JAVA EE COURSE

EXERCISE

HELLO WORLD WITH ENTERPRISE JAVA BEANS (EJB′S)

EXERCISE OBJECTIVE

Create a project to create an EJB. The final result is as follows:

Output | Search Results

Java DB Database Process | GlassFish Server | Run (TestHelloWorldEjb)

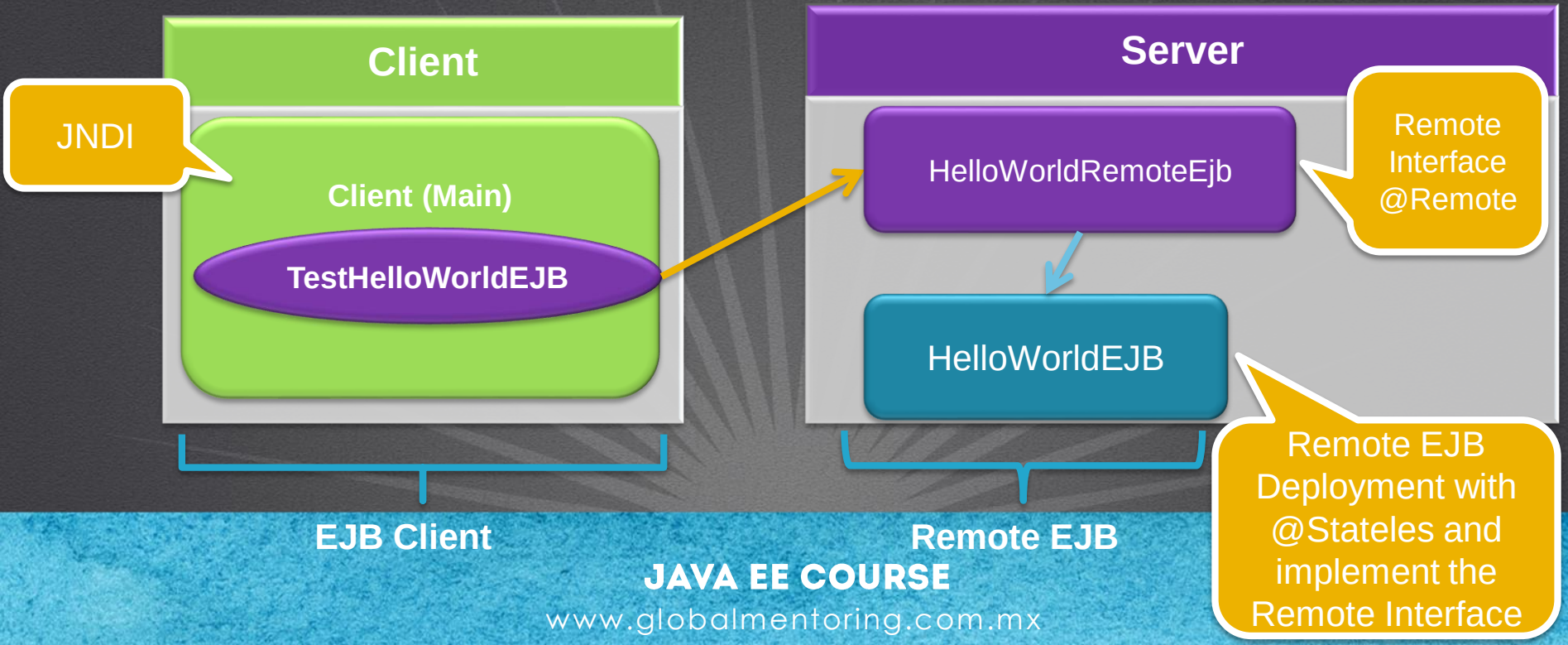
```
--- exec-maven-plugin:1.2.1:exec (default-cli) @ helloworld-ejb ---
Initiating EJB call from the client

EJB Result of adding 5 + 3 = 8
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time: 5.007s
Finished at: Mon Oct 15 20:23:44
Final Memory: 17M/489M
------------------------------------------------------------------------
```

log from the client

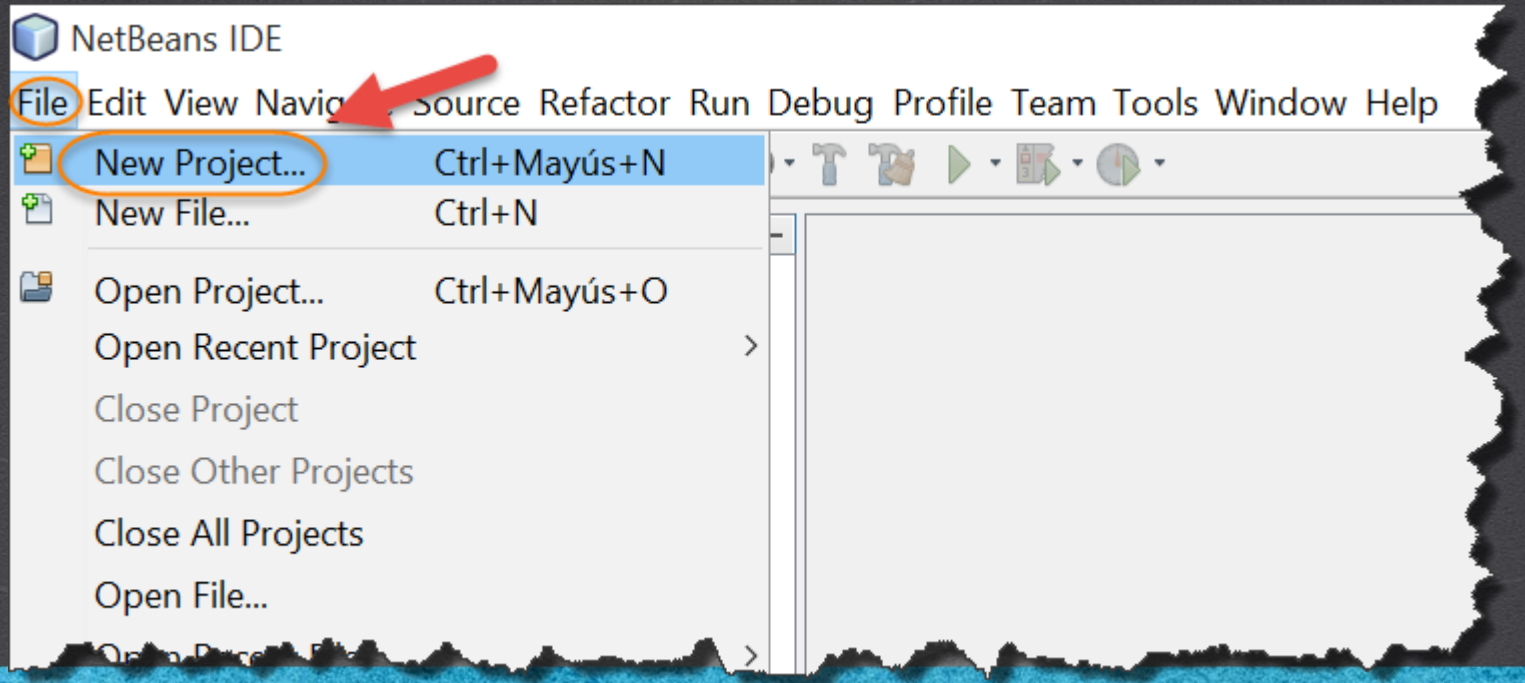
JAVA EE ARCHITECTURE

In this exercise we are going to add a Remote Session EJB. We will use an interface and a Java class. The interface will add the annotation @Remote and the class will implement the interface, we will also add the annotation of @Stateless to convert it into an EJB of Stateless type:



1. CREATE A NEW PROJECT

We create the helloworld-ejb project:



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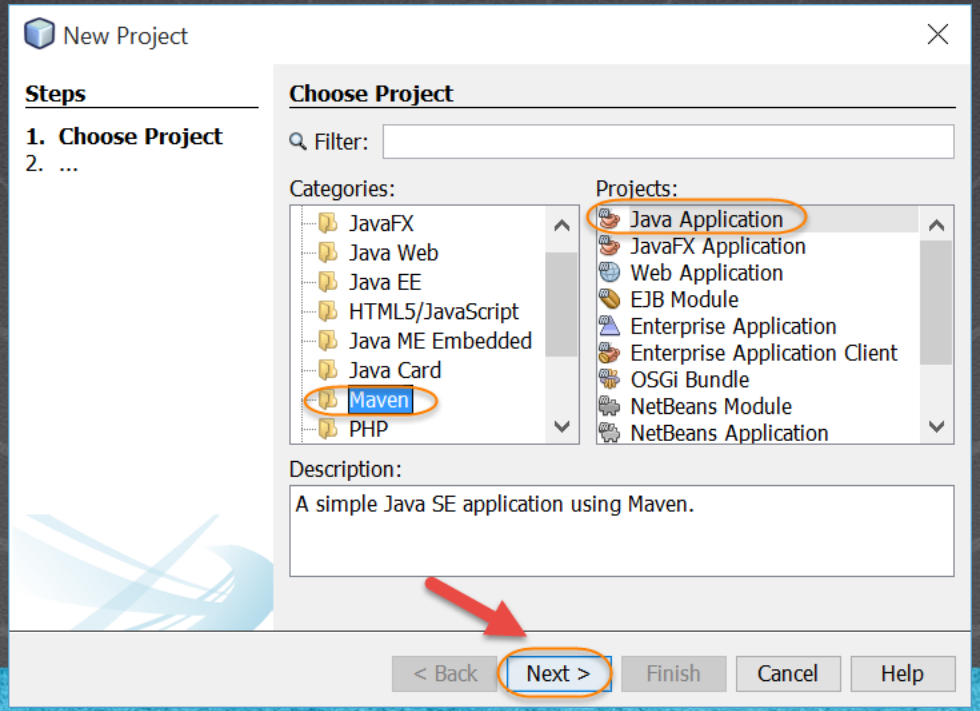
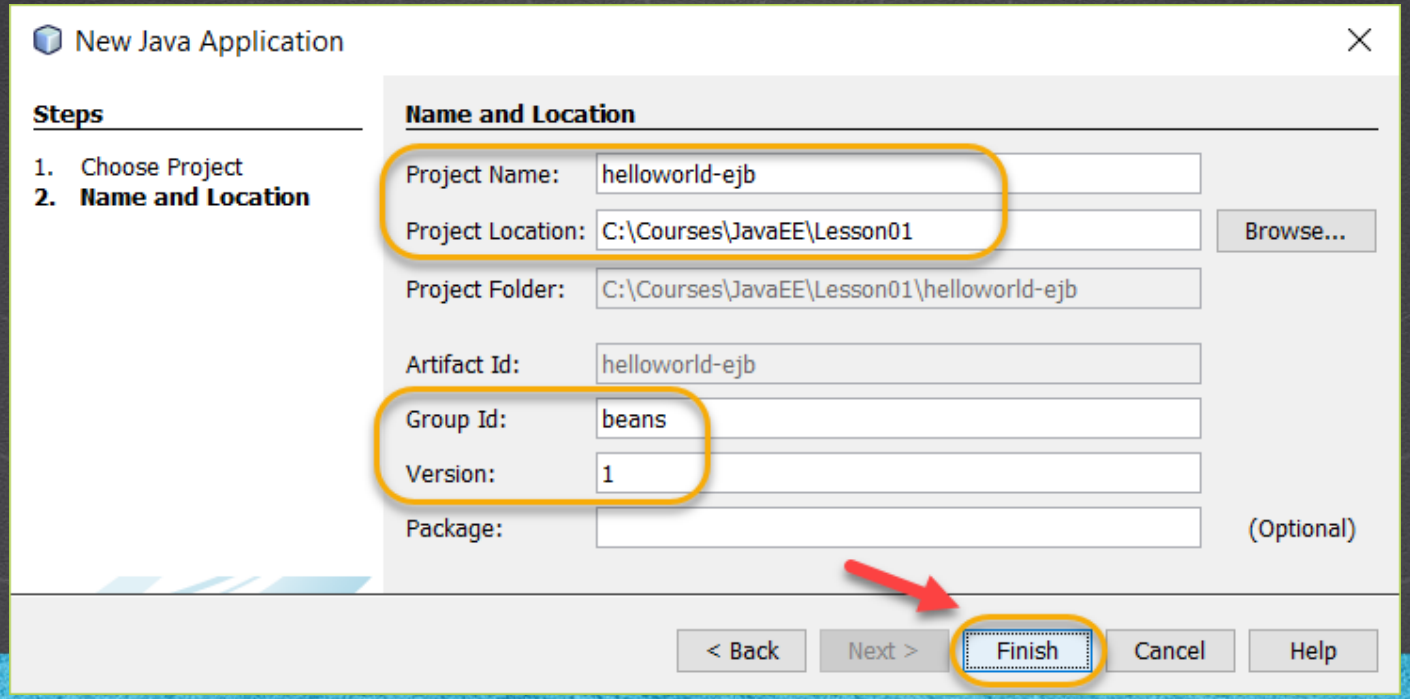


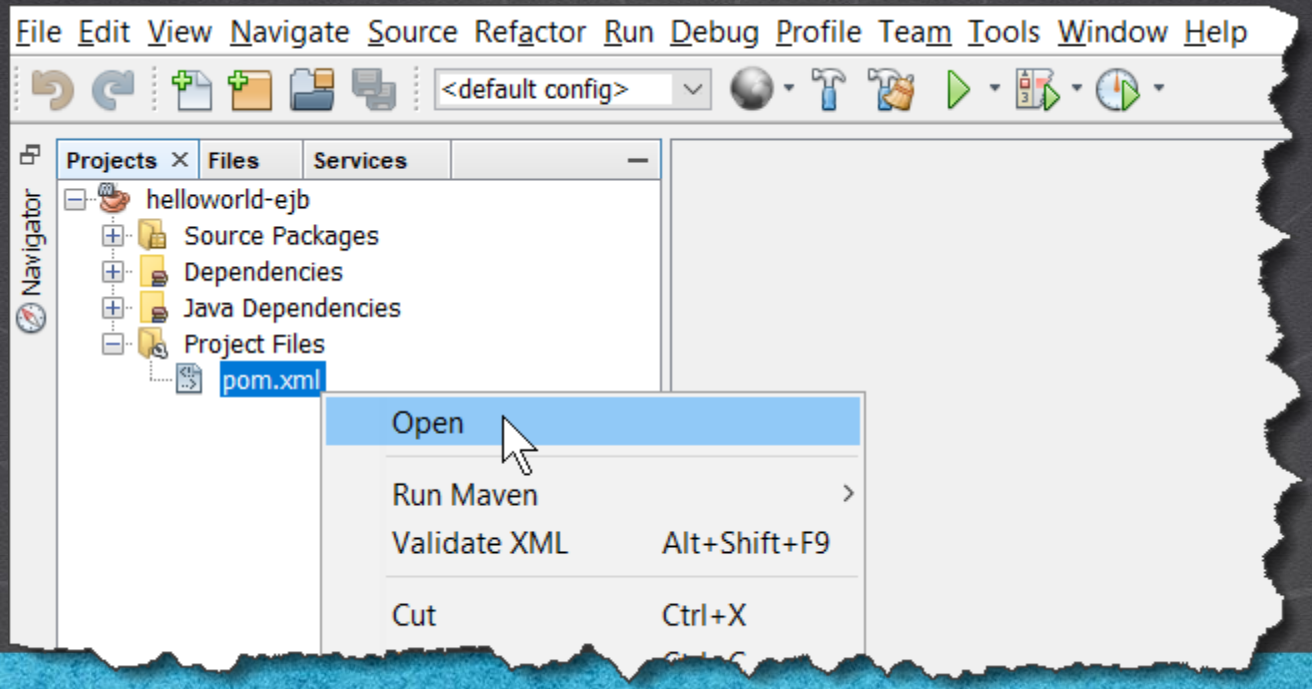
1. CREATE A NEW PROJECT

We create the helloworld-ejb project:



2. MODIFY THE FILE

Modify the pom.xml file:



2. MODIFY THE FILE

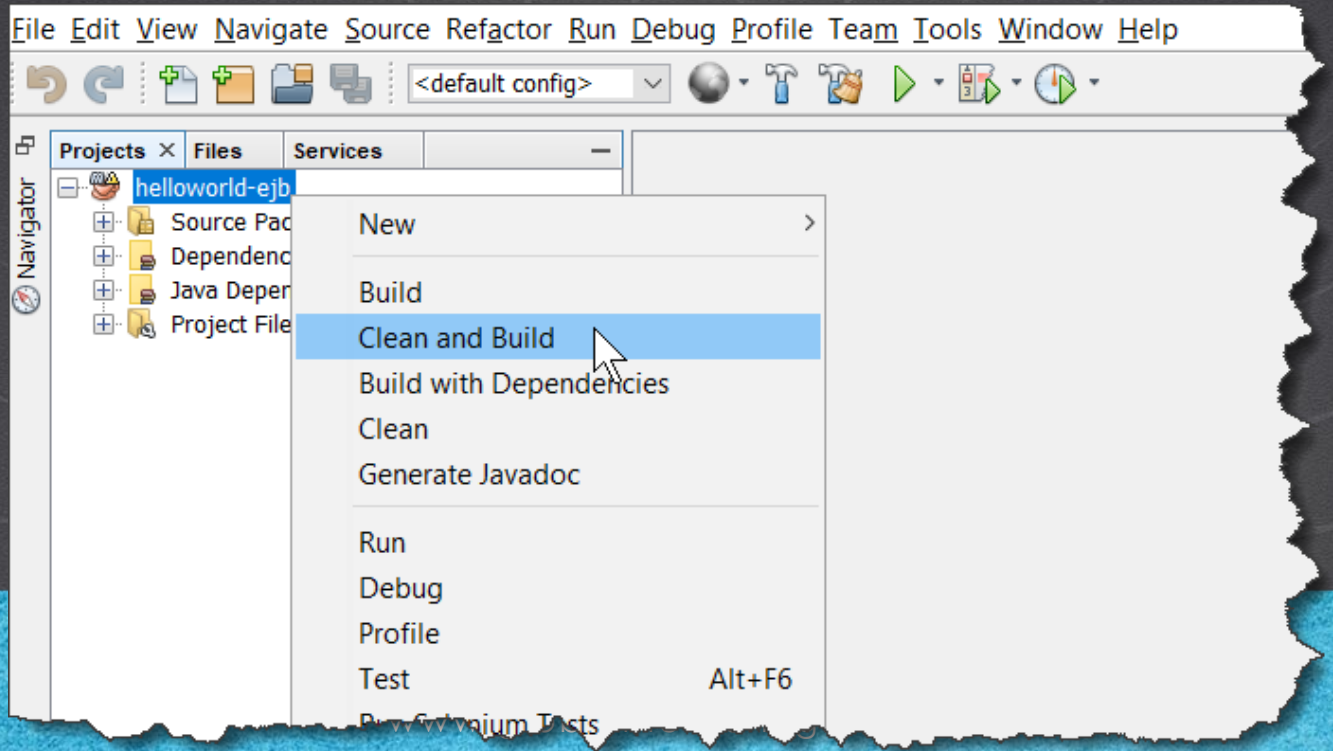
pom.xml:

Click to download

```xml
<?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>beans</groupId>
    <artifactId>helloworld-ejb</artifactId>
    <version>1</version>
    <packaging>jar</packaging>
   <properties>
        <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
        <maven.compiler.source>1.8</maven.compiler.source>
        <maven.compiler.target>1.8</maven.compiler.target>
    </properties>
    <dependencies>
        <dependency>
            <groupId>javax</groupId>
            <artifactId>javaee-api</artifactId>
            <version>8.0</version>
            <scope>provided</scope>
        </dependency>
        <!--Library to run the EJB client-->
        <dependency>
            <groupId>org.glassfish.main.appclient</groupId>
            <artifactId>gf-client</artifactId>
            <version>5.0</version>
        </dependency>
    </dependencies>
</project>
```

3. EXECUTE CLEAN & BUILD

Execute clean & build. Stop any antivirus, firewall, windows defender or any other software that can stop downloading the .jar files:



3. EXECUTE CLEAN & BUILD

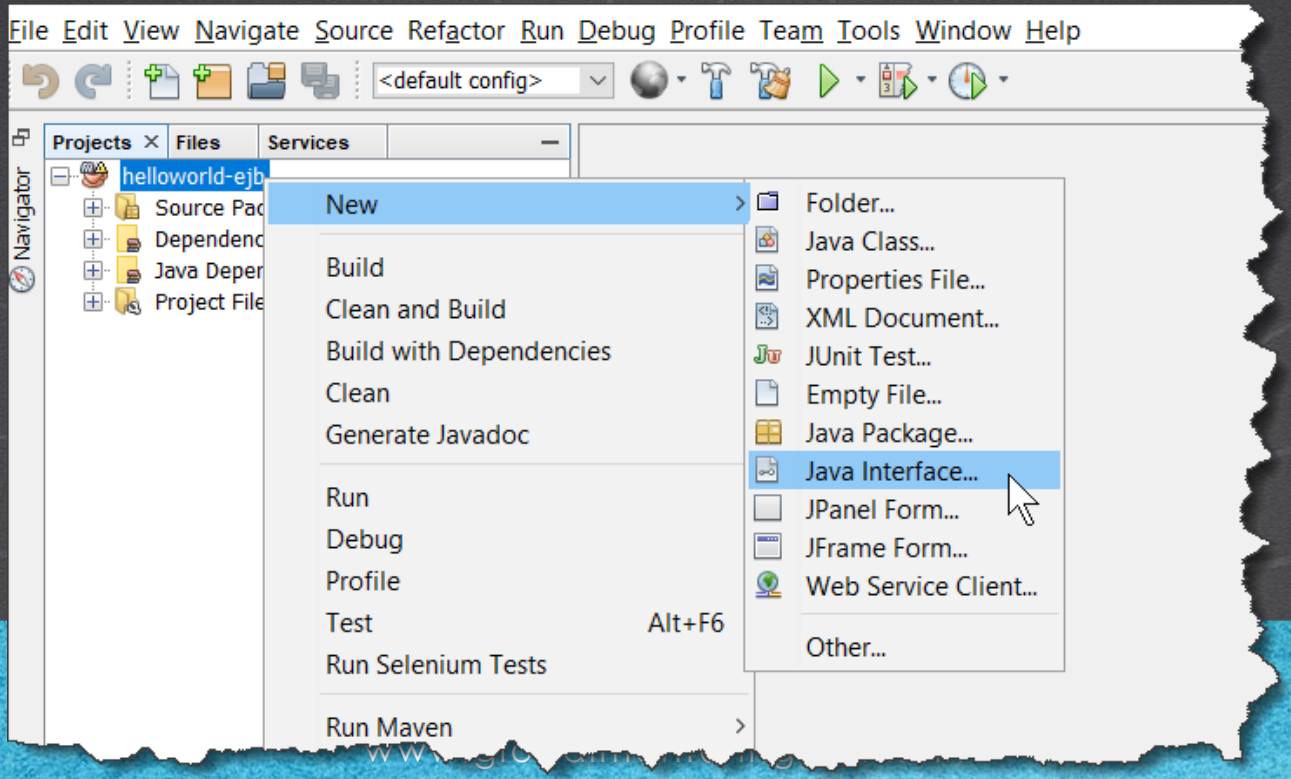
The result is similar as follows:

Output - Build (helloworld-ejb) | Search Results

```
-------------------------------------------------------
 T E S T S
-------------------------------------------------------

Results :

Tests run: 0, Failures: 0, Errors: 0, Skipped: 0


--- maven-jar-plugin:2.3.2:jar (default-jar) @ helloworld-ejb ---
Building jar: C:\Courses\JavaEE\Lesson01\helloworld-ejb\target\helloworld-ejb-1.jar

--- maven-install-plugin:2.3.1:install (default-install) @ helloworld-ejb ---
Installing C:\Courses\JavaEE\Lesson01\helloworld-ejb\target\helloworld-ejb-1.jar to C:\Users\user\.m2\repository\beans\helloworld-ejb\1\hellow
Installing C:\Courses\JavaEE\Lesson01\helloworld-ejb\pom.xml to C:\Users\user\.m2\repository\beans\helloworld-ejb\1\helloworld-ejb-1.pom
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time: 1:15.056s
Finished at: Mon Oct 15 19:07:50
Final Memory: 22M/266M
------------------------------------------------------------------------
```

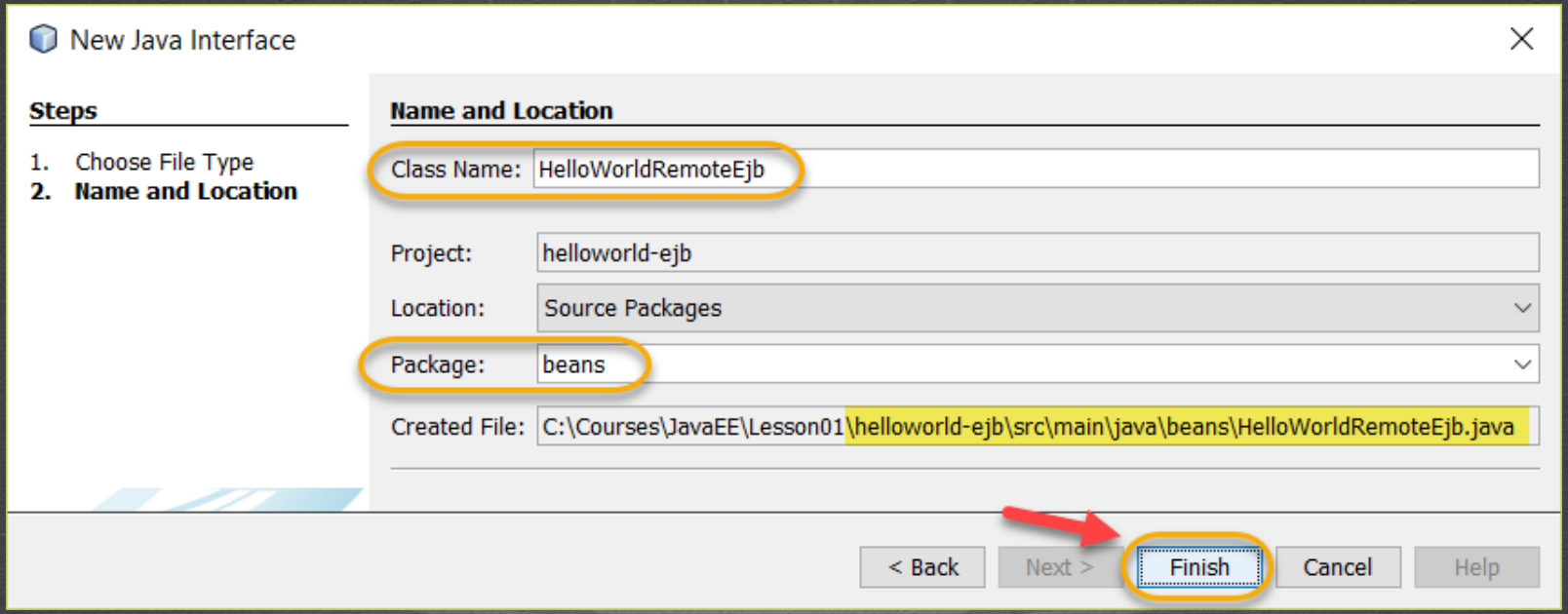
4. CREATE AN INTERFACE

We create the interface HelloWorldRemoteEjb.java:



4. CREATE AN INTERFACE

We create the interface HelloWorldRemoteEjb.java:



5. MODIFY THE FILE

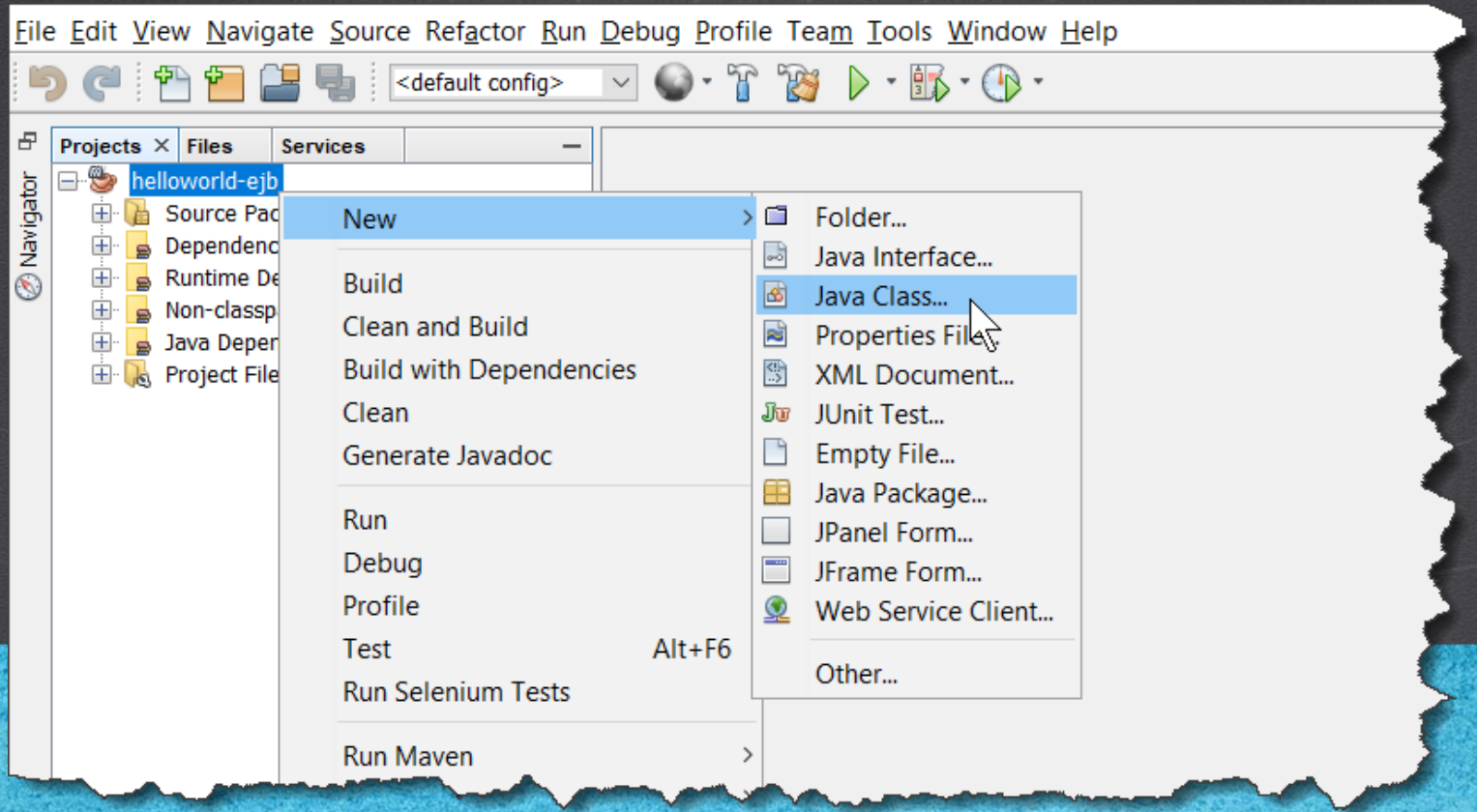
HelloWorldRemoteEjb.java:

Click to download

```
package beans;

import javax.ejb.Remote;

@Remote
public interface HelloWorldRemoteEjb {
     public int add(int a, int b);
}
```

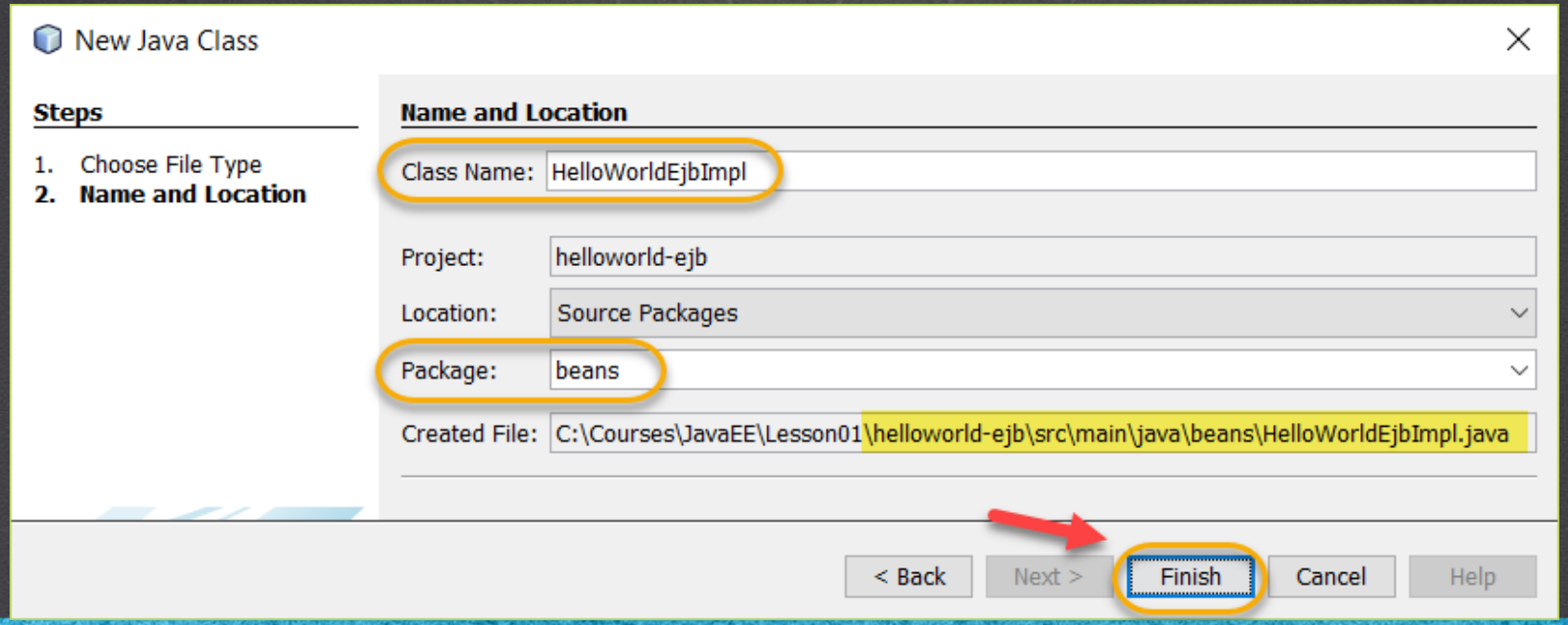
6. CREATE A JAVA CLASS

We create the class HelloWorldEjbImpl.java:



6. CREATE A NEW CLASS

We create the class HelloWorldEjbImpl.java:



7. MODIFY THE CODE

HelloWorldEjbImpl.java:

Click to download

```
package beans;

import javax.ejb.Stateless;

@Stateless
public class HelloWorldEjbImpl implements HelloWorldRemoteEjb{

    @Override
    public int add(int a, int b) {
        System.out.println("Executing add method on the server");
        return a + b;
    }
}
```

8. GENERATE THE .JAR FILE

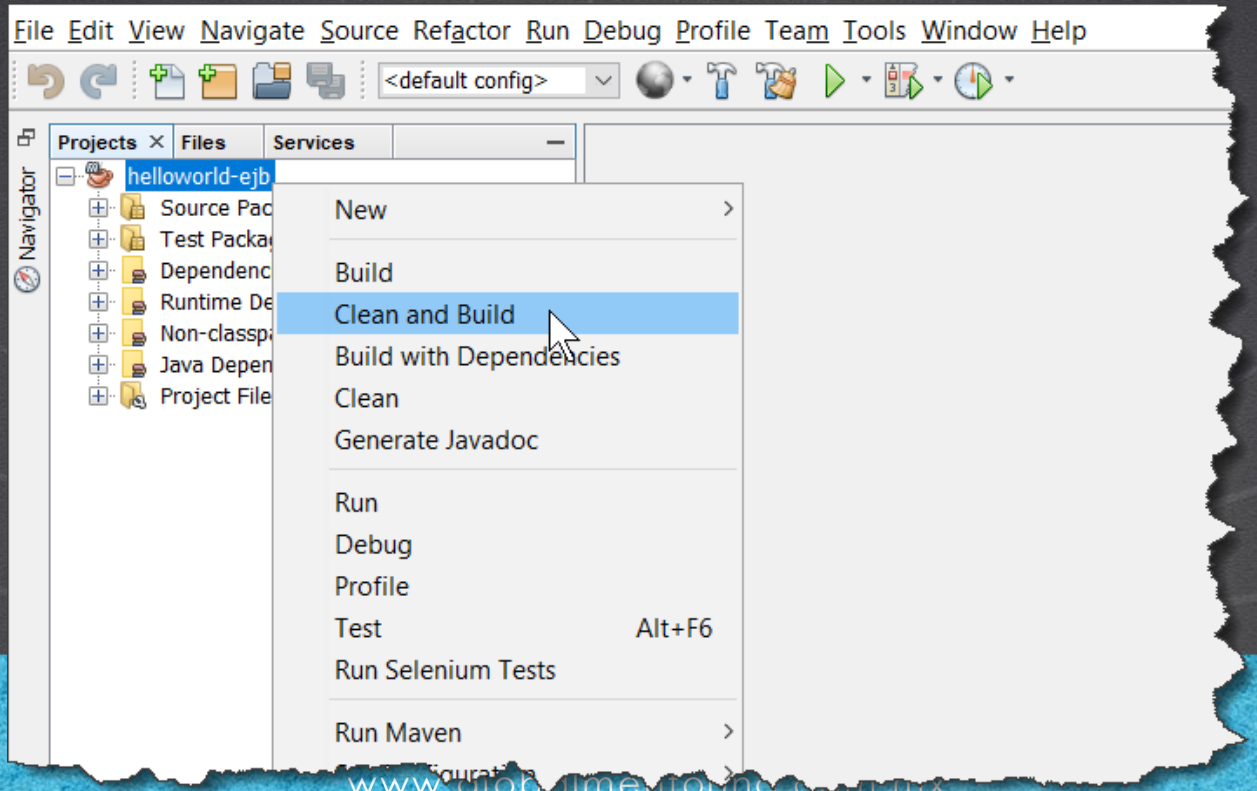
To be able to execute the EJB, it must be deployed in a Java server. In our case we will use Glassfish to deploy the EJB component that we have created.

Later we will create an EJB client to access it. That is, through the application server is that an EJB receives all its power (transaction management, security, connection pool, etc), which is why we can not access it directly, but we will access it through the server of Glassfish in our case.

The Glassfish server must be stopped, and then we will start it.

8. GENERATE THE .JAR FILE

We generate the project .jar, we do clean & build:



8. GENERATE THE .JAR FILE

We see that the helloworld-ejb.jar file was generated.

