HELLO WORLD WITH STRUTS 2 FRAMEWORK

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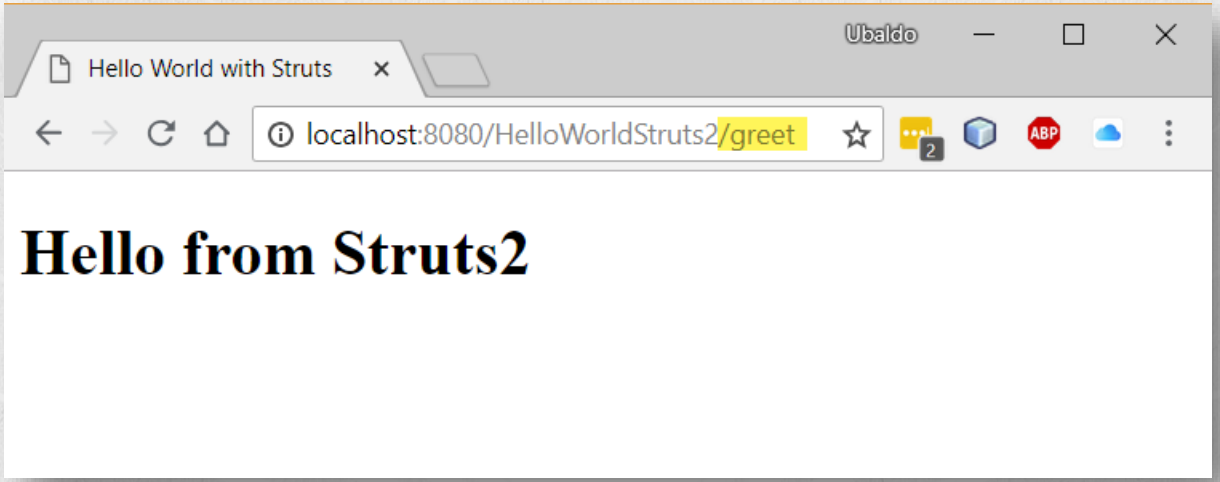
Global Mentoring

JAVA ONLINE COURSES UNIVERSITY

EXERCISE OBJECTIVE

Create an application to make a HelloWorld with Struts 2 Framework. At the end we should observe the following:



1. CREATE A NEW PROJECT

We are going to use Maven to create the Java Web project. Maven allows us, among other things, to facilitate the construction process of our Java projects, as well as to simplify the administration of the Java libraries that we use in our projects. And because the framework of Struts 2 uses several libraries, we will take advantage of the features that Maven offers us to create, configure and build our project, including the administration of the libraries that we will use in our projects of our course.

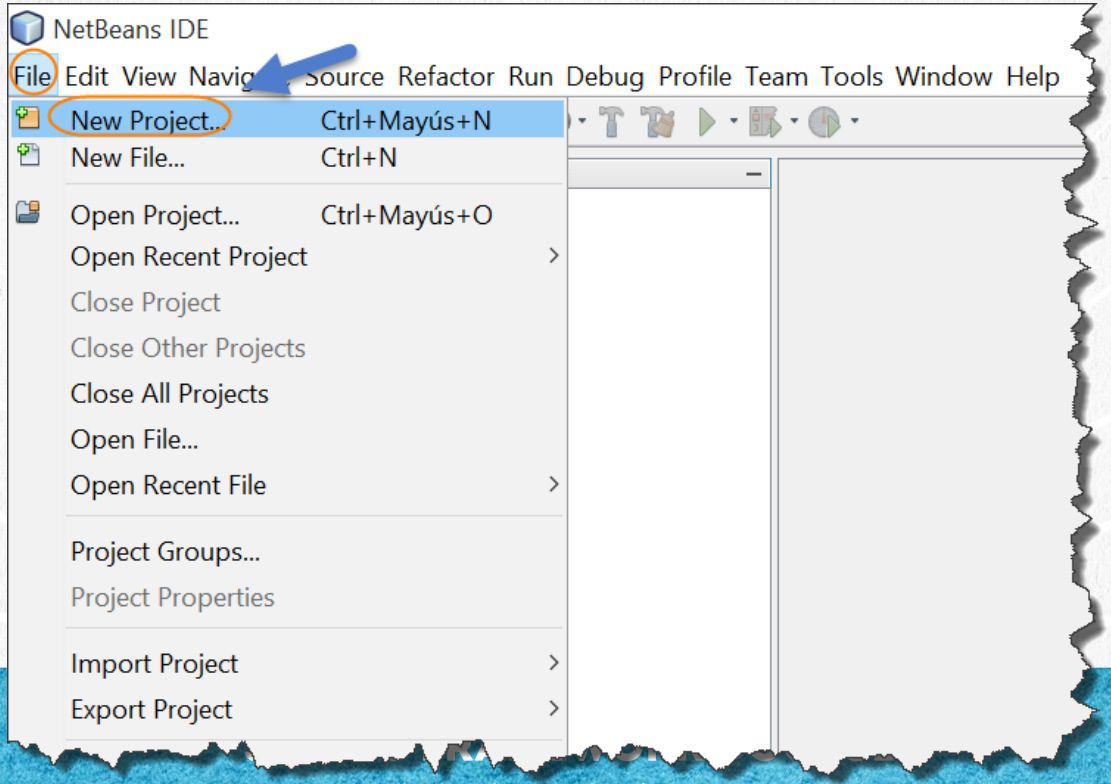
Using Maven also has the advantage that it is possible to open these projects in other IDE's, since when creating a project using Maven, it is to use a standard in the creation of Java projects.

For more information about Maven, you can consult the following link:

https://maven.apache.org/

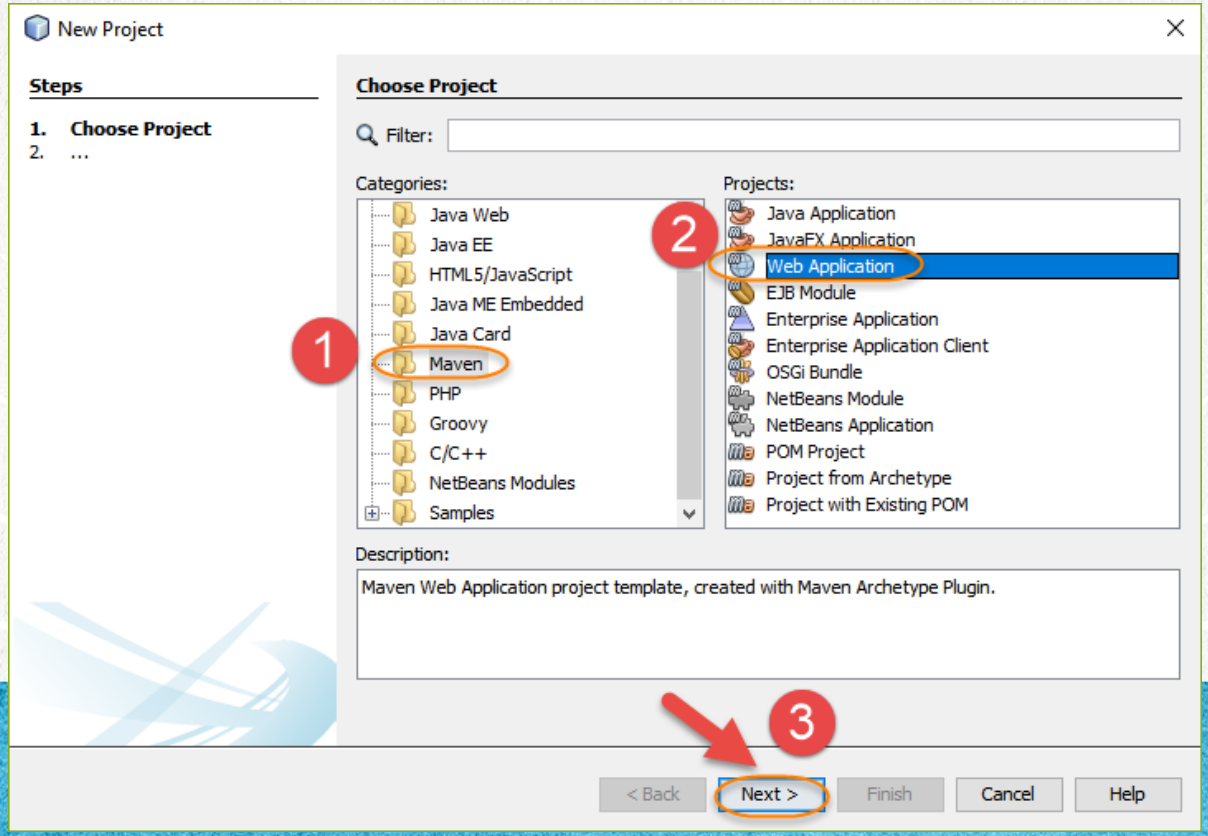
1. CREATE A NEW PROJECT

- Create a new project:



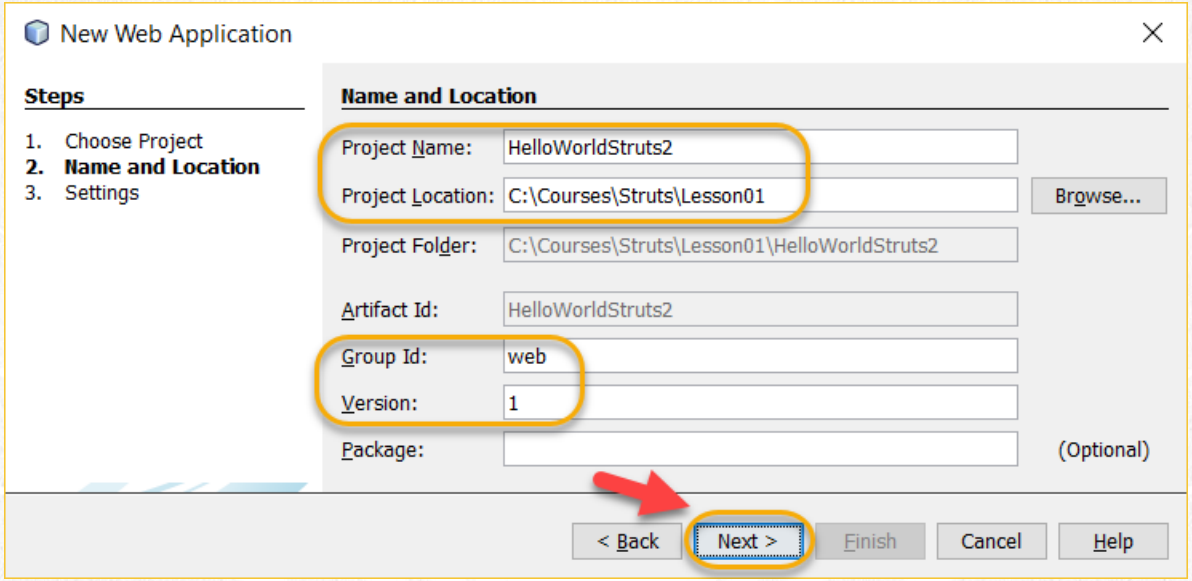
1. CREATE A NEW PROJECT

- Create a new maven Project, selecting Web Application:



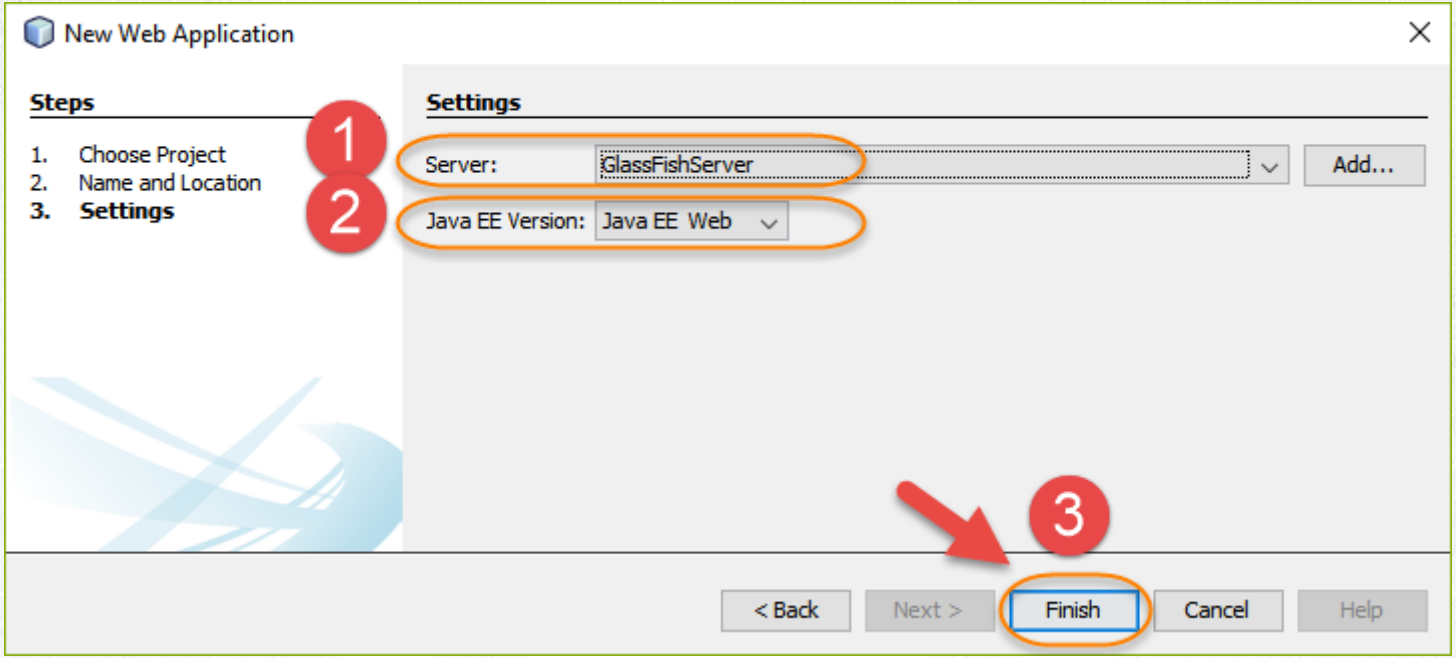
1. CREATE A NEW PROJECT

- Create a new project:



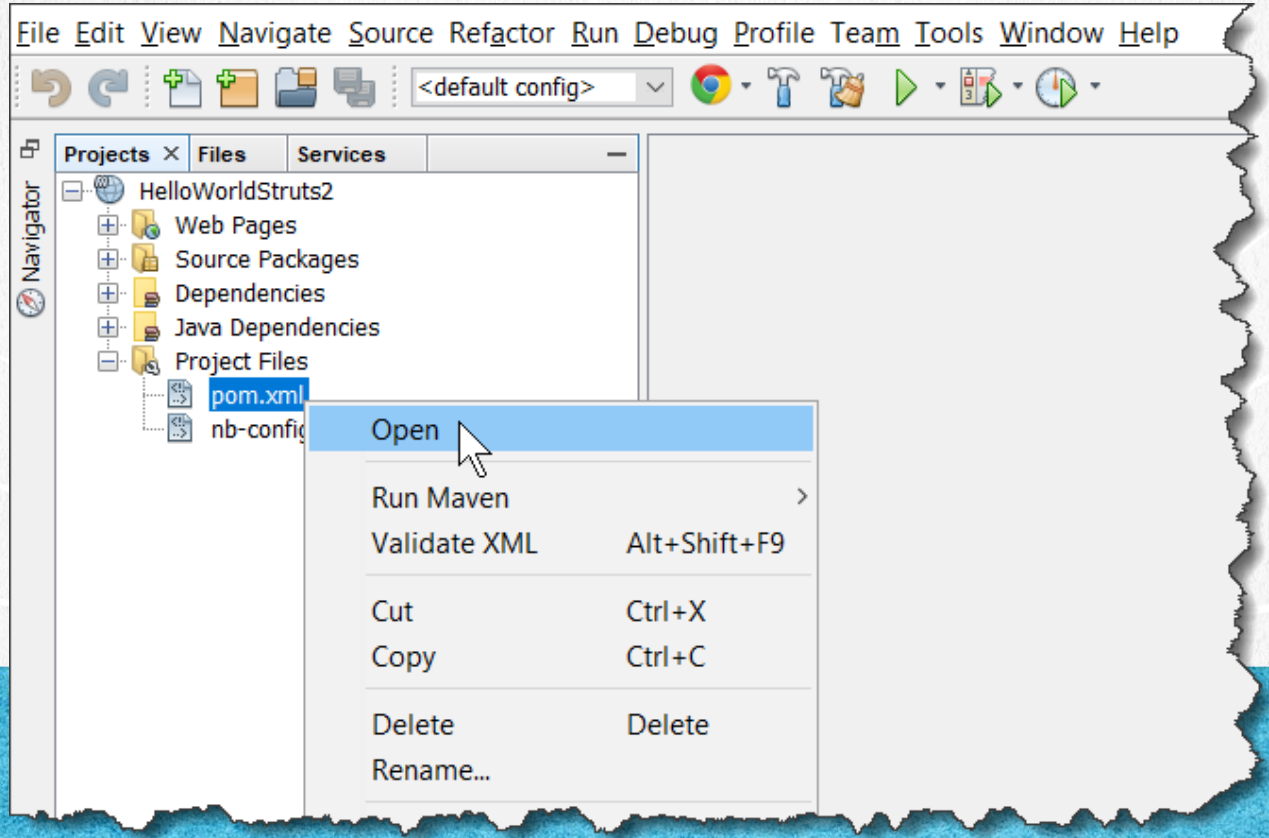
1. CREATE A NEW PROJECT

- Create a new project:



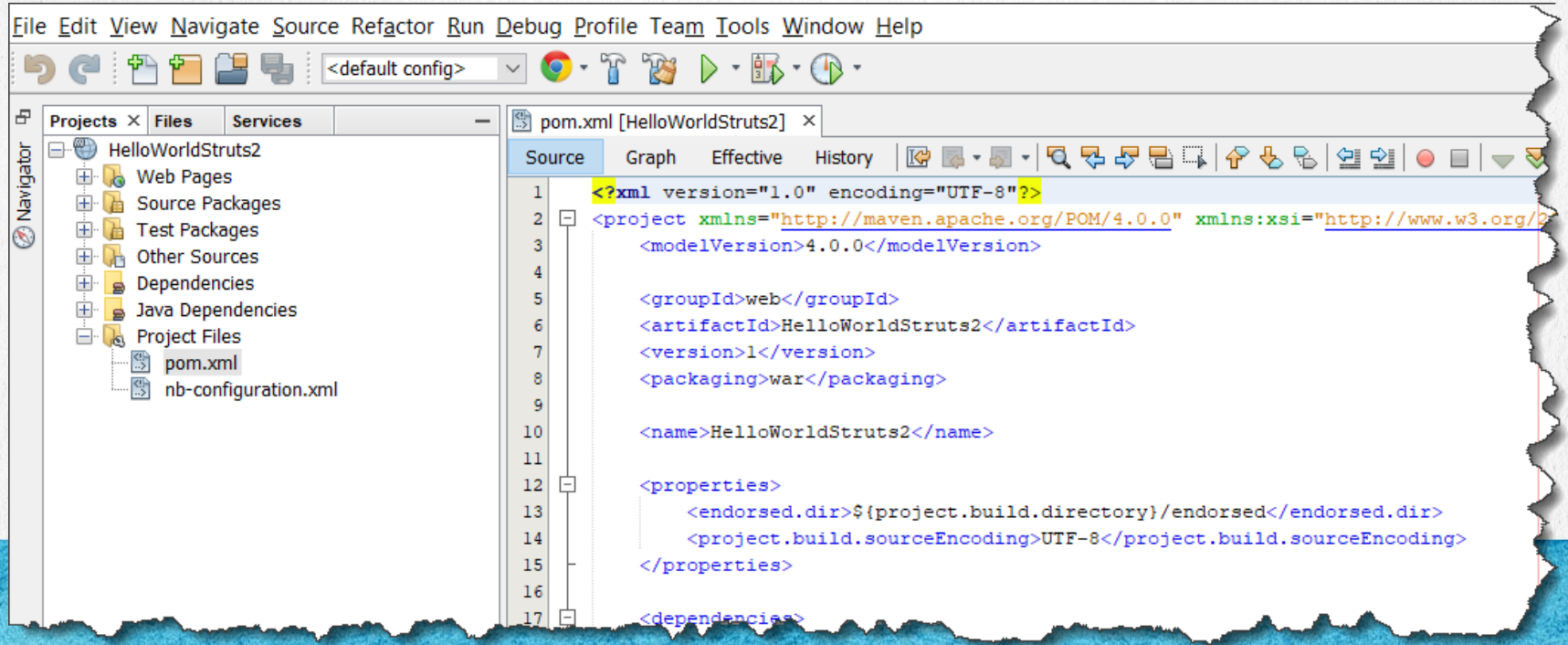
2. OPEN THE POM.XML MAVEN FILE

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



2. WE 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:

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```
<?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>HelloWorldStruts2</artifactId>
    <version>1</version>
    <packaging>war</packaging>

    <name>HelloWorldStruts2</name>

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

3. MODIFY THE CODE

pom.xml:

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

3. MODIFY THE CODE

pom.xml:

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```
    <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>
```

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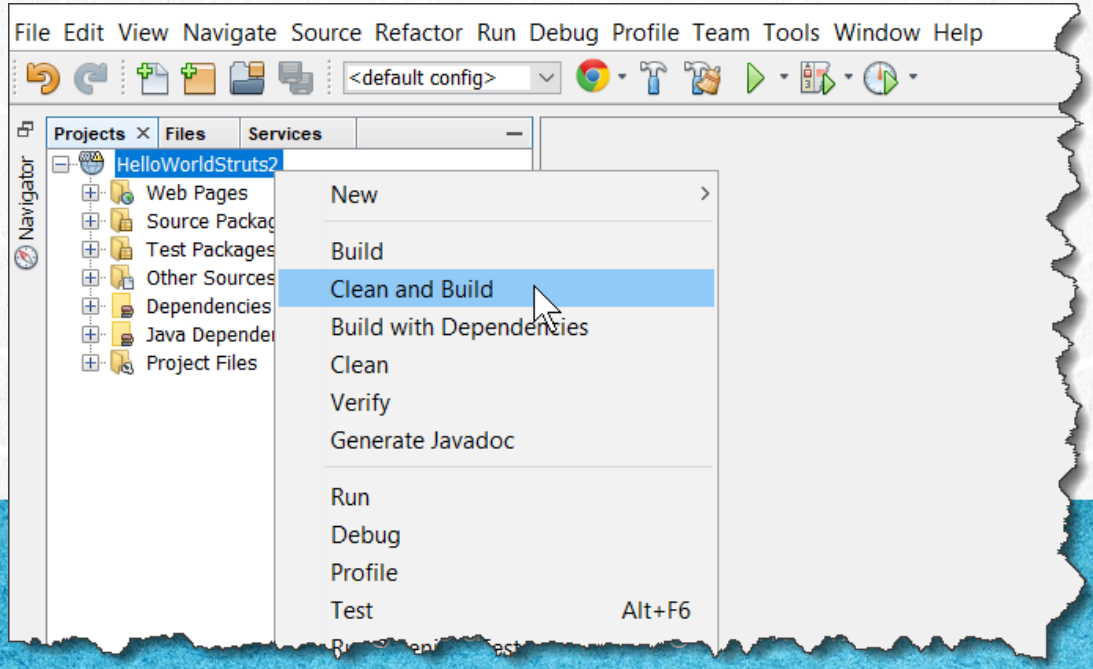
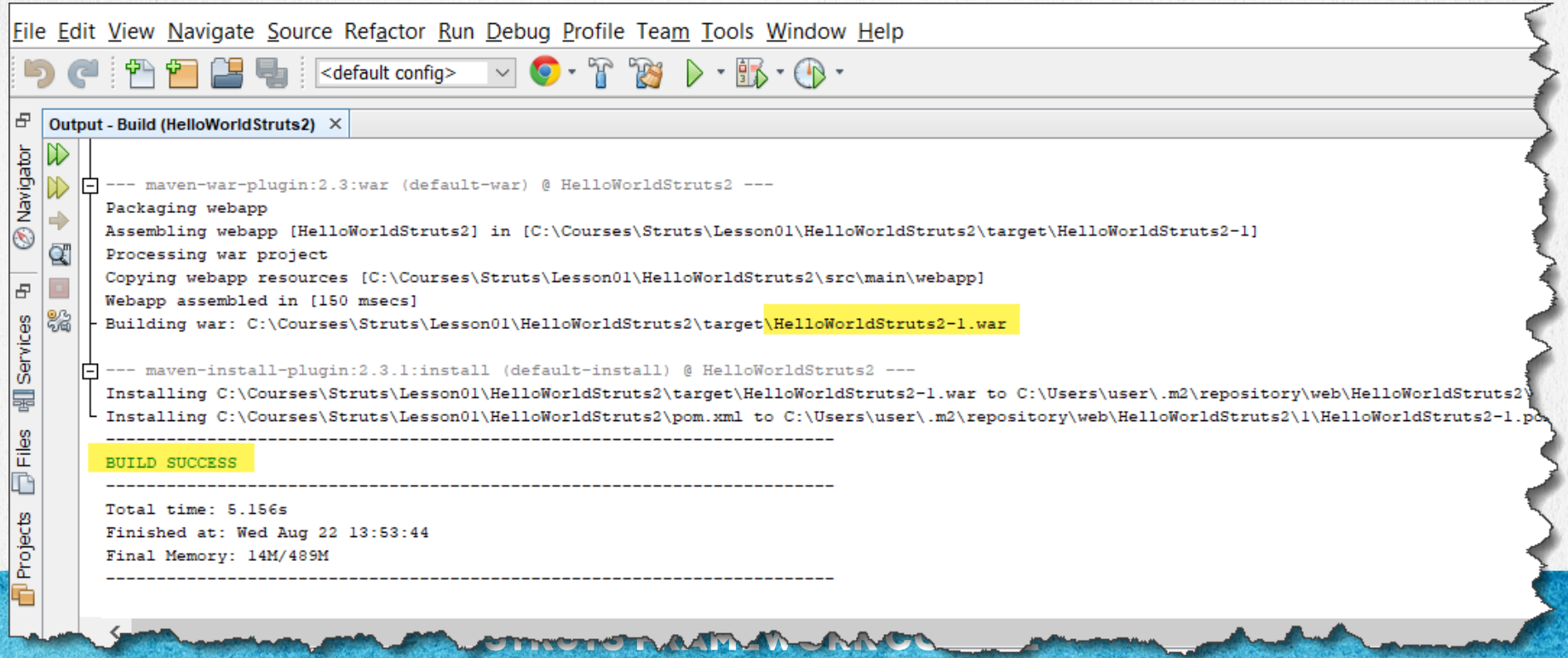
4. EXECUTE CLEAN & BUILD

- To download the 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:



4. EXECUTE CLEAN & BUILD

- Once the process is finished, a result similar to the following should be shown:



5. CREATE A NEW XML FILE

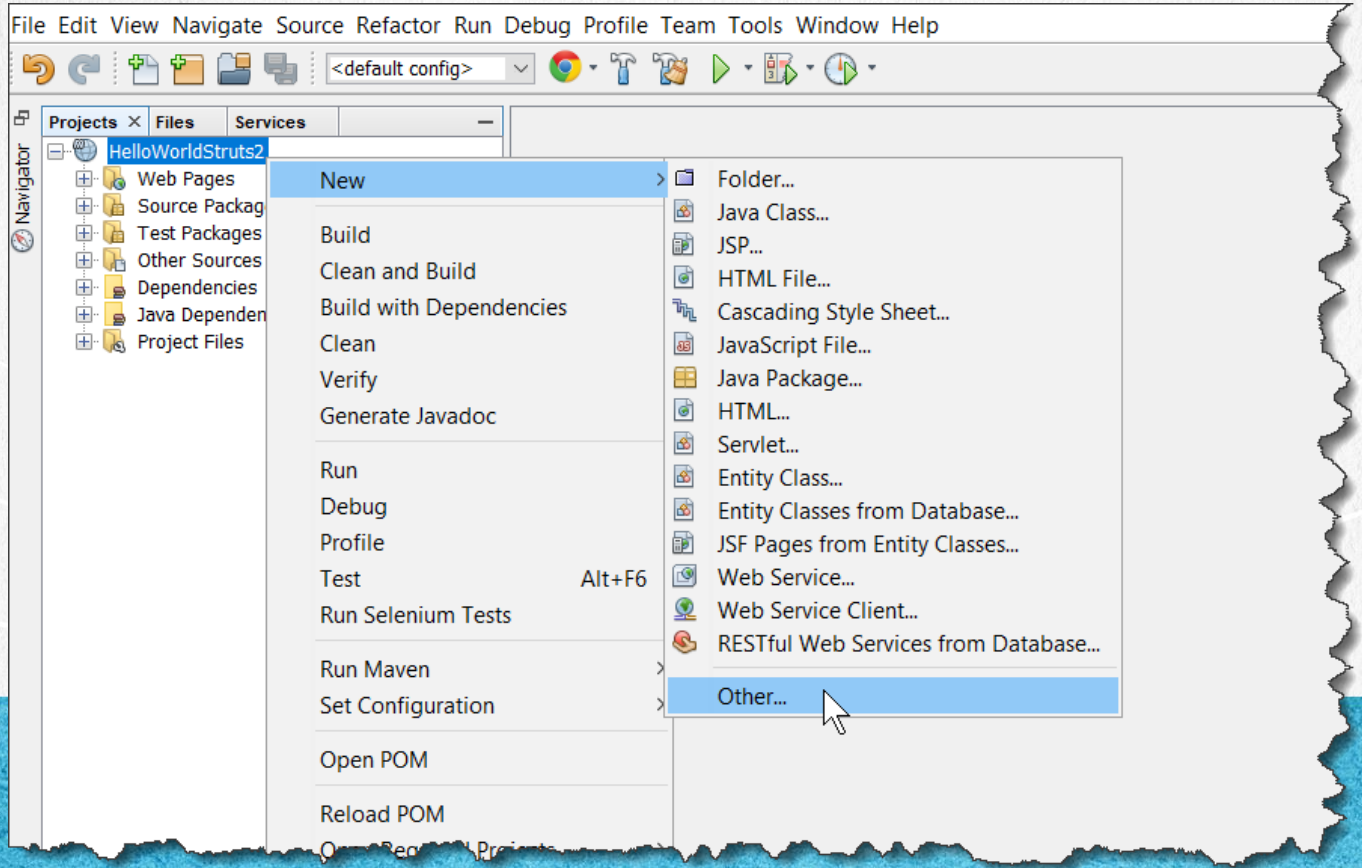
We are going to create the web.xml file below.

This file is what allows us to join a Java Web application with the Struts framework, through the concept of filters (this is a concept of the Servlet API).

In this way we indicate that we are going to work with the Struts framework as we will see below.

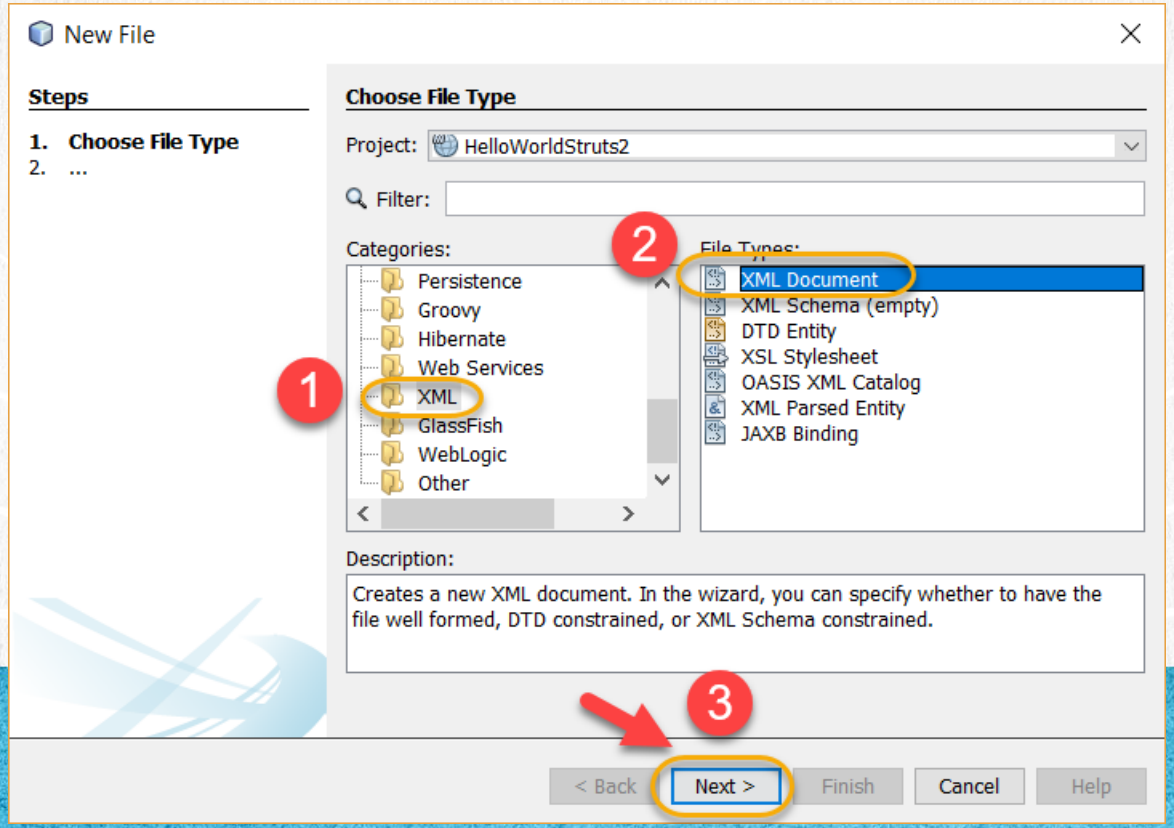
5. CREATE A NEW XML FILE

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



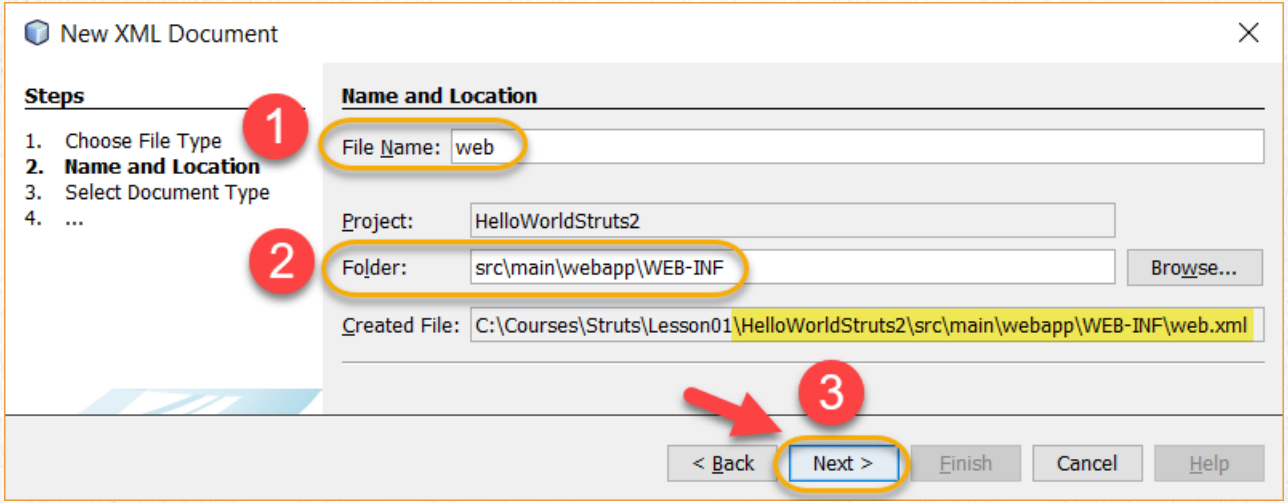
5. CREATE A NEW XML FILE

- Select the XML category and select the XML Document:



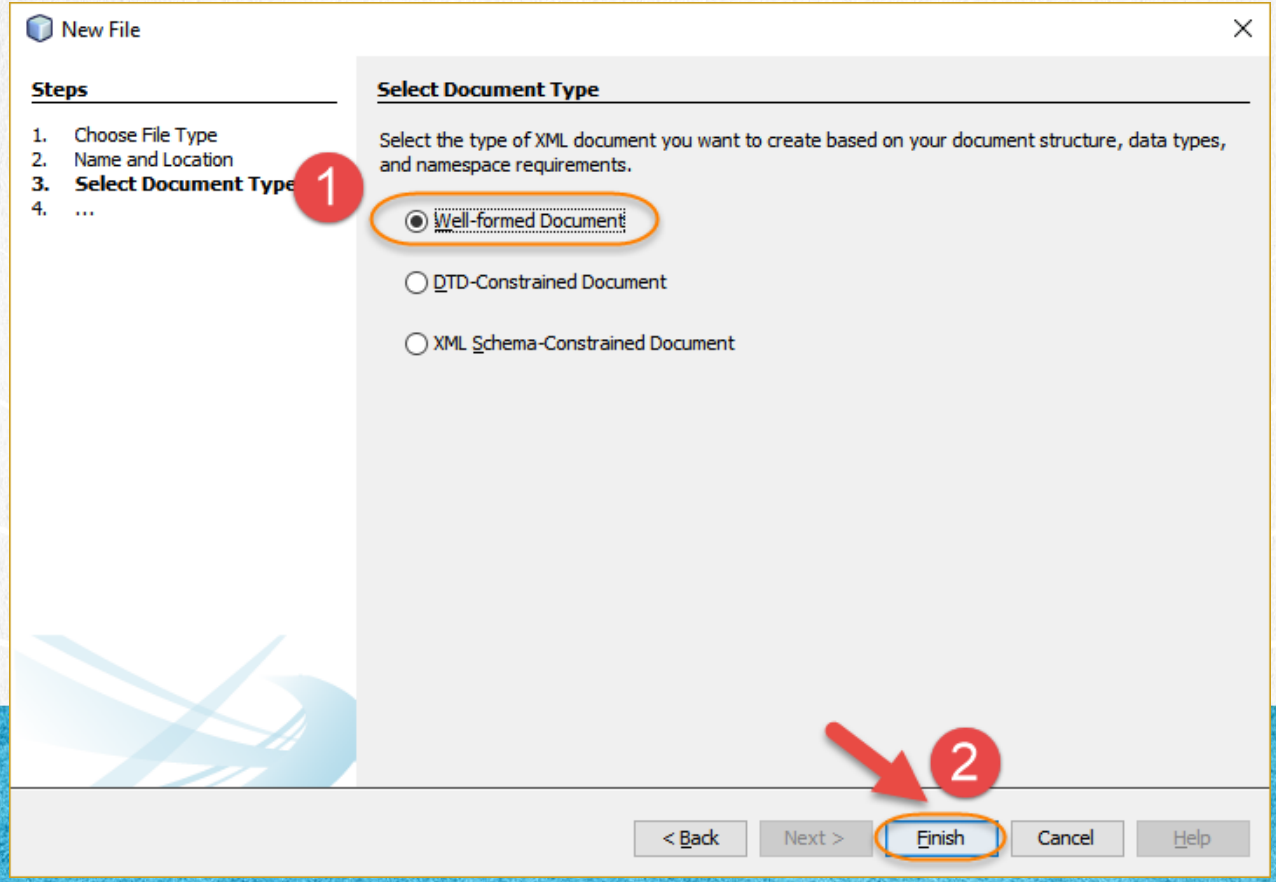
5. CREATE A NEW XML FILE

- The name of the file is web, it is not necessary to add the extension, it added automatically by the IDE since it is an XML type document. Finally we provide the path:



5. CREATE A NEW XML FILE

- We select the indicated type and click on finish.



6. MODIFY THE CODE

web.xml:

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```
<?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>
```

