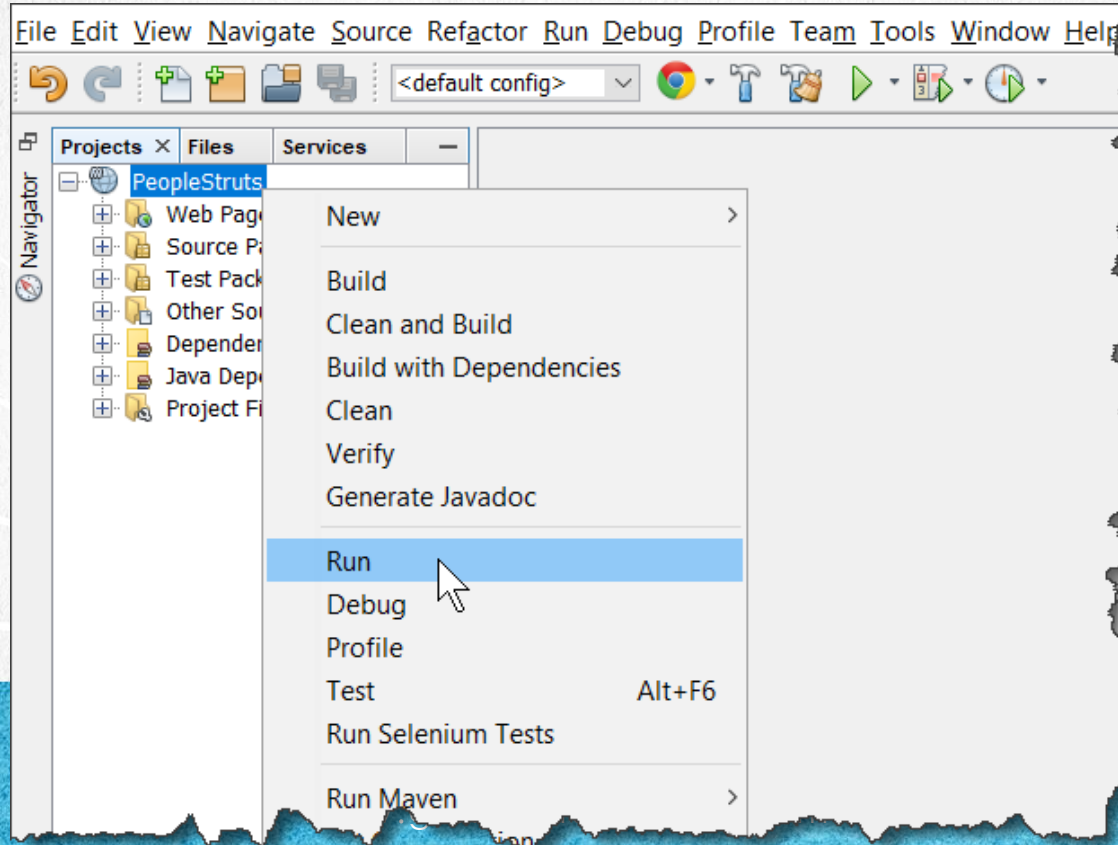
```
<?xml version="1.0" encoding="UTF-8"?>
<Configuration>
  <Appenders>
    <Console name="STDOUT" target="SYSTEM_OUT">
      <PatternLayout pattern="%F:%L) - %m%n"/>
    </Console>
  </Appenders>
  <Loggers>
    <Logger name="com.opensymphony.xwork2" level="info"/>
    <Logger name="org.apache.struts2" level="info"/>
    <Root level="info">
      <AppenderRef ref="STDOUT"/>
    </Root>
  </Loggers>
</Configuration>
```

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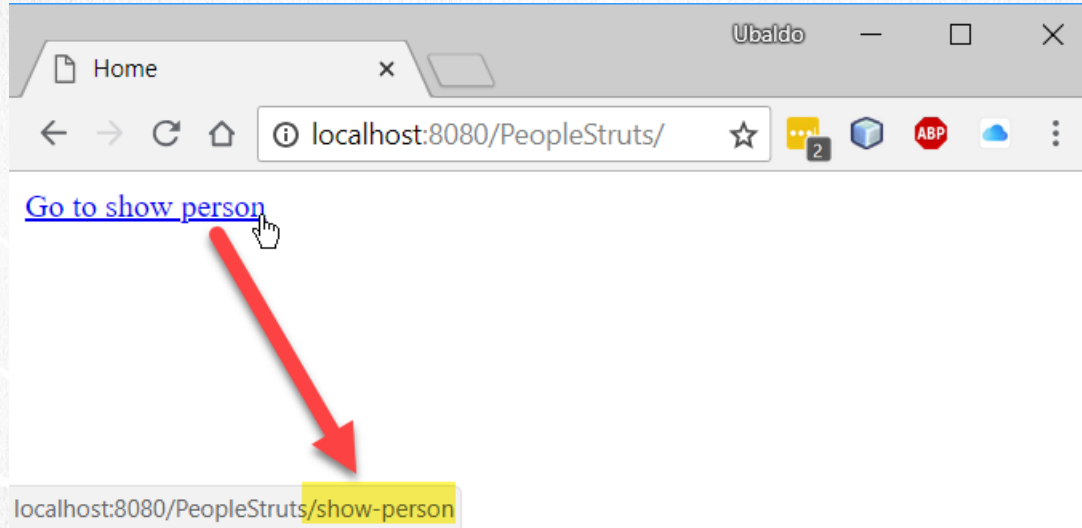
15. EXECUTE THE APPLICATION