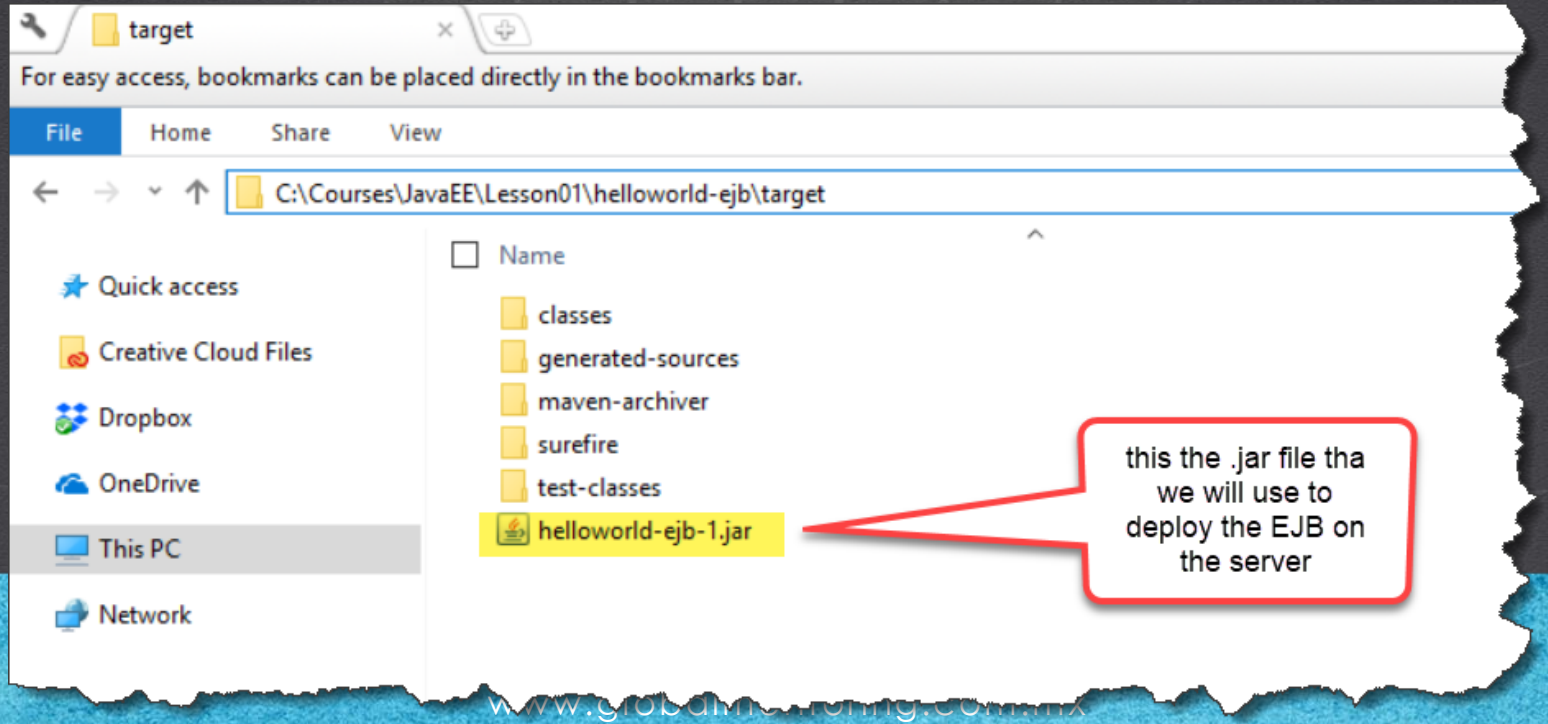
Output - Build (helloworld-ejb) | Search Results

```
-------------------------------------------------------
 T E S T S
-------------------------------------------------------

Results :

Tests run: 0, Failures: 0, Errors: 0, Skipped: 0


--- maven-jar-plugin:2.3.2:jar (default-jar) @ helloworld-ejb ---
Building jar: C:\Courses\JavaEE\Lesson01\helloworld-ejb\target\helloworld-ejb-1.jar

--- maven-install-plugin:2.3.1:install (default-install) @ helloworld-ejb ---
Installing C:\Courses\JavaEE\Lesson01\helloworld-ejb\target\helloworld-ejb-1.jar to C:\Users\user\.m2\repo
Installing C:\Courses\JavaEE\Lesson01\helloworld-ejb\pom.xml to C:\Users\user\.m2\repository\beans\hellowo
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time: 4.974s
Finished at: Mon Oct 15 19:21:53 CDT
Final Memory: 37M/609M
------------------------------------------------------------------------
```

this is the path we will use to deploy this .jar on the server

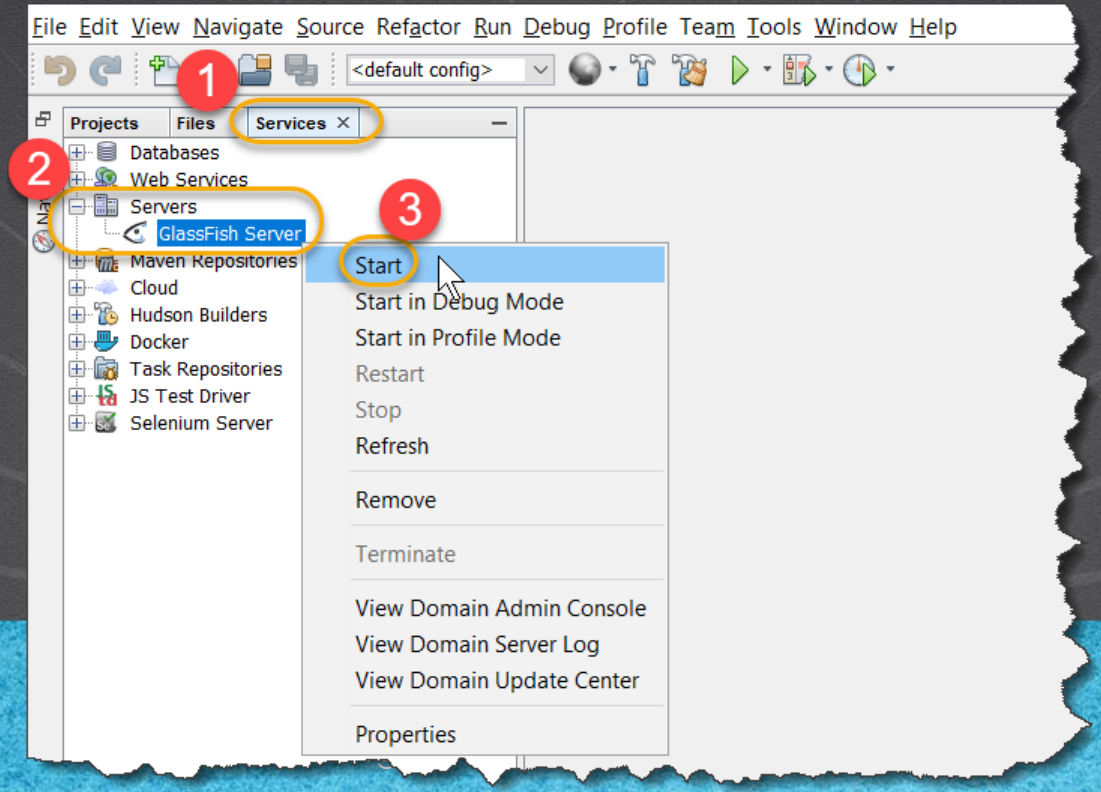
8. GENERATE THE .JAR FILE

We see that the .jar was generated, we take the route and use it later: C:\Courses\JavaEE\Lesson01\helloworld-ejb\target



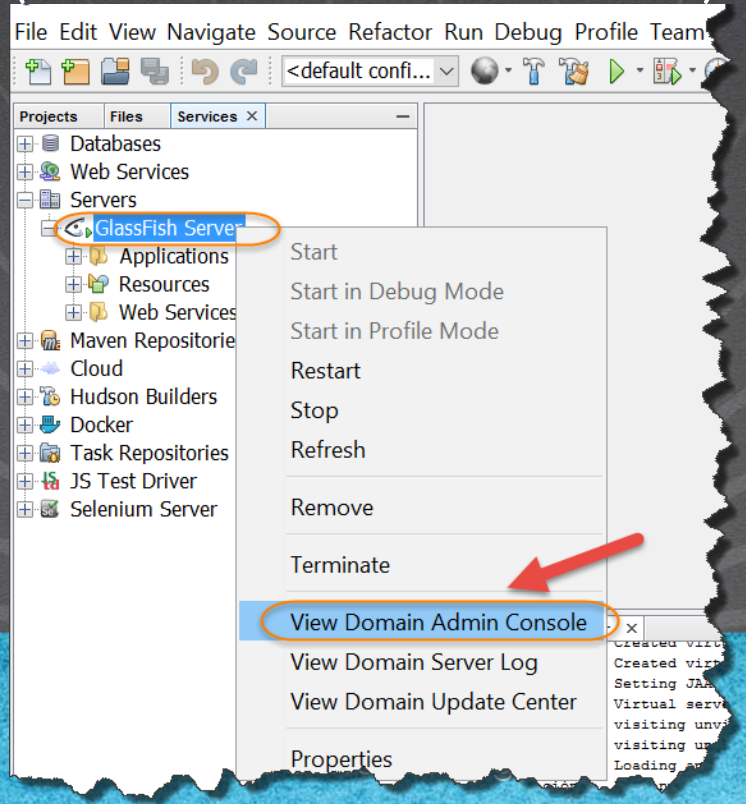
9. START UP GLASSFISH

We raise Glassfish to deploy the EJB. We are going to:
Services -> Servers- Glassfish Server- Start



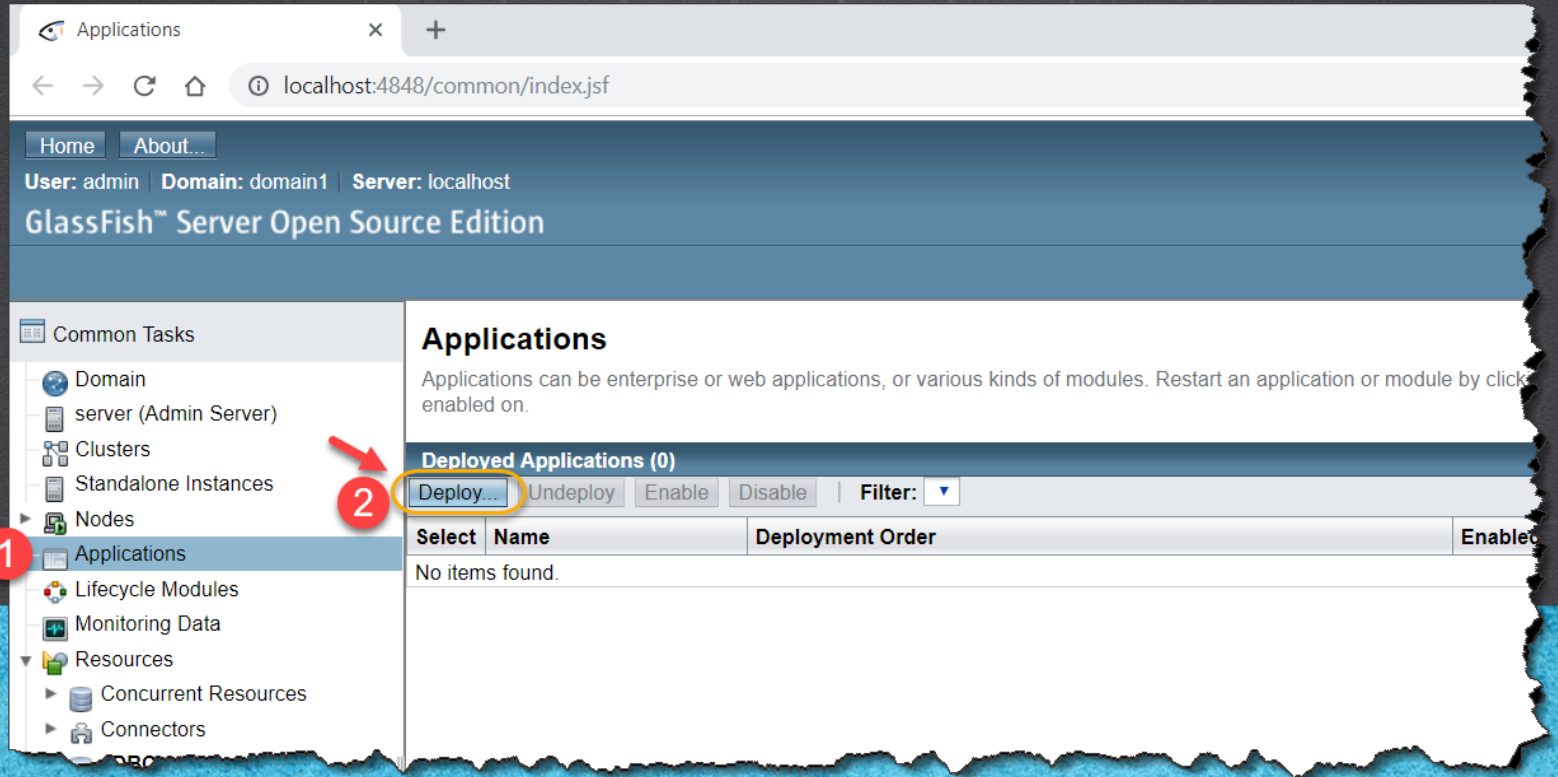
9. START UP GLASSFISH

Once started (it takes about a minute to boot), we enter the Glassfish management console (View Domain Admin Console):