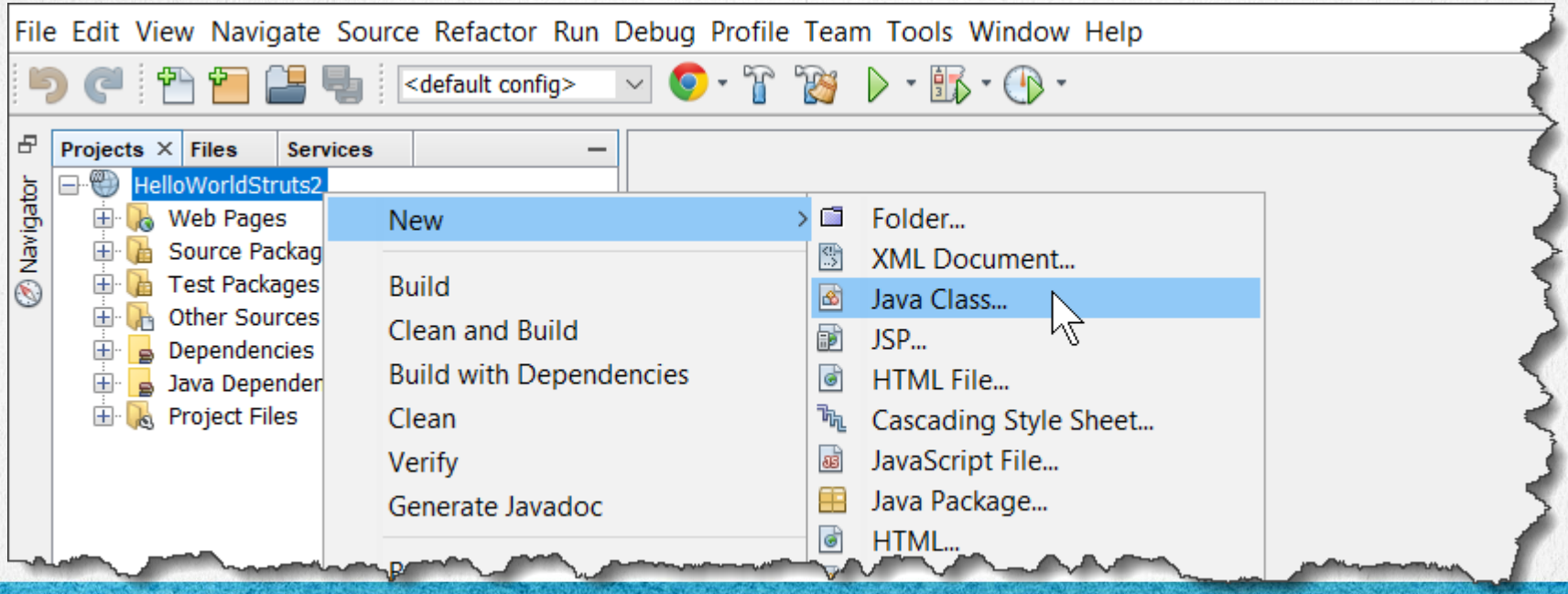
7. CREATE A NEW JAVA CLASS

The class HelloWorldAction.java that we are going to create next will act as Controller (Action) and Model (Bean). For this you must define a method called execute and indicate which is the view that will display the result.

On the other hand, the Model is the information that will be displayed on the result page. In this exercise it will be a simple greeting, however the idea is to start using each of the elements of the MVC design pattern (Model-View-Controller). So this class acts as Controller and Model. Let's see how to perform this task.

7. CREATE A JAVA CLASS

- We create the class HelloWorldAction.java :



7. CREATE A JAVA CLASS

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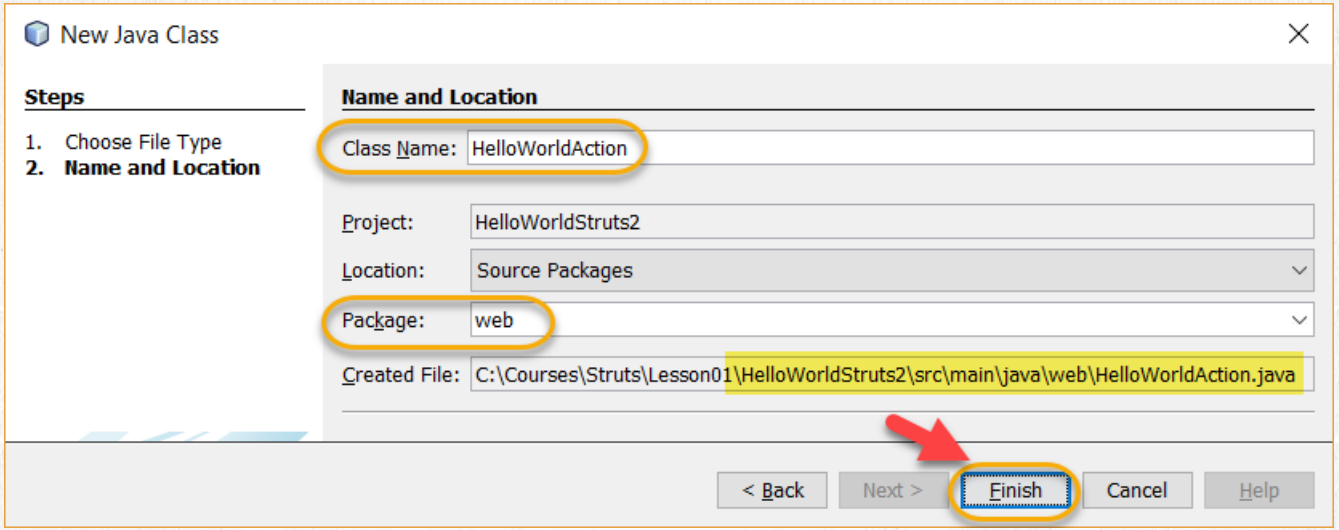

