

# Maven实战

## 本节目标

1.掌握Maven项目的创建 2.掌握使用Maven构建项目

## 1. Maven创建普通Java项目

### 1.1 创建项目

运行命令：

```
mvn -B archetype:generate -DarchetypeGroupId=org.apache.maven.archetypes -  
DarchetypeArtifactId=maven-archetype-quickstart -DarchetypeVersion=1.1 -  
DgroupId=com.bittech.hello -DartifactId=hello-app -Dversion=1.0.0
```

运行输出：

```
λ mvn -B archetype:generate -DarchetypeGroupId=org.apache.maven.archetypes -  
DarchetypeArtifactId=maven-archetype-quickstart -DarchetypeVersion=1.1 -  
DgroupId=com.bittech.hello -DartifactId=hello-app -Dversion=1.0.0  
[INFO] Scanning for projects...  
[INFO]  
[INFO] -----  
[INFO] Building Maven Stub Project (No POM) 1  
[INFO] -----  
[INFO]  
[INFO] >>> maven-archetype-plugin:3.0.1:generate (default-cli) > generate-sources @  
standalone-pom >>>  
[INFO]  
[INFO] <<< maven-archetype-plugin:3.0.1:generate (default-cli) < generate-sources @  
standalone-pom <<<  
[INFO]  
[INFO]  
[INFO] --- maven-archetype-plugin:3.0.1:generate (default-cli) @ standalone-pom ---  
[INFO] Generating project in Batch mode  
[WARNING] No archetype found in remote catalog. Defaulting to internal catalog  
[INFO] Archetype repository not defined. Using the one from  
[org.apache.maven.archetypes:maven-archetype-quickstart:1.1] found in catalog internal  
[INFO] -----  
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-  
archetype-quickstart:1.1  
[INFO] -----  
[INFO] Parameter: basedir, value: F:\__bittech\java-courseware\java-special-  
subject\Maven\project  
[INFO] Parameter: package, value: com.bittech.hello  
[INFO] Parameter: groupId, value: com.bittech.hello  
[INFO] Parameter: artifactId, value: hello-app
```

```
[INFO] Parameter: packageName, value: com.bittech.hello
[INFO] Parameter: version, value: 1.0.0
[INFO] project created from Old (1.x) Archetype in dir: F:\__bittech\java-
courseware\java-special-subject\Maven\project\hello-app
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 5.022 s
[INFO] Finished at: 2017-11-26T21:26:30+08:00
[INFO] Final Memory: 16M/139M
[INFO] -----
```

项目目录结构:

```
输入 tree . /F
卷 workspace 的文件夹 PATH 列表
卷序列号为 C0000100 0005:1A4F
F:\__BITTECH\JAVA-COURSEWARE\JAVA-SPECIAL-SUBJECT\MAVEN\PROJECT\HELLO-APP
| pom.xml
|
└─src
    ├──main
    │   ├──java
    │   │   ├──com
    │   │   │   ├──bittech
    │   │   │   │   ├──hello
    │   │   │   │   │   App.java
    │   │   │   │   │
    │   │   │   │   └─test
    │   │   │   │       ├──java
    │   │   │   │       │   ├──com
    │   │   │   │       │   │   ├──bittech
    │   │   │   │       │   │   │   ├──hello
    │   │   │   │       │   │   │   │   AppTest.java
```

其中App.java中的代码如下:

```
package com.bittech.hello;
public class App {
    public static void main( String[] args ){
        System.out.println( "Hello world!" );
    }
}
```

## 1.2 编译源代码

运行命令:

```
mvn compile
```

运行输出:

输入 mvn compile

```
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building hello-app 1.0.0
[INFO] -----
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ hello-app ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ hello-app ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 3.382 s
[INFO] Finished at: 2017-11-26T21:31:22+08:00
[INFO] Final Memory: 13M/139M
[INFO] -----
```