- Execute the application as follows:



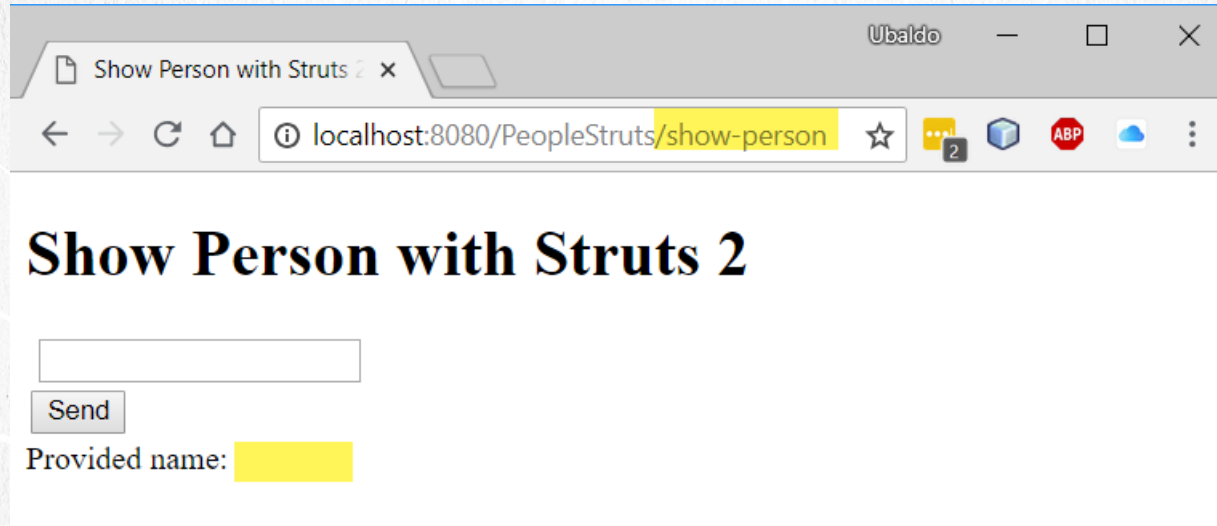
15. EXECUTE THE APPLICATION

- Execute the application as follows :