8. MODIFY THE FILE

HelloWorldAction.java:

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```
package web;

import org.apache.logging.log4j.*;

public class HelloWorldAction {

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

    private String greetings;

    public String execute(){
        log.info("Struts 2 execute method");
        setGreetings("Hello from Struts2");
        return "success";
    }

    public String getGreetings() {
        return greetings;
    }

    public void setGreetings(String greetings) {
        this.greetings = greetings;
    }
}
```

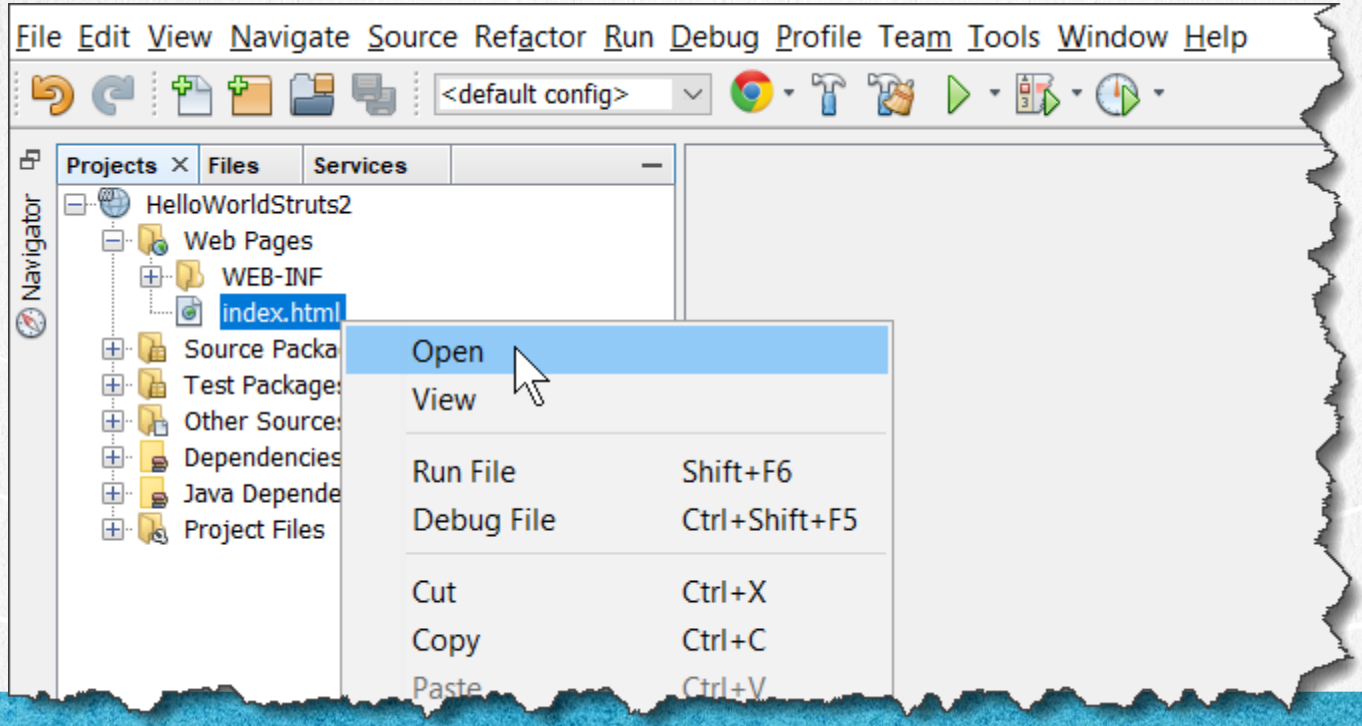
9. MODIFY THE INDEX.HTML

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 is not 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, and later on the struts.xml file is where we will configure each of the elements that will be used for the Struts 2 framework to work correctly.

9. MODIFY THE INDEX.HTML FILE

- Modify the index.html file:



9. MODIFY THE CODE

index.html:

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```
<!DOCTYPE html>
<html>
    <head>
        <title>Home</title>
        <meta charset="UTF-8">
    </head>
    <body>
        <a href="greet">Go to Struts2</a>
    </body>
</html>
```

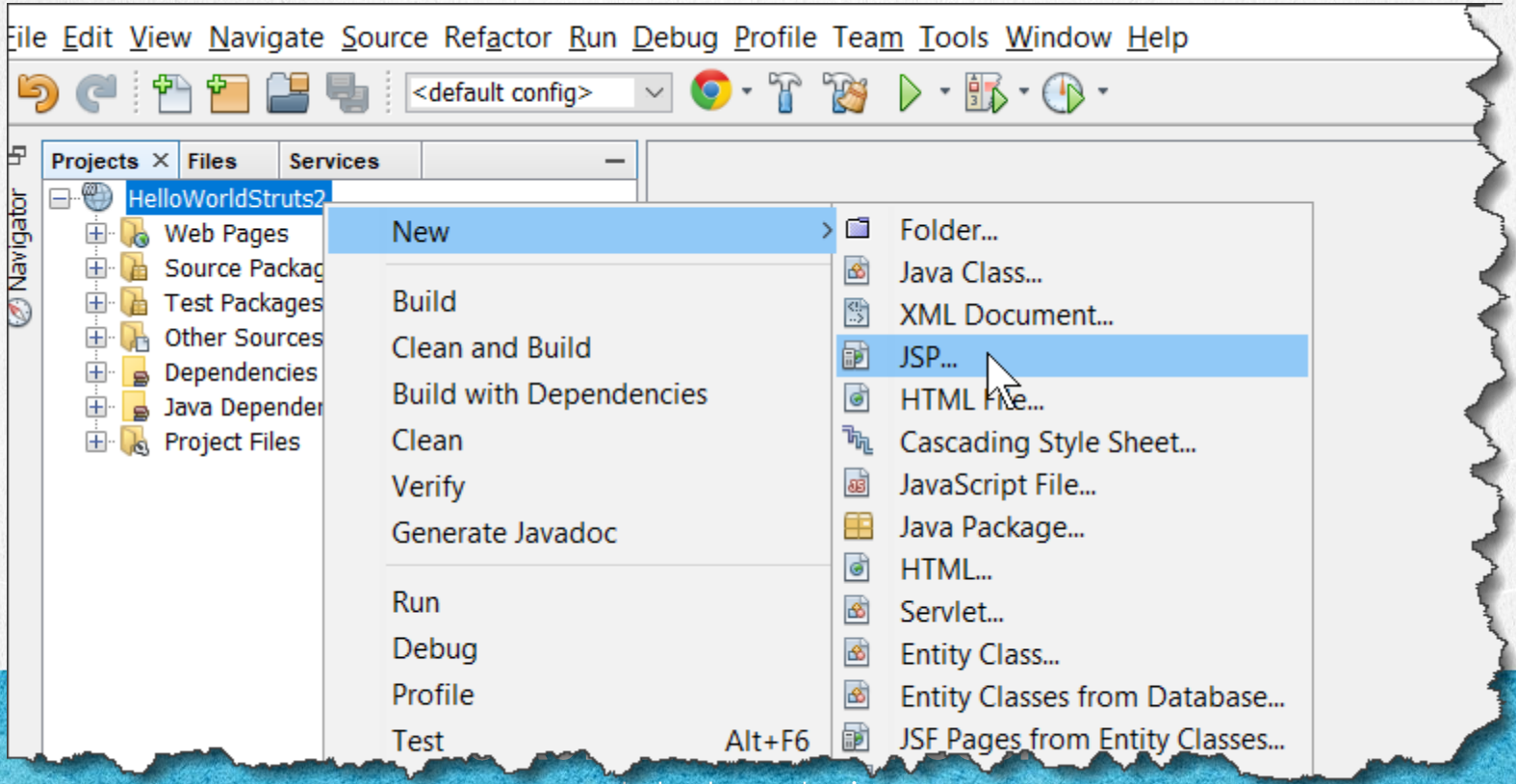
10. CREATE A JSP FILE

Normally JSPs will play the role of the view when we work with Struts. Although it is possible to use other technologies, the most common is that we use JSPs in conjunction with the tags of Struts to create the view.

Next let's see how to perform this task.

10. CREATE A JSP FILE

- We created the greetings.jsp file at the Web Pages level:



10. CREATE A JSP FILE

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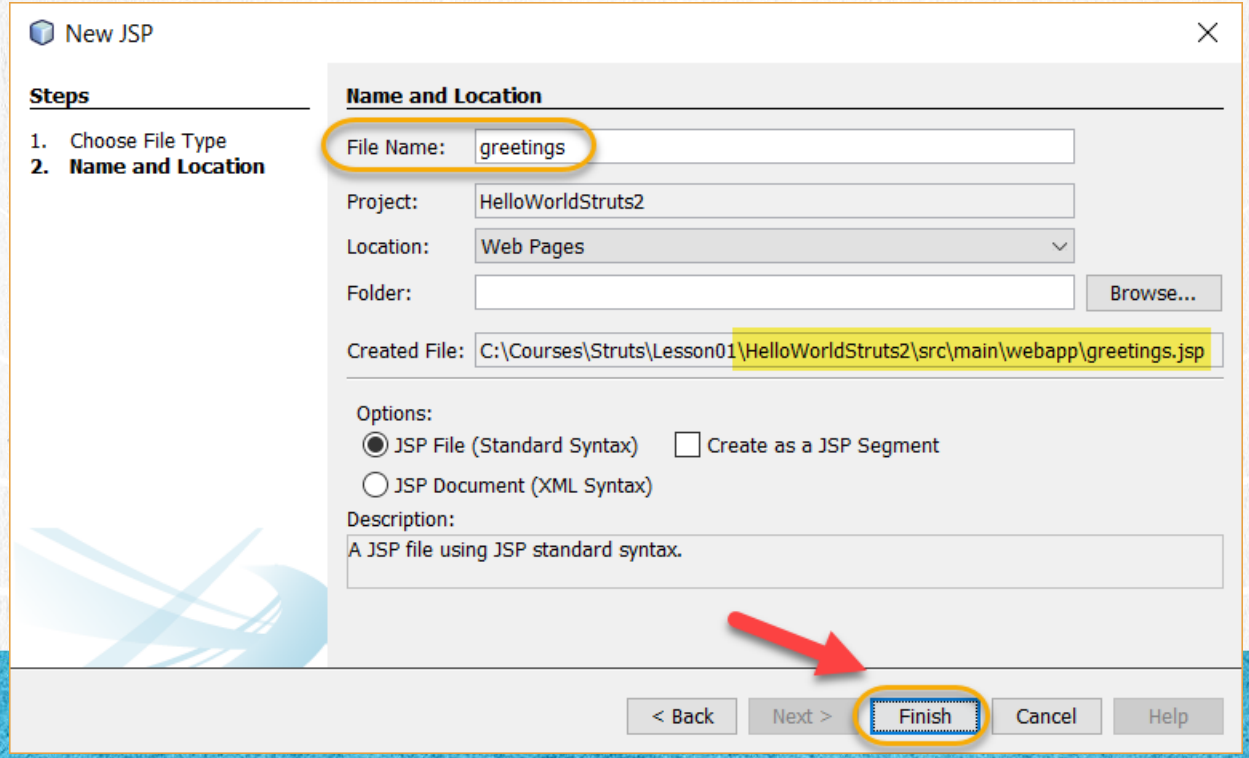