输出目录：Maven命令产生的输出文件都在当前工程目录下的 target 目录。

输入 tree . /F

卷 workspace 的文件夹 PATH 列表

卷序列号为 C0000100 0005:1A4F

F:\\_\_BITTECH\JAVA-COURSEWARE\JAVA-SPECIAL-SUBJECT\MAVEN\PROJECT\HELLO-APP

```
| pom.xml
|
|--src
|   |--main
|   |   |--java
|   |   |   |--com
|   |   |   |   |--bittech
|   |   |   |   |   |--hello
|   |   |   |   |       App.java
|   |   |--test
|   |       |--java
|   |           |--com
|   |               |--bittech
|   |                   |--hello
|   |                       AppTest.java
|
|--target
    |--classes
    |   |--com
    |       |--bittech
    |           |--hello
```

```
|
|
└─maven-status
    └─maven-compiler-plugin
        └─compile
            └─default-compile
                createdFiles.lst
                inputFiles.lst
```

## 1.3 编译测试代码

运行命令：

```
mvn test-compile
```

运行输出：

```
λ mvn test-compile
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building hello-app 1.0.0
[INFO] -----
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ hello-app ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ hello-app ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\classes
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ hello-app -
--
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ hello-app ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\test-classes
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 3.025 s
[INFO] Finished at: 2017-11-26T21:40:21+08:00
[INFO] Final Memory: 14M/133M
[INFO] -----
```

## 1.4 运行单元测试

运行命令：

```
mvn test
```

运行输出：

```
λ mvn test
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building hello-app 1.0.0
[INFO] -----
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ hello-app ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ hello-app ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ hello-app -
--
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ hello-app ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-surefire-plugin:2.12.4:test (default-test) @ hello-app ---
[INFO] Surefire report directory: F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\surefire-reports

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

Running com.bittech.hello.AppTest
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.023 sec

Results :

Tests run: 1, Failures: 0, Errors: 0, Skipped: 0

[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 3.107 s
[INFO] Finished at: 2017-11-26T21:42:43+08:00
[INFO] Final Memory: 11M/114M
```

[INFO]

## 1.4 打包工程

运行命令：

```
mvn package
```

运行输出：

```
λ mvn package
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building hello-app 1.0.0
[INFO] -----
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ hello-app ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ hello-app ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\classes
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ hello-app -
--
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ hello-app ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\test-classes
[INFO]
[INFO] --- maven-surefire-plugin:2.12.4:test (default-test) @ hello-app ---
[INFO] Surefire report directory: F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\surefire-reports

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

Running com.bittech.hello.AppTest
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.012 sec

Results :

Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
```

```
[INFO]
[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ hello-app ---
[INFO] Building jar: F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\hello-app-1.0.0.jar
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 4.734 s
[INFO] Finished at: 2017-11-26T21:48:58+08:00
[INFO] Final Memory: 16M/134M
[INFO] -----
```

运行打包命令之后，会在 `target` 目录下生成构件（`hello-app-1.0.0.jar`）构件名称由：`artifactId-version.packaging` 组成。

## 1.5 安装构件到本地仓库

运行命令：

```
mvn install
```

运行输出：

此处忽略编译代码，运行单元测试的输出

```
[INFO]
[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ hello-app ---
[INFO] Building jar: F:\__bittech\java-courseware\java-special-
subject\Maven\project\hello-app\target\hello-app-1.0.0.jar
[INFO]
[INFO] --- maven-install-plugin:2.4:install (default-install) @ hello-app ---
[INFO] Installing F:\__bittech\java-courseware\java-special-subject\hello-
app\target\hello-app-1.0.0.jar to D:\__repository\com\bittech\hello\hello-
app\1.0.0\hello-app-1.0.0.jar
[INFO] Installing F:\__bittech\java-courseware\java-special-subject\Maven\project\hello-
app\pom.xml to D:\__repository\com\bittech\hello\hello-app\1.0.0\hello-app-1.0.0.pom
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 5.257 s
[INFO] Finished at: 2017-11-26T21:56:37+08:00
[INFO] Final Memory: 16M/140M
[INFO] -----
```

## 1.6 发布构件到仓库服务

- 中央仓库
  - 申请中央仓库帐号
  - `settings` 中配置仓库服务的认证信息
  - `pom.xml` 设置发布仓库地址
  - 向中央仓库申请发布构件