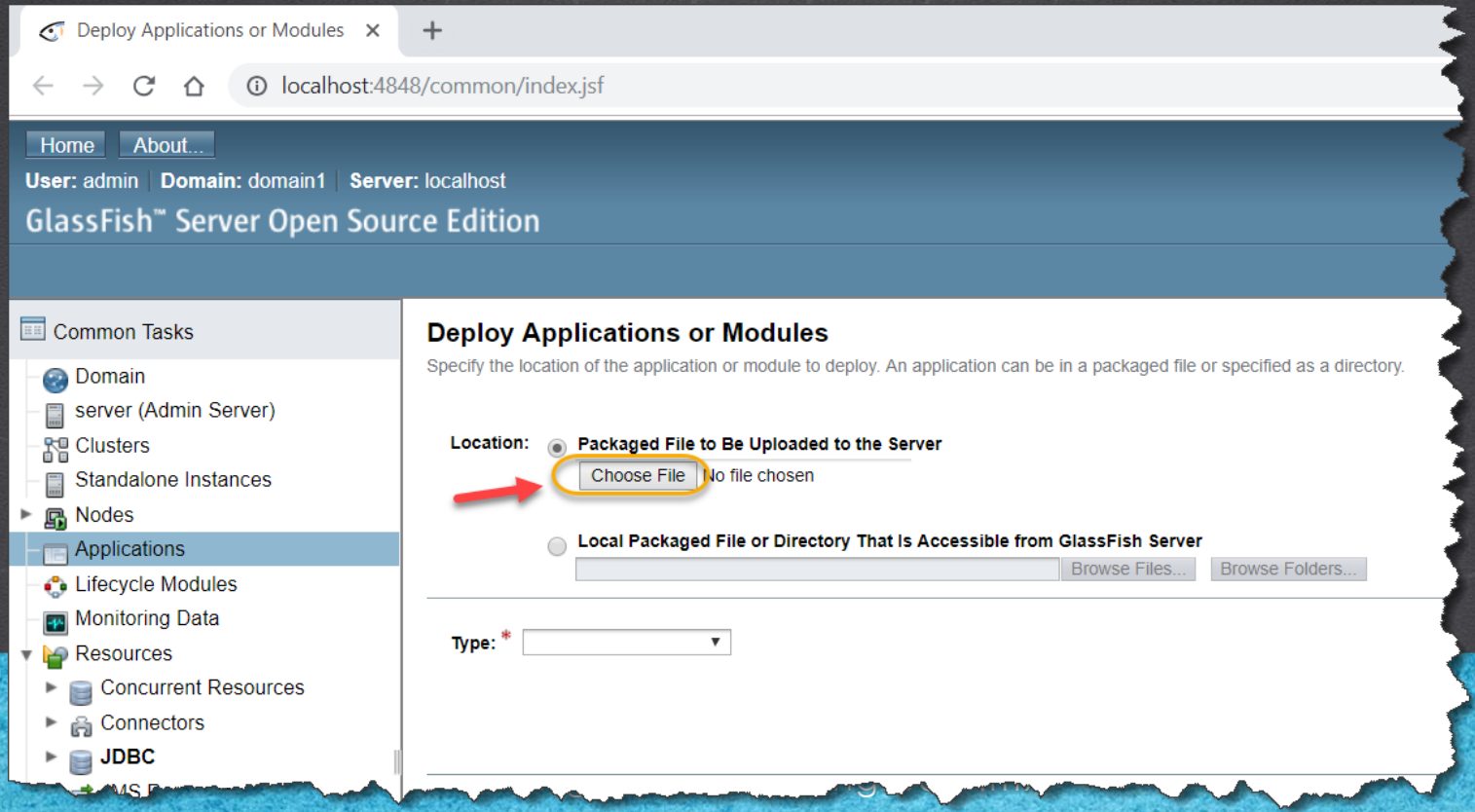
10. DEPLOY THE APPLICATION

We deployed the .jar application in Glassfish. We go to:
Applications -> Deploy:



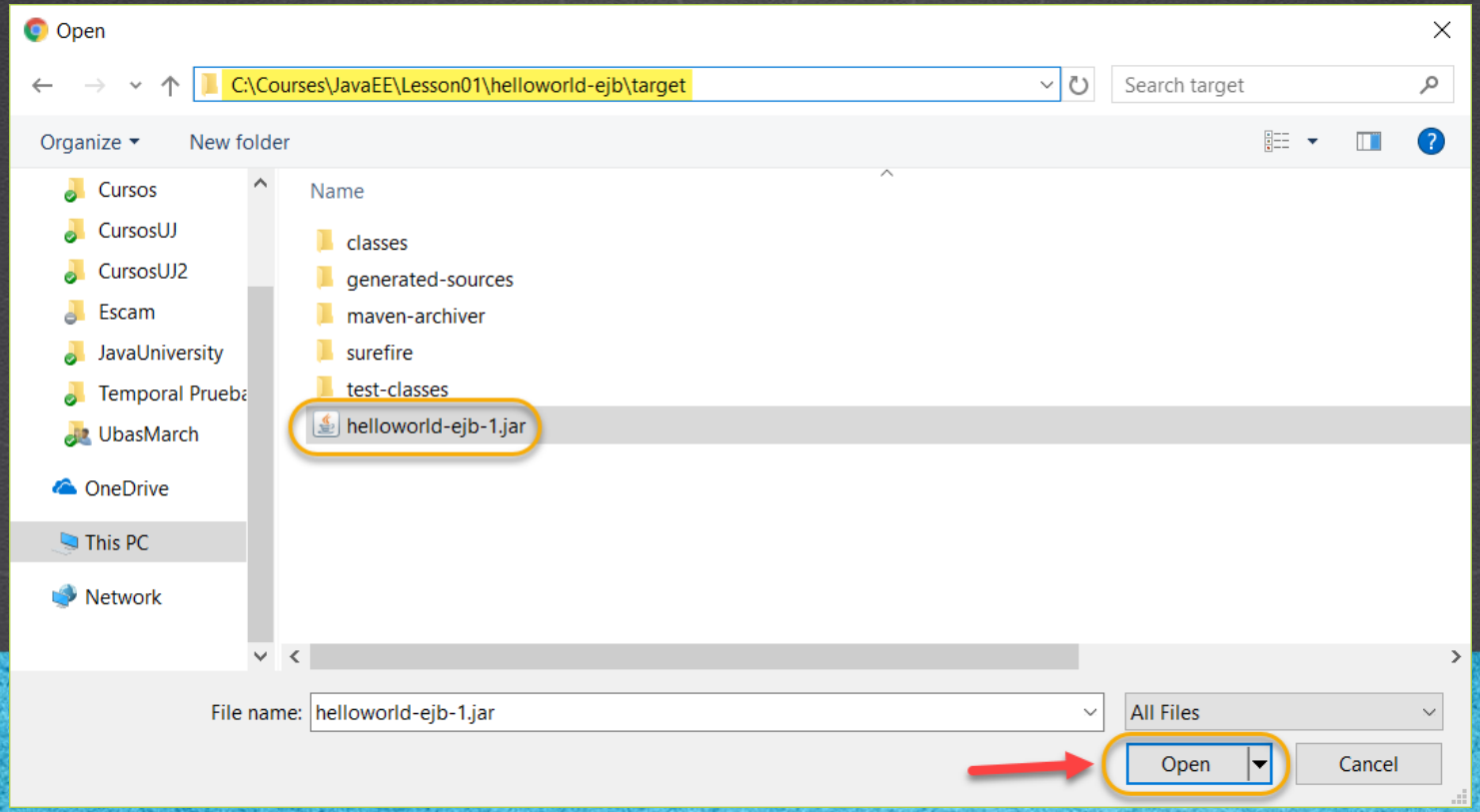
10. DEPLOY THE APPLICATION

We deployed the .jar application in Glassfish:



10. DEPLOY THE APPLICATION

Select the .jar file that were generated previously:



10. DEPLOY THE APPLICATION

Important: We change the name as shown and click on Ok:

Home | About... | Help

User: admin | Domain: domain1 | Server: localhost

GlassFish™ Server Open Source Edition

Tree

- Common Tasks
  - Domain
  - server (Admin Server)
  - Clusters
  - Standalone Instances
  - Nodes
  - Applications
  - Lifecycle Modules
  - Monitoring Data
  - Resources
    - Concurrent Resources
    - Connectors
    - JDBC
    - JMS Resources
    - JNDI

Deploy Applications or Modules

OK | Cancel

Specify the location of the application or module to deploy. An application can be in a packaged file or specified as a directory.

* Indicates required field

Location: Packaged File to Be Uploaded to the Server

Choose File helloworld-ejb-1.jar

Local Packaged File or Directory That Is Accessible from GlassFish Server

Browse Files... | Browse Folders...

Type: * EJB Jar

Application Name: * helloworld-ejb

Status: Enabled

Allows users to access the application.