11. MODIFY THE CODE

greetings.jsp:

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```
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<%@taglib  prefix="s" uri="/struts-tags" %>
<!DOCTYPE html>
<html>
    <head>
        <title>Hello World with Struts</title>
    </head>
    <body>
        <h1><s:property value="greetings"></s:property></h1>
    </body>
</html>
```

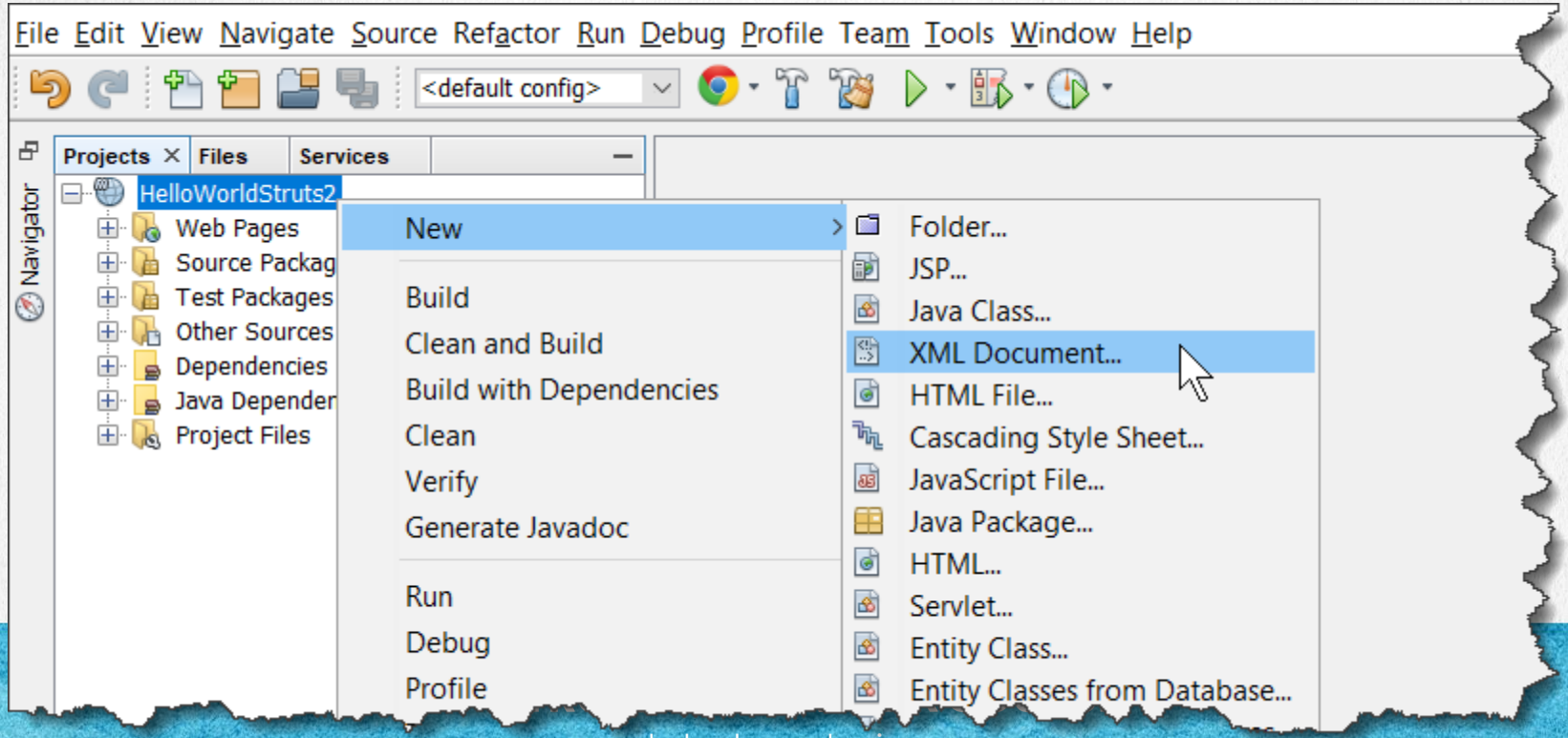
12. CREATE A NEW STRUTS.XML FILE

The struts.xml file is the file that allows us to configure the Struts framework and apply the MVC design pattern, since it is the file that unites all the elements that we will be working on, such as the view (jsp's), the controller (action) and the model (beans).

Let's see how to configure this struts.xml file.

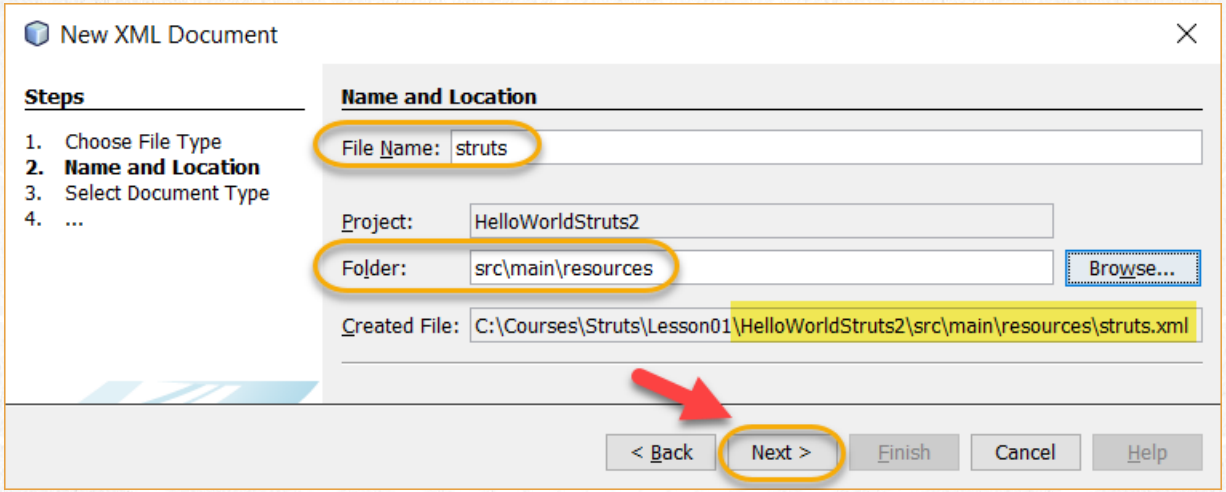
12. CREATE THE STRUTS.XML FILE

- Create the struts.xml file as follows:



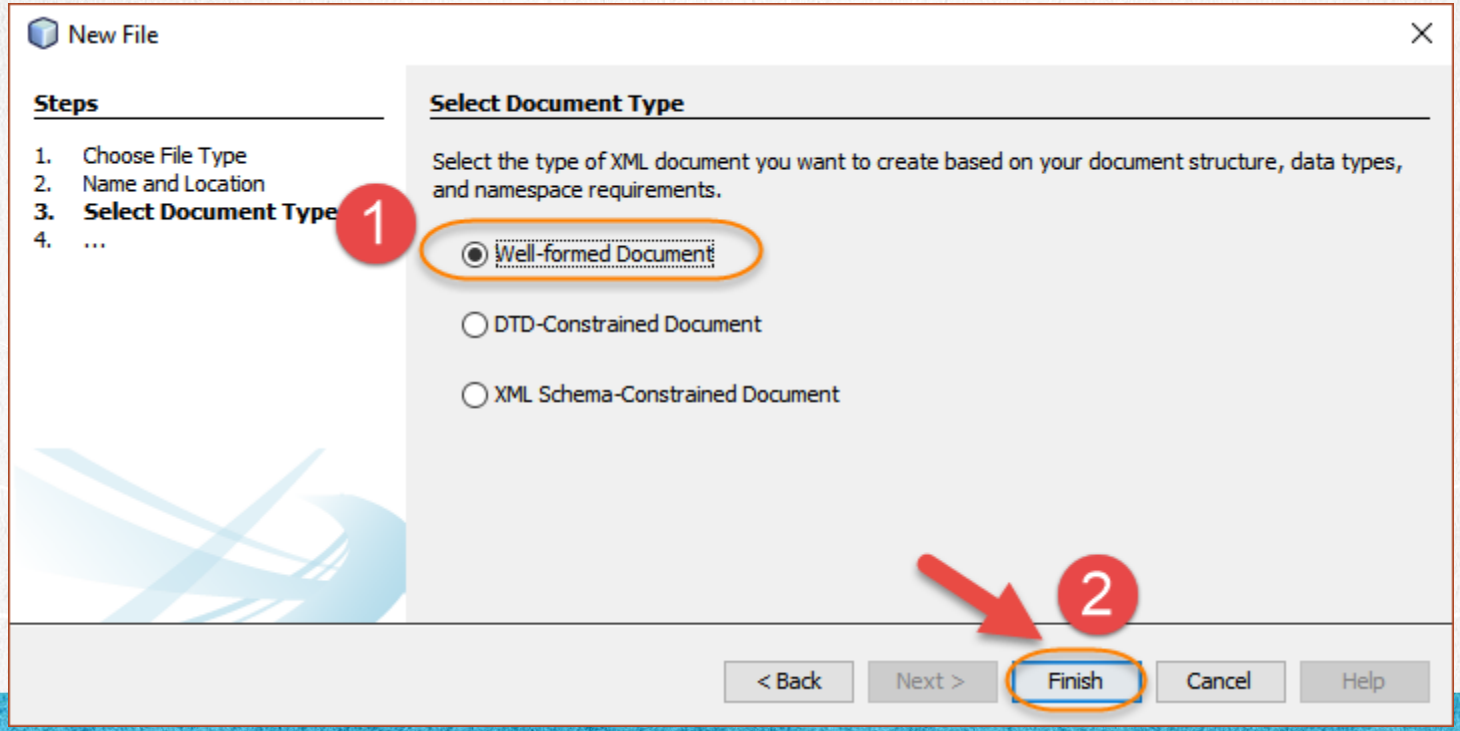
12. CREATE THE STRUTS.XML FILE

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



12. CREATE THE STRUTS.XML FILE

- We select the option shown:



13. MODIFY THE CODE

struts.xml:

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```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE struts PUBLIC
    "-//Apache Software Foundation//DTD Struts Configuration 2.5//EN"
    "http://struts.apache.org/dtds/struts-2.5.dtd">

<struts>

    <constant name="struts.devMode" value="true" />

    <package name="default" extends="struts-default">
        <action name="greet" class="web.HelloWorldAction">
            <result name="success">/greetings.jsp</result>
        </action>
    </package>

</struts>
```