- 申请通过之后, 进行构件发布
- 公司私服
  - 申请公司私服帐号
  - settings 中配置仓库服务的认证信息
  - pom.xml 设置发布仓库地址
  - 发布构件
- 配置操作

pom.xml 中的配置信息

```
<distributionManagement>
  <repository>
    <id>mycompany-repository</id>
    <name>MyCompany Repository</name>
    <url>scp://repository.mycompany.com/repository/maven2</url>
  </repository>
</distributionManagement>
```

settings.xml 中配置信息

```
<servers>
  <server>
    <id>mycompany-repository</id>
    <username>jvanzyl</username>
    <!-- Default value is ~/.ssh/id_dsa -->
    <privateKey>/path/to/identity</privateKey> (default is ~/.ssh/id_dsa)
    <passphrase>my_key_passphrase</passphrase>
  </server>
</servers>
```

- 发布构件

```
mvn deploy
```

## 1.7 构建可执行的jar构件

可执行的jar构件是指可以通过java命令来执行运行jar构件, 类似与window下的exe,linux下的sh。

在1.4中我们打包输出的 hello-app-1.0.0.jar 通过执行 `java -jar hello-app-1.0.0.jar` 输出信息如下:

```
F:\__bittech\java-courseware\java-special-subject\Maven\project\hello-app\target
λ ll
total 4
drwxr-xr-x 1 ZhangXiao 197121    0 Nov 26 22:30 classes
-rw-r--r-- 1 ZhangXiao 197121 2340 Nov 26 22:30 hello-app-1.0.0.jar
drwxr-xr-x 1 ZhangXiao 197121    0 Nov 26 22:30 maven-archiver
drwxr-xr-x 1 ZhangXiao 197121    0 Nov 26 22:30 maven-status
drwxr-xr-x 1 ZhangXiao 197121    0 Nov 26 22:30 surefire-reports
drwxr-xr-x 1 ZhangXiao 197121    0 Nov 26 22:30 test-classes
```



```
F:\__bittech\java-courseware\java-special-subject\Maven\project\hello-app\target
λ java -jar hello-app-1.0.0.jar
hello-app-1.0.0.jar中没有主清单属性

F:\__bittech\java-courseware\java-special-subject\Maven\project\hello-app\target
λ
```

从输出日志中可以看出，我们打包输出的jar是没有主类的，可以理解为java命令没有找到其中带main方法的类。但是根据1.1中的目录和类信息，我们知道工程中是有主类的，那么下面我们就需要在 `pom.xml` 中指定在打包的时候添加主清单信息。

```
<build>
  <plugins>
    <plugin>
      <groupId>org.apache.maven.plugins</groupId>
      <artifactId>maven-jar-plugin</artifactId>
      <version>2.4</version>
      <configuration>
        <archive>
          <manifest>
            <addClasspath>true</addClasspath>
            <mainClass>com.bittech.hello.App</mainClass>
            <addExtensions>true</addExtensions>
          </manifest>
          <manifestEntries>
            <Implementation-Title>${project.name}</Implementation-Title>
            <Implementation-Version>${project.version}</Implementation-
Version>
            <Implementation-Vendor-Id>${project.groupId}</Implementation-
Vendor-Id>
          </manifestEntries>
        </archive>
      </configuration>
    </plugin>
  </plugins>
</build>
```

执行打包命令，然后通过java命令执行jar

```
mvn package
java -jar target\hello-app-1.0.0.jar
Hello world!
```

从上面输出信息可以看出，我们打包输出的jar现在可以通过java命令执行执行了。

## 2. Maven创建Java Web项目

maven创建web项目和应用项目不同的是web项目的打包类型通常是 `war`，以及web项目的目录中有 `webapp` 目录用来归档web页面。

### 2.1 选择maven-archetype-webapp的原型创建web项目

```
mvn -B archetype:generate -DarchetypeGroupId=org.apache.maven.archetypes -  
DarchetypeArtifactId=maven-archetype-webapp -DarchetypeVersion=1.0 -  
DgroupId=com.bittech.hello -DartifactId=hello-webapp -Dversion=1.0.0
```