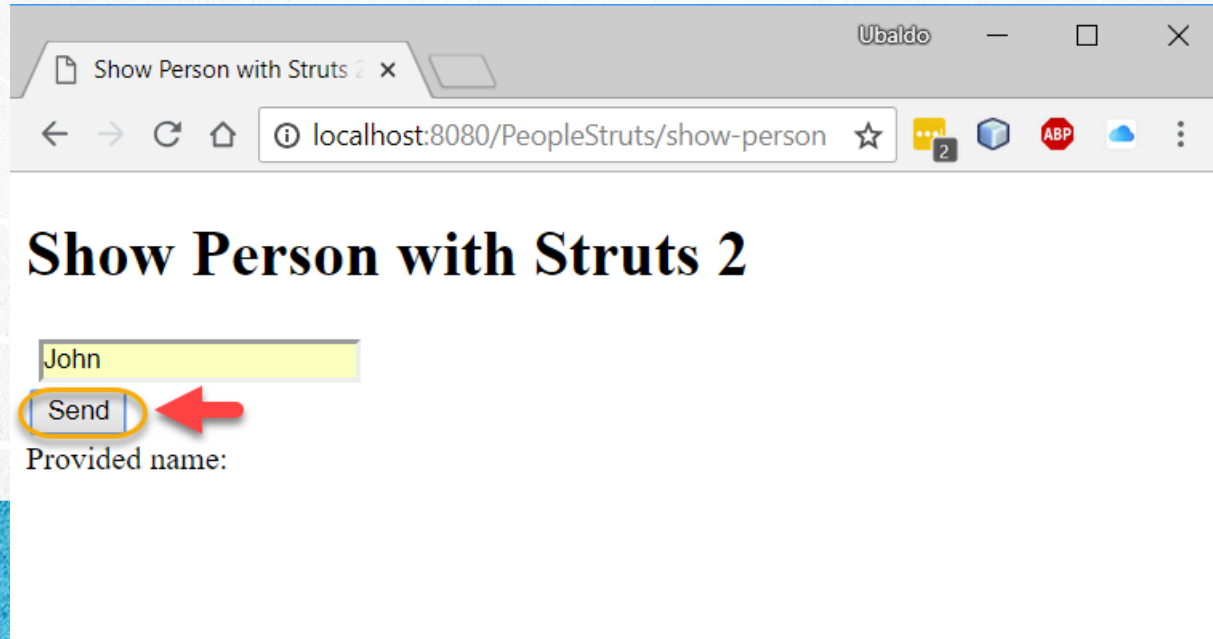
15. EXECUTE THE APPLICATION

- We observe the form initially. No value is initially displayed in the provided name.



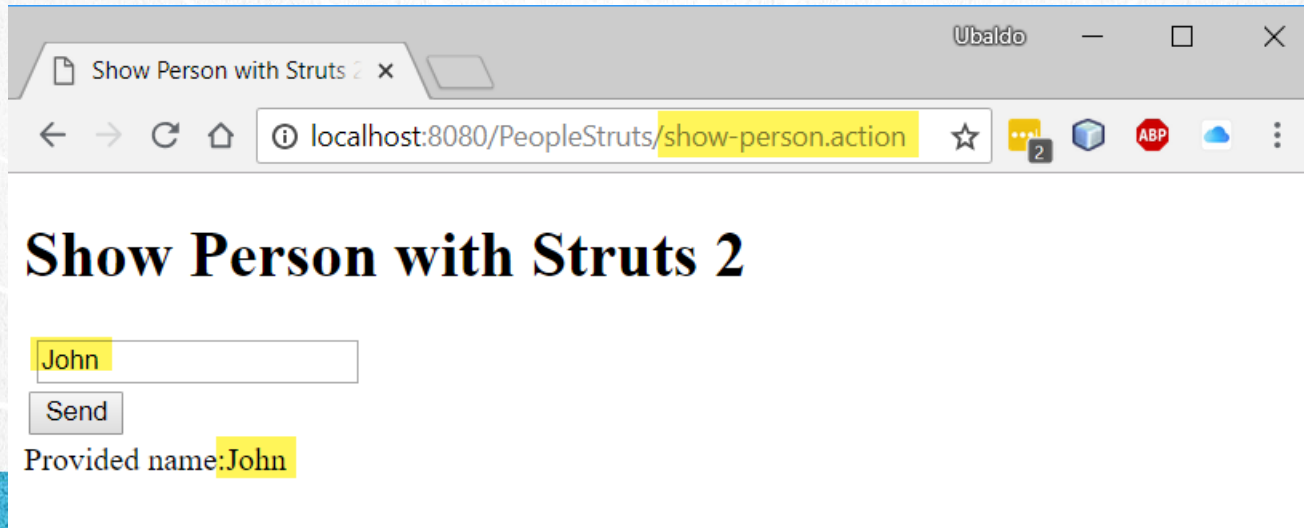
15. EXECUTE THE APPLICATION

- We provide some value in the field of the form, eg: John, and send it to the server. Because we are using the Struts conventions, the URL that will be executed is:
<http://localhost:8080/PeopleStruts/show-person.action>
- The extension .action that is added to the end is the default extension of Struts 2.



15. EXECUTE THE APPLICATION

- We see the result of having sent the form and the URL in the browser that sent the Send button of the form:
- <http://localhost:8080/PersonasStruts/show-person.action>
- We can see that a value is already shown in the text of "Provided Name: John". With this we verify that the Action class is running again, but now it has already processed the sent value of the form.



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FINAL RECOMMENDATIONS

If for some reason the exercise fails, several things can be done to correct it:

- Stop the Glassfish server
- Make a Clean & Build project to have the most recent version compiled
- Restart the project (deploy the project to the server again)

If the above does not work, you can try loading the resolved project which is 100% functional and rule out configuration problems in your environment or any other code error.

The configuration by conventions of Struts 2, is very sensitive, in such a way that everything must be written as it was specified in the exercise, since any change in the names will cause that the exercise is not executed correctly. However, the resolved project is 100% functional, so you can support these projects at all times.

EXERCISE CONCLUSION

With this exercise we have created an application that uses an action that extends from the ActionSupport class and we have processed a parameter sent from a Struts 2 form.

This application already includes an HTML form with which we are beginning to process information through our class of type Action, and the JSP shows the value received from the HTML form.

The ActionSupport class of which we extended has several methods that we will use in later exercises. For now we have the application ready to perform several more tasks.



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ONLINE COURSE

STRUTS 2 FRAMEWORK

By: Eng. Ubaldo Acosta



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