14. CREATE THE LOG4J2.XML FILE

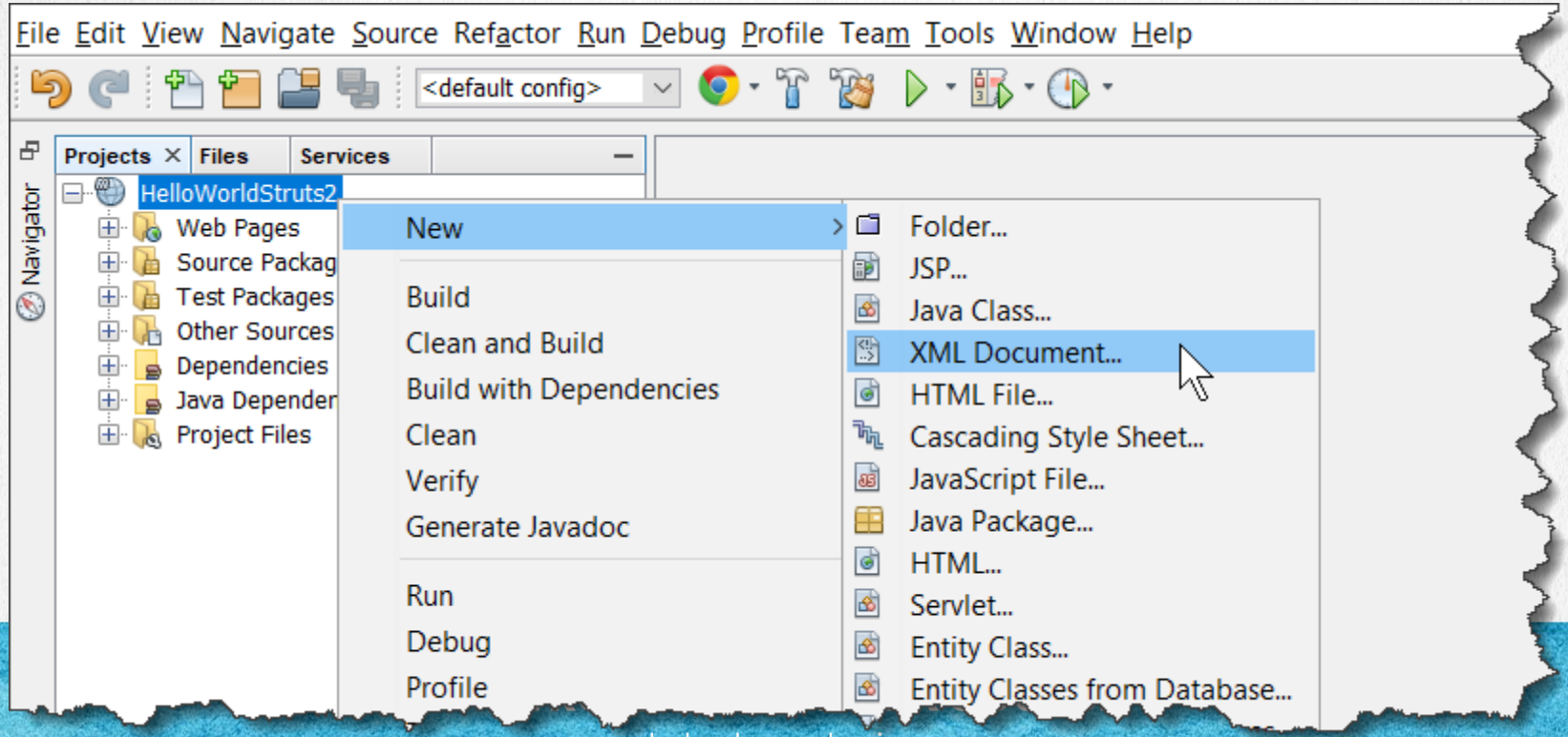
We create a log4j2.xml file. The log4j API allows us to manage the log of a Java application in a simpler way.

To use this API it is only necessary to add the log4j libraries which have already been added via maven, and the log4j2.xml file somewhere that recognizes the classpath, for example in the src folder of the project or in the resources folder if you are using maven.

With this we will be ready to specify what information we want to be sent to the console or other places, such as a file. For more information about this API consult:
https://logging.apache.org/log4j/2.x/

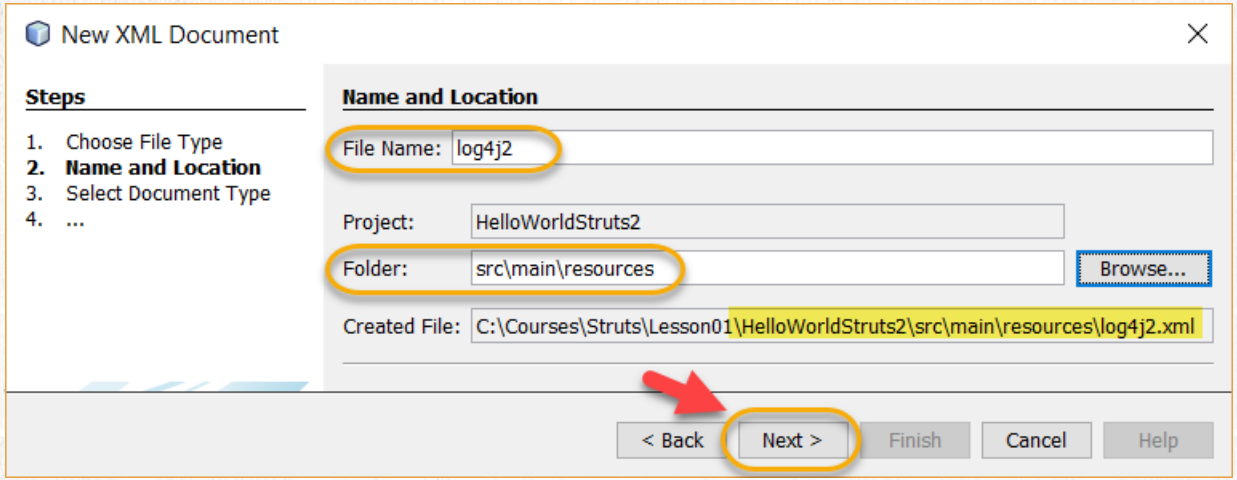
14. CREATE THE LOG4J2.XML FILE

- We create the log4j2.xml file as follows:



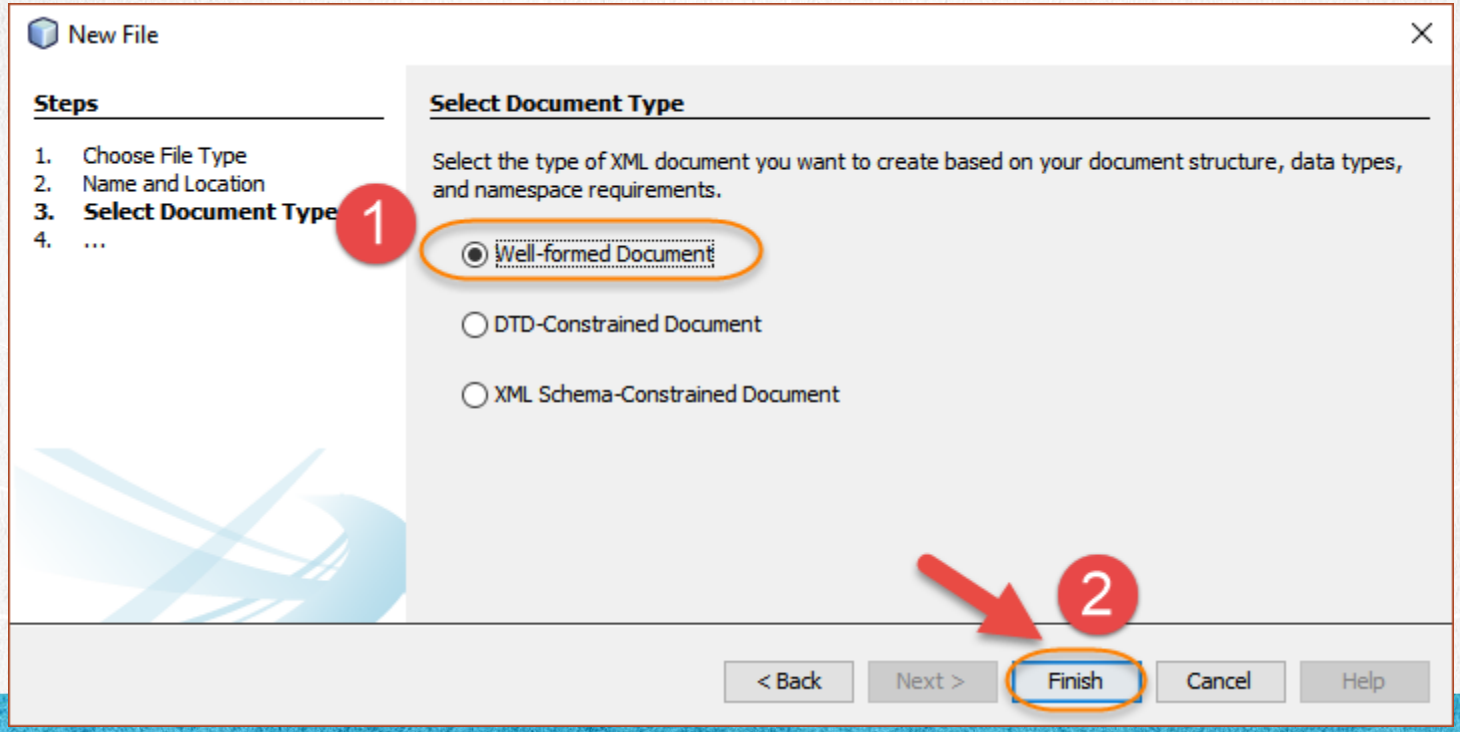
14. CREATE THE LOG4J2.XML FILE

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



14. CREATE THE LOG4J2.XML FILE

- We select the option shown:



15. MODIFY THE FILE

log4j2.xml:

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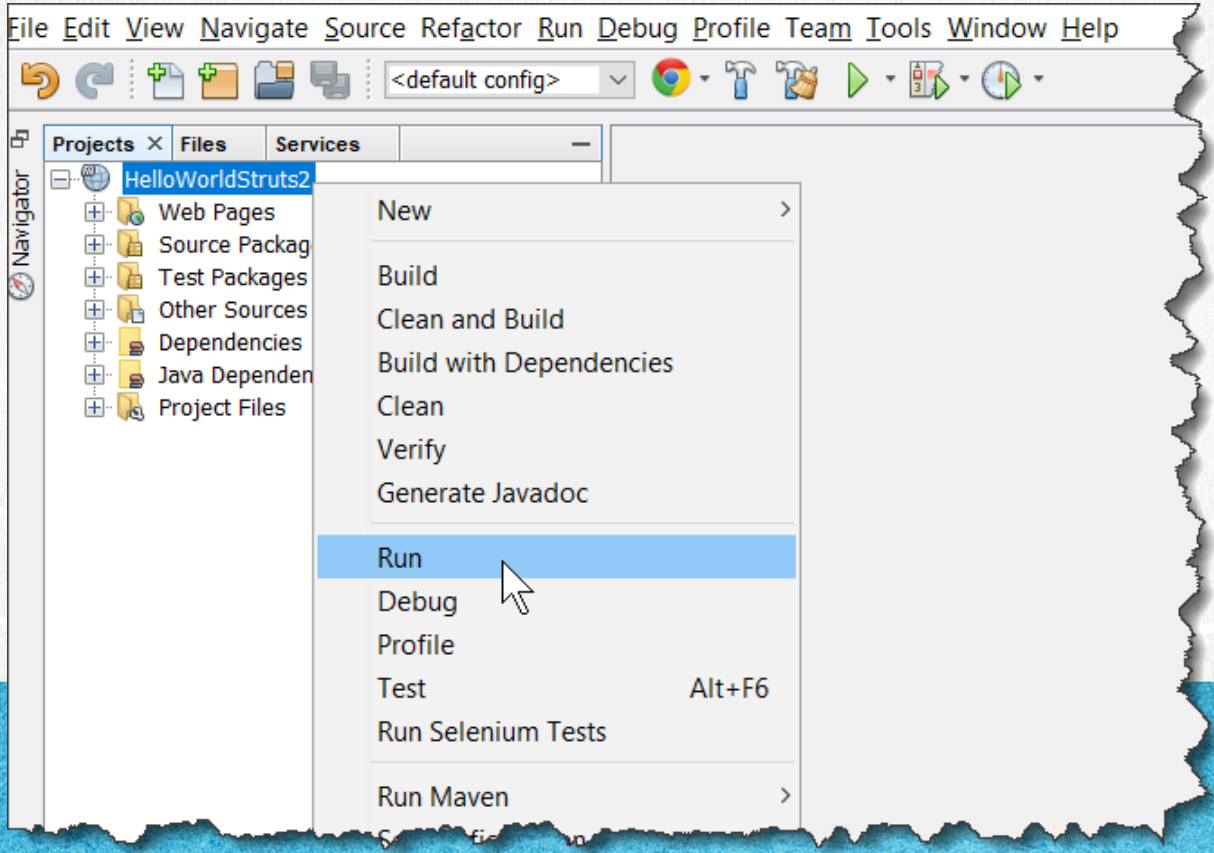
```
<?xml version="1.0" encoding="UTF-8"?>
<Configuration>
    <Appenders>
        <Console name="STDOUT" target="SYSTEM_OUT">
            <PatternLayout pattern="(%F:%L) - %m%n"/>
        </Console>
    </Appenders>
    <Loggers>
        <Logger name="com.opensymphony.xwork2" level="info"/>
       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

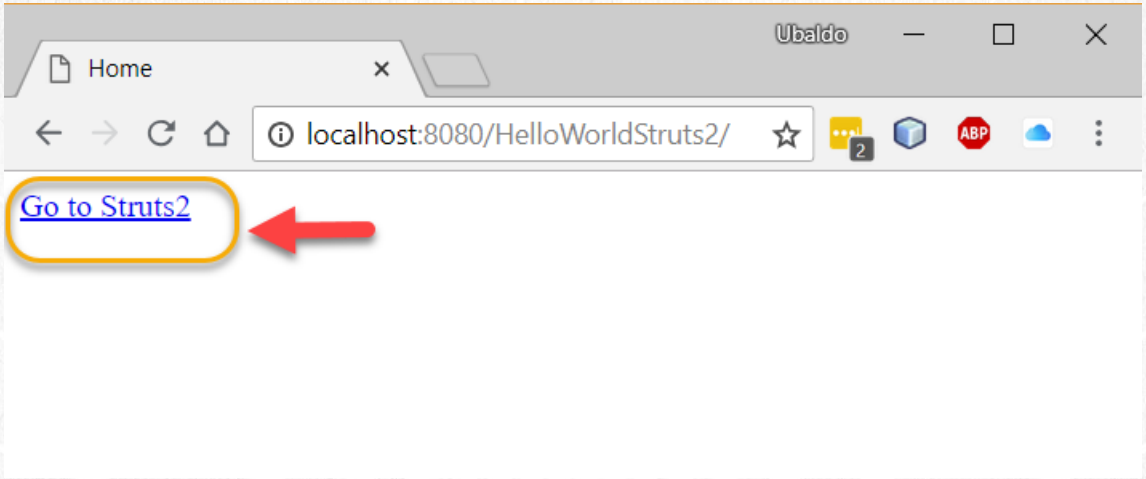
16. EXECUTE THE APPLICATION

- We run the application from the HelloWorldStruts2 class as follows :



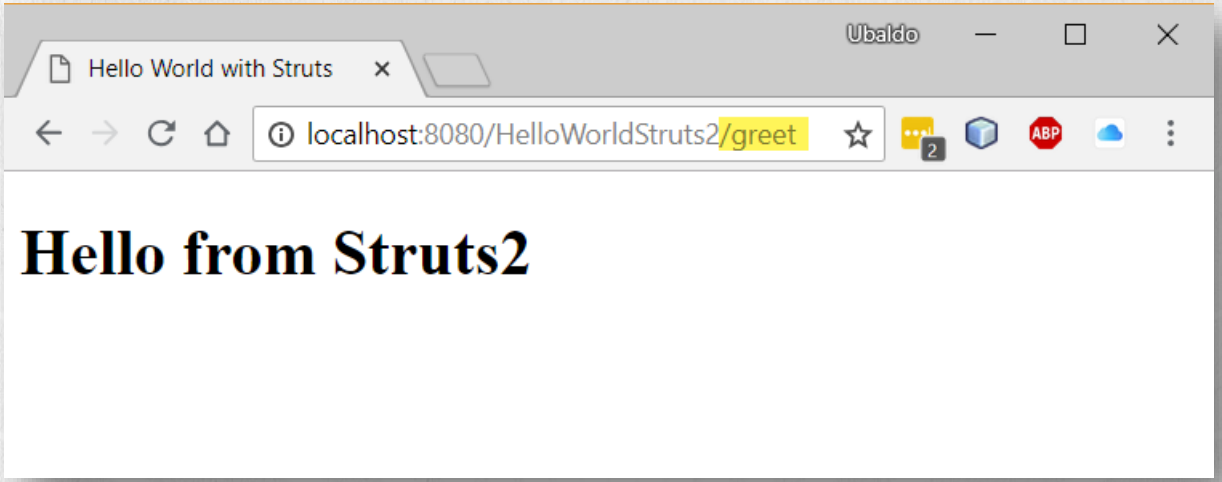
16. EXECUTE THE APPLICATION

- We run the application from the HelloWorldStruts2 class as follows:



16. EXECUTE THE APPLICATION

- We get the result as follows:



IN CASE OF PROBLEMS

- In case of problems you can do the following:

1. Stop Glassfish if it is running
2. Execute the Clean & Build option again to get the latest files of the Project
3. Run the proyect again

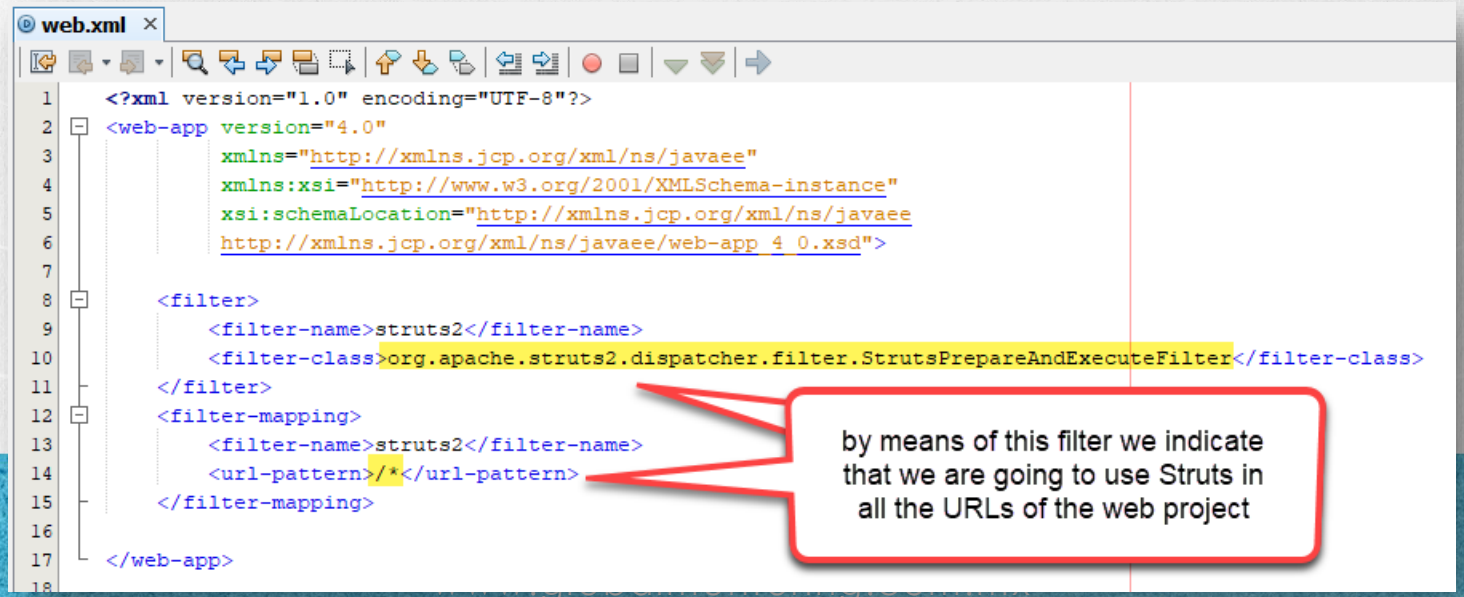
- If the problem is not solved:

1. Import the project solved
2. Execute the Clean and Build option
3. Run the proyect

SUMMARY OF THE EXERCISE

- Below we can see in summary how the Struts 2 framework is linked, as well as each of its elements.

- 1) We indicate through the web.xml file that we are going to use Struts2 through the Struts filter configuration.



SUMMARY OF THE EXERCISE

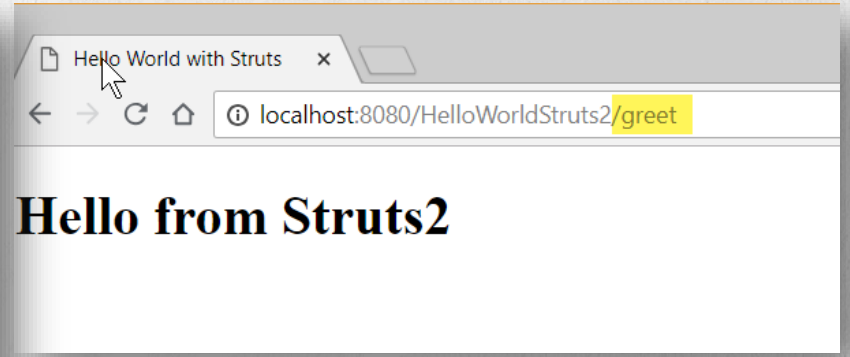
2) Through the struts.xml file we put together all the elements of Struts 2. Some of the most important elements are:

Line 10: a package name is indicated, although it can be any name, it is indicated that it extends the default characteristics of struts.
Line 11: The URL (name) with which the indicated Action class will be executed is indicated. In this case the URL Greet.
Line 12: Once the execute method of the HelloWorldAction class finishes executing, if the result is equal to success, then the JSP called greetings.jsp is displayed. This JSP uses the greetings property to display the greeting that is observed in the Web browser as a result of executing the greet action.

struts.xml

Source | History

```
1  <?xml version="1.0" encoding="UTF-8"?>
2  <!DOCTYPE struts PUBLIC
3      "-//Apache Software Foundation//DTD Struts Configuration 2.5//EN"
4      "http://struts.apache.org/dtds/struts-2.5.dtd">
5
6  <struts>
7
8      <constant name="struts.devMode" value="true" />
9
10     <package name="default" extends="struts-default">
11         <action name="greet" class="web.HelloWorldAction">
12             <result name="success">/greetings.jsp</result>
13         </action>
14     </package>
15
16 </struts>
17
```



EXERCISE CONCLUSION

With this exercise we have created our first exercise using the Struts 2 framework.

Using both Eclipse and Netbeans, or any other IDE is practically the same, since we are not using any IDEs Wizard. In our case we will teach the concepts from scratch, therefore it will not be necessary to use the Wizards, rather than to automate certain tasks the minimum necessary.

Having clear concepts applied and learned in the course, you can quickly apply the Wizards and advantages that your IDE preferably offers, however the idea of the course is not to learn to use an IDE, but to apply these concepts to any IDE, be Netbeans, Eclipse, or any other IDE.

CURSO ONLINE

STRUTS 2 FRAMEWORK

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