## 2.2 目录信息

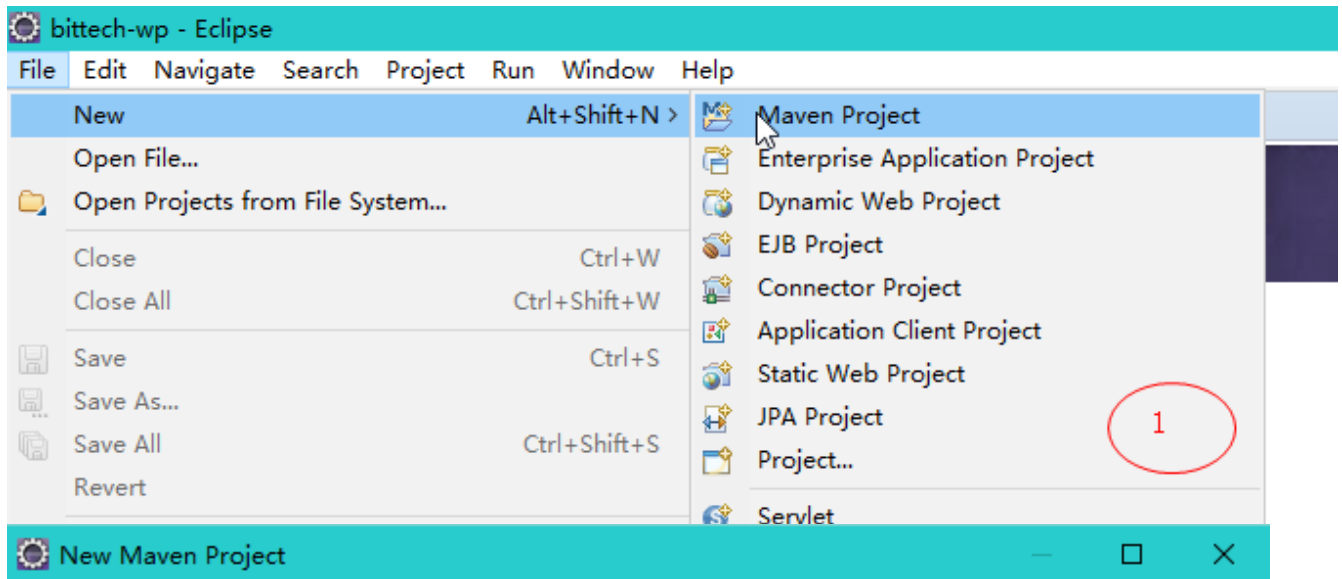
```
λ tree . /F  
卷 workspace 的文件夹 PATH 列表  
卷序列号为 C0000100 0005:1A4F  
F:\__BITTECH\JAVA-COURSEWARE\JAVA-SPECIAL-SUBJECT\MAVEN\PROJECT\HELLO-WEBAPP  
| pom.xml  
|  
└─src  
    └─main  
        └─resources  
            └─webapp  
                | index.jsp  
                |  
                └─WEB-INF  
                    web.xml
```