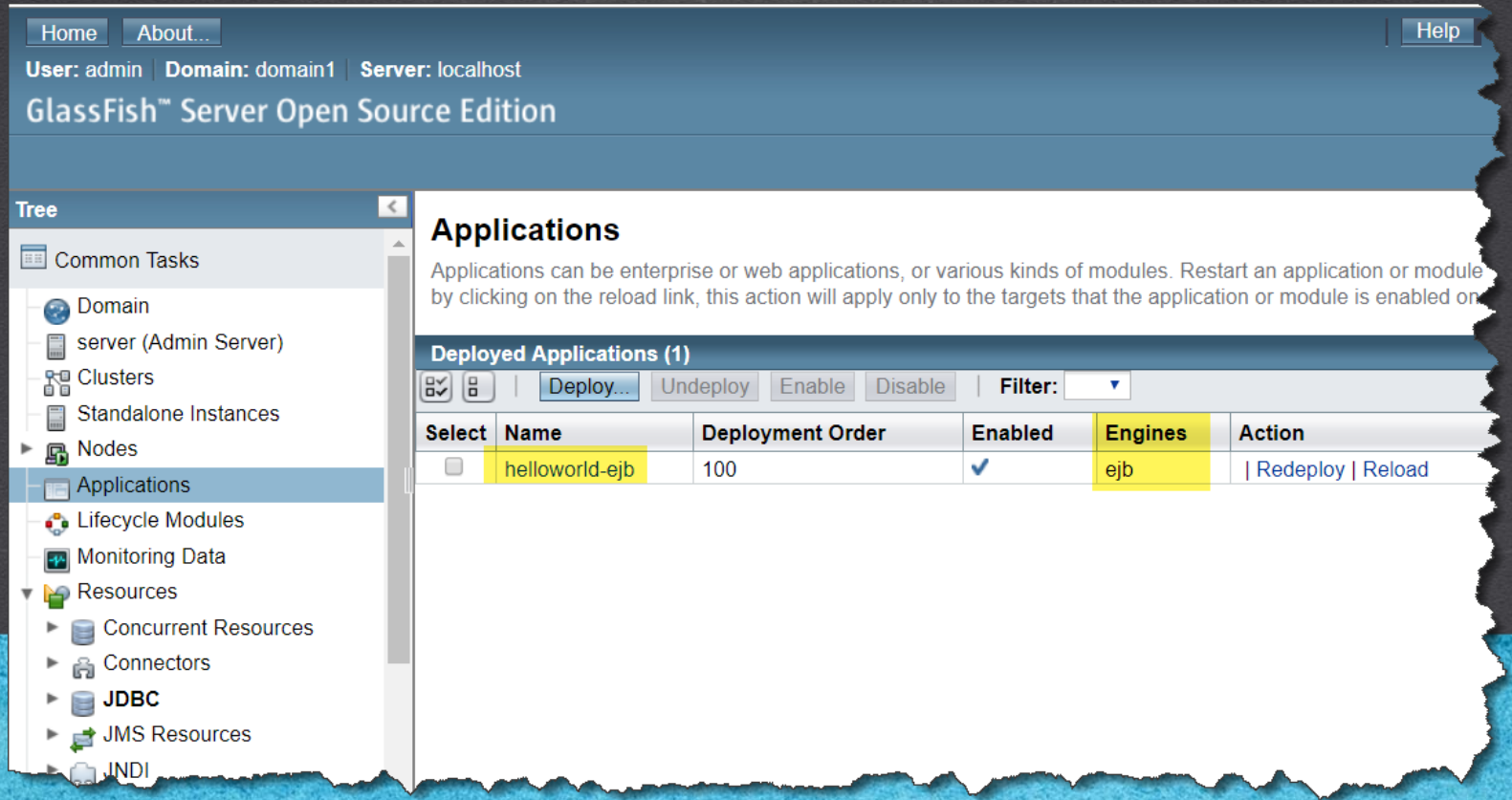
Implicit CDI Enabled

Implicit discovery of CDI beans

Important: Change the name as show:

10. DEPLOY THE APPLICATION

We deployed the .jar application in Glassfish:



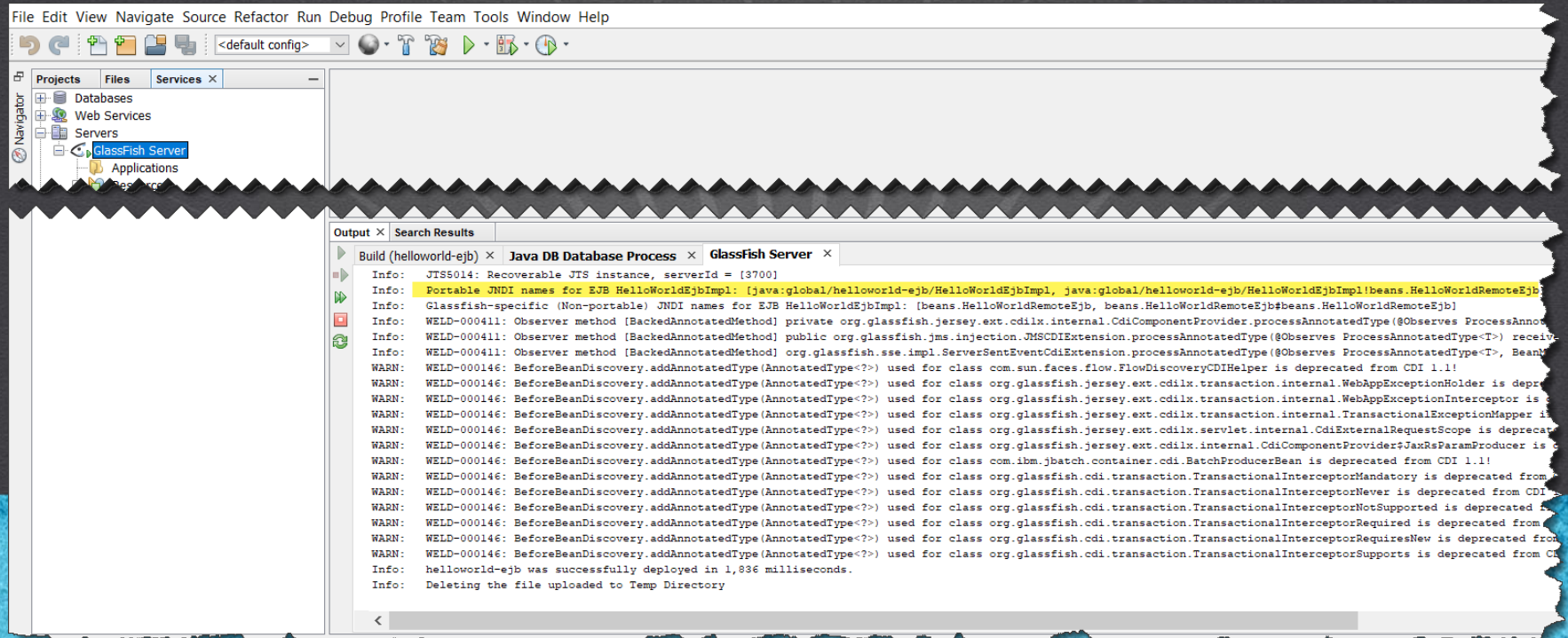
11. OBSERVED THE NAMES OF THE EJB

We observe in the log of Glassfish, the names as we can use from a client and thus obtain a reference of the EJB of type Stateless that we have just deployed in Glassfish:

Portable JNDI names for EJB HelloWorldEjbImpl:

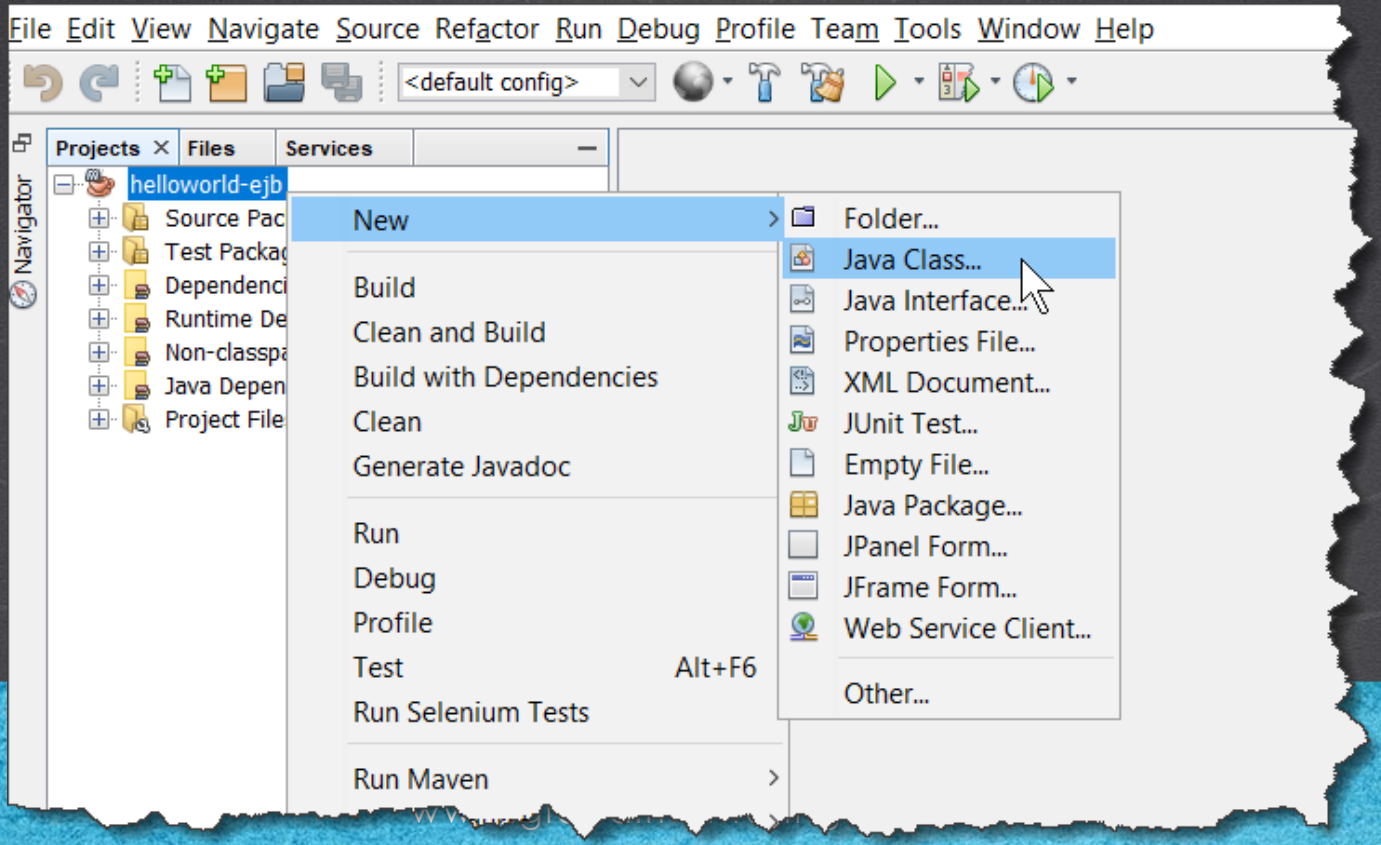
java:global/helloworld-ejb/HelloWorldEjbImpl

java:global/helloworld-ejb/HelloWorldEjbImpl!beans.HelloWorldRemoteEjb



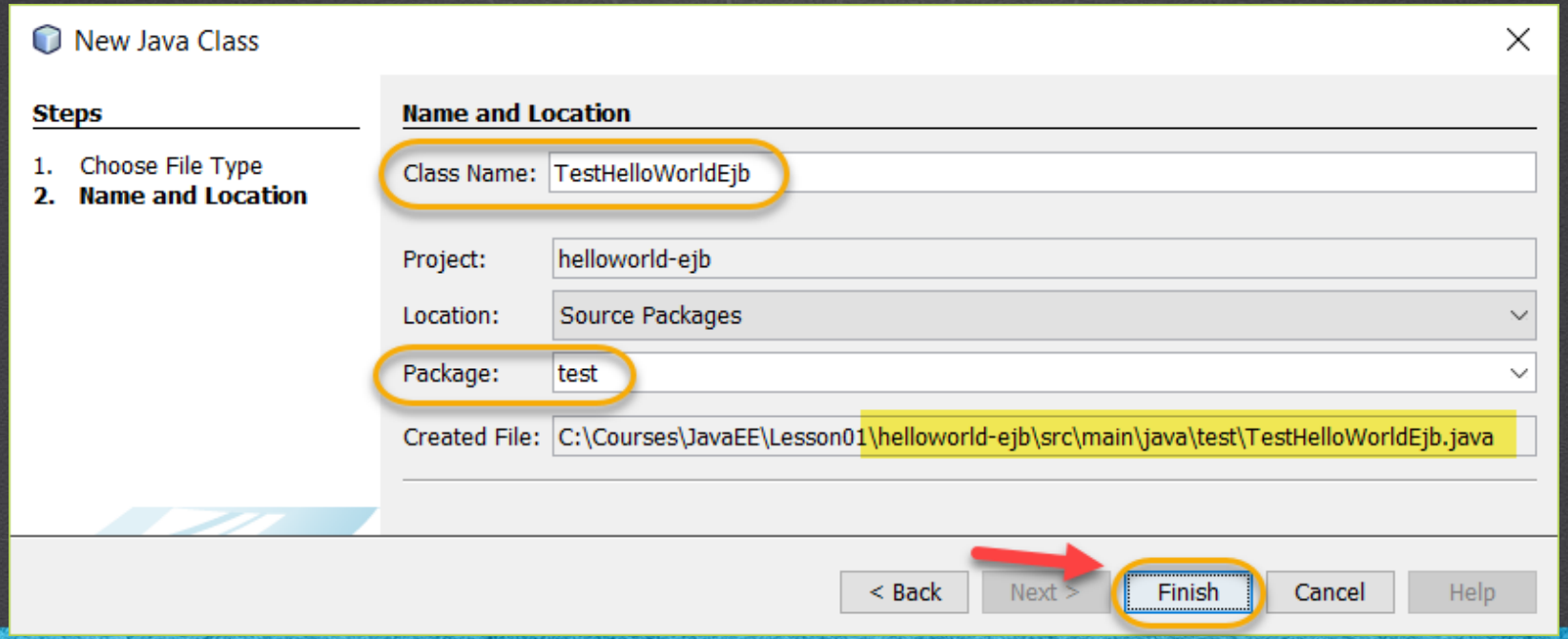
12. CREATE A JAVA CLASS

We create the TestHelloWorldEJB test class:



12. CREATE A NEW JAVA CLASS

We create the TestHelloWorldEJB test class:



13. MODIFY THE FILE

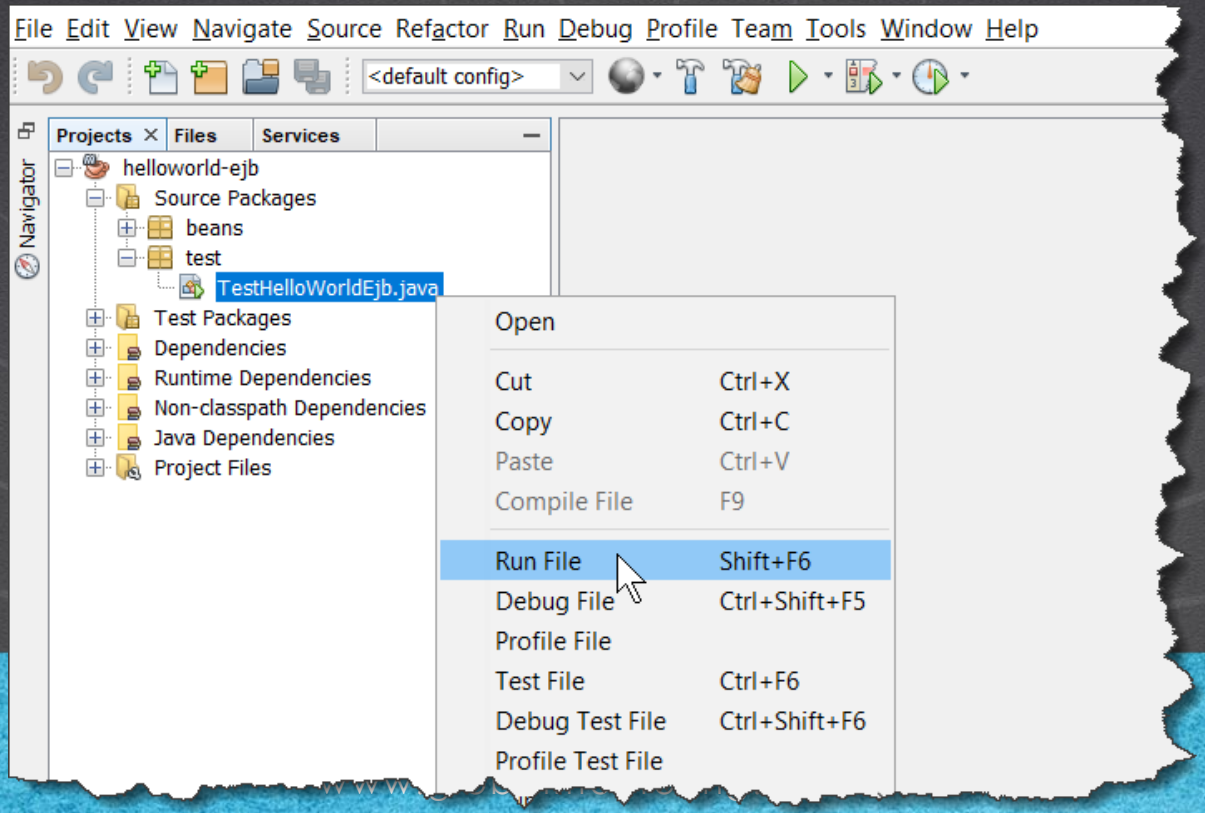
TestHelloWorldEjb.java:

Click to download

```java
package test;

import beans.HelloWorldRemoteEjb;
import javax.naming.*;

public class TestHelloWorldEjb {

    public static void main(String[] args) {
        System.out.println("Initiating EJB call from the client\n");
        try {
            Context jndi = new InitialContext();
            HelloWorldRemoteEjb helloWorldEjb =
                    (HelloWorldRemoteEjb) jndi.lookup("java:global/helloworld-ejb/HelloWorldEjbImpl!beans.HelloWorldRemoteEjb");
            int result = helloWorldEjb.add(5, 3);
            System.out.println("EJB Result of adding 5 + 3 = " + result);
        } catch (NamingException e) {
            e.printStackTrace(System.out);
        }
    }
}
```

14. EXECUTE THE CLASS

Execute the TestHelloWorldEjb.java. Glassfish must be running:



14. EXECUTE THE PROJECT

We execute the project. We see the result of executing the call to the EJB in the log:

Output | Search Results

Java DB Database Process | GlassFish Server | Run (TestHelloWorldEjb)

```
--- exec-maven-plugin:1.2.1:exec (default-cli) @ helloworld-ejb ---
Initiating EJB call from the client

EJB Result of adding 5 + 3 = 8
------------------------------------------------------------------------
BUILD SUCCESS
------------------------------------------------------------------------
Total time: 5.007s
Finished at: Mon Oct 15 20:23:44
Final Memory: 17M/489M
------------------------------------------------------------------------
```

log from the client

14. EXECUTE THE PROJECT

We execute the project. We see the result of executing the call to the EJB in the log:

OBSERVATIONS IN CASE OF PROBLEMS

If for some reason the execution of the project does not work, we recommend you perform the following actions:

1) The Glassfish server must be running in order to access the remote EJB.
2) Remember that any change in the EJB or the interface has to redeploy the .jar file in Glassfish server, since the changes are not published automatically (Select the application and do undeploy and redo deploy in Glassfish)
3) Check that in step 10 the application was renamed at the time of deploying it in Glassfish (helloworld-ejb).
4) If none of this works, try loading the resolved project, which is 100% functional.

EXERCISE CONCLUSION

- With this exercise we have put into practice the Hello World with EJB's.
- We use several technologies to simplify this exercise such as Maven and Glassfish Java application server.
- These are some of the tools that we will be using throughout the course, and as we move forward we will become familiar with each of them.

ONLINE

JAVA EE

By: Eng. Ubaldo Acosta

JAVA EE COURSE

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