## 2.3 其它命令操作和1.1-1.6相同

# 3. 通过IDE创建Maven项目

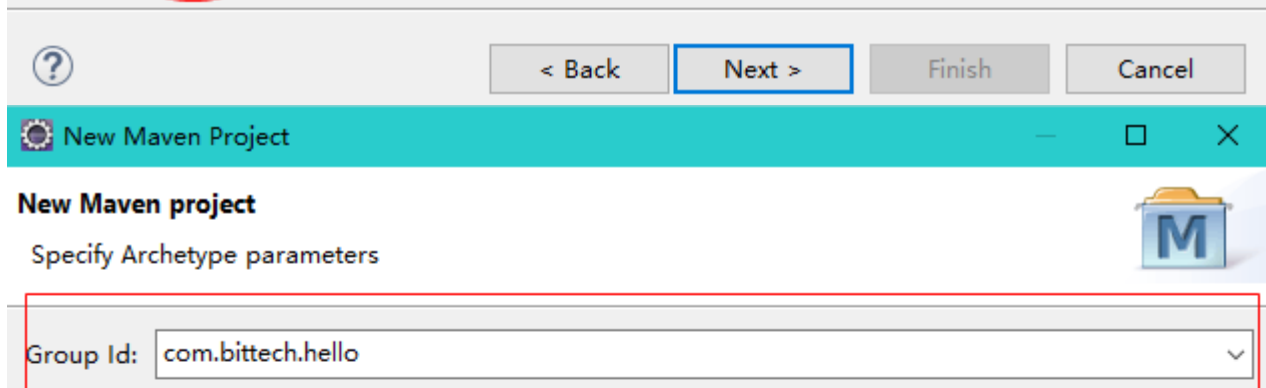
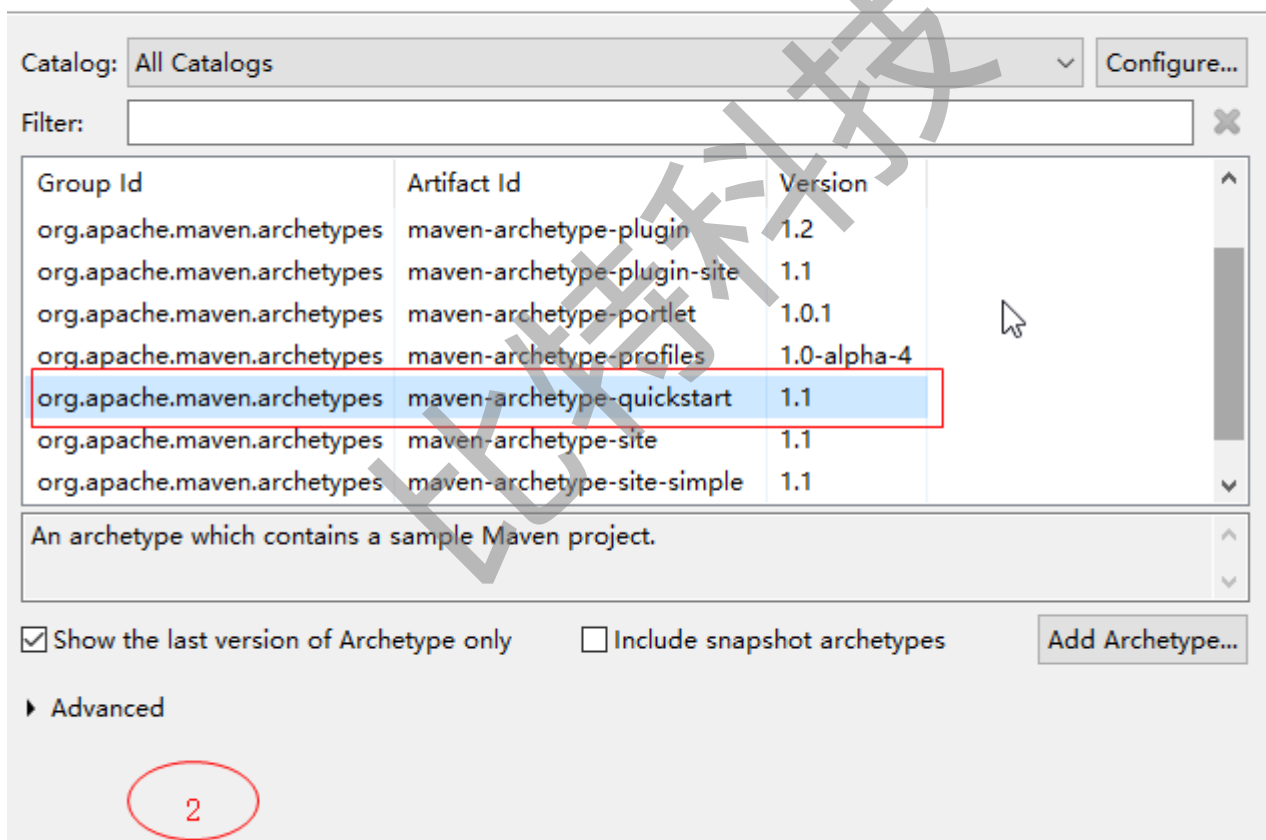
## 3.1 Eclipse

比特科技



## New Maven project

Select an Archetype



Artifact Id: hello-app

Version: 0.0.1

Package: com.bittech.hello

Properties available from archetype:

Name	Value

Advanced

3

< Back Next Finish Cancel

bittech-wp - hello-app/pom.xml - Eclipse

File Edit Source Navigate Search Project Run Window Help

Project Explorer

- hello-app
  - src/main/java
    - com.bittech.hello
      - App.java
  - src/test/java
    - com.bittech.hello
      - AppTest.java
  - JRE System Library [J2SE-1.5]
  - Maven Dependencies
    - junit-3.8.1.jar - D:\\_repository\junit\junit3
  - src
  - target
  - pom.xml

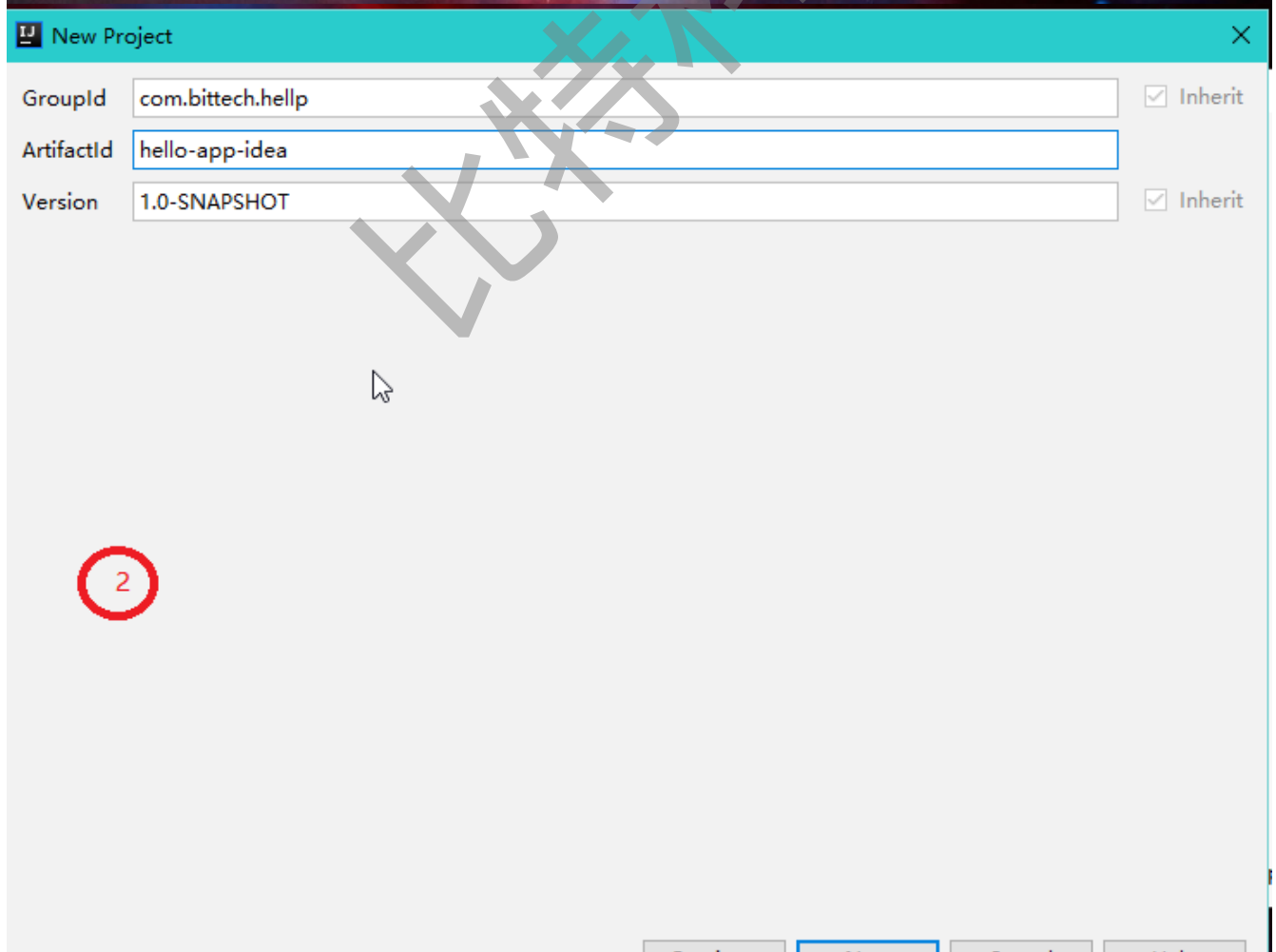
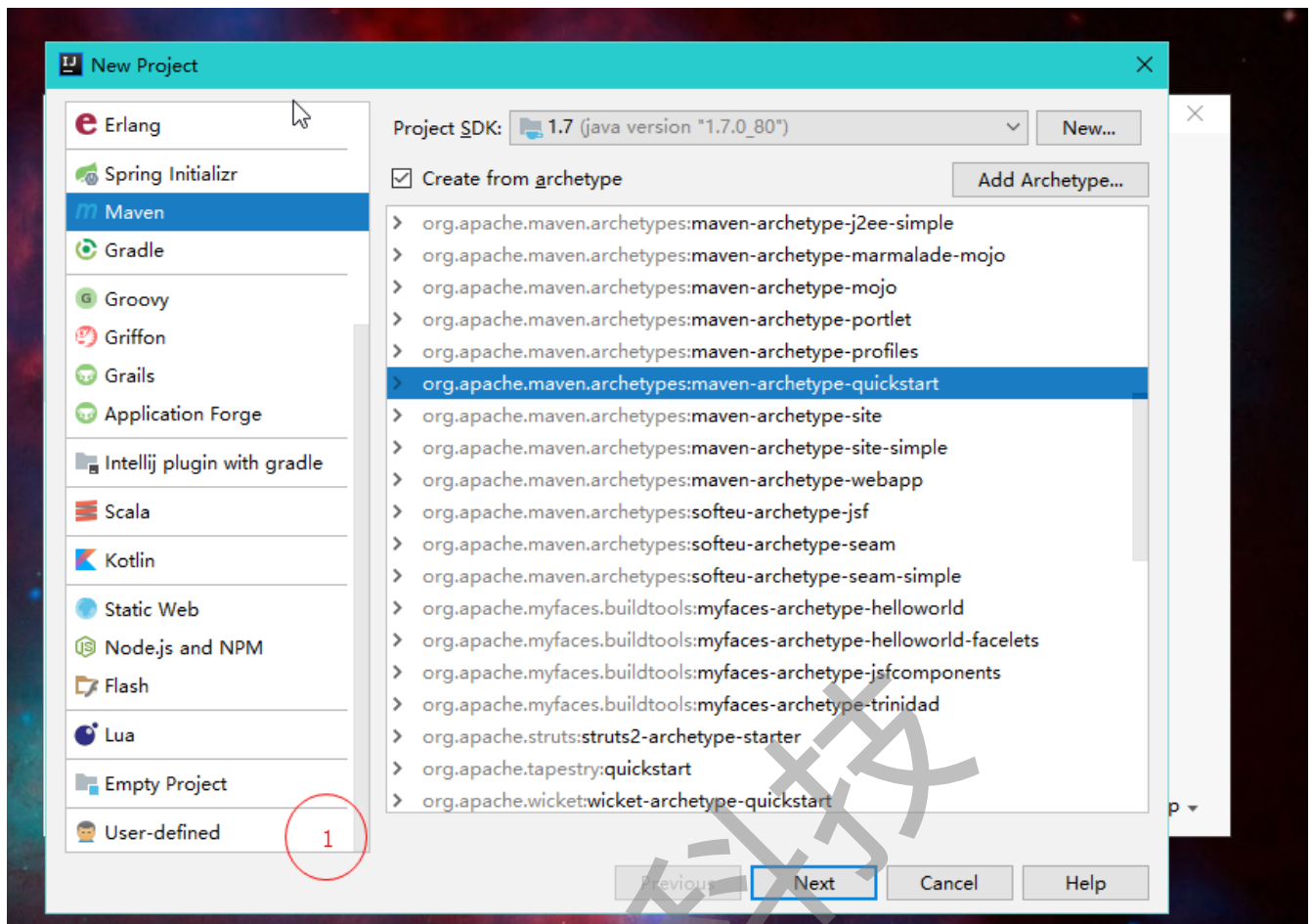
hello-app/pom.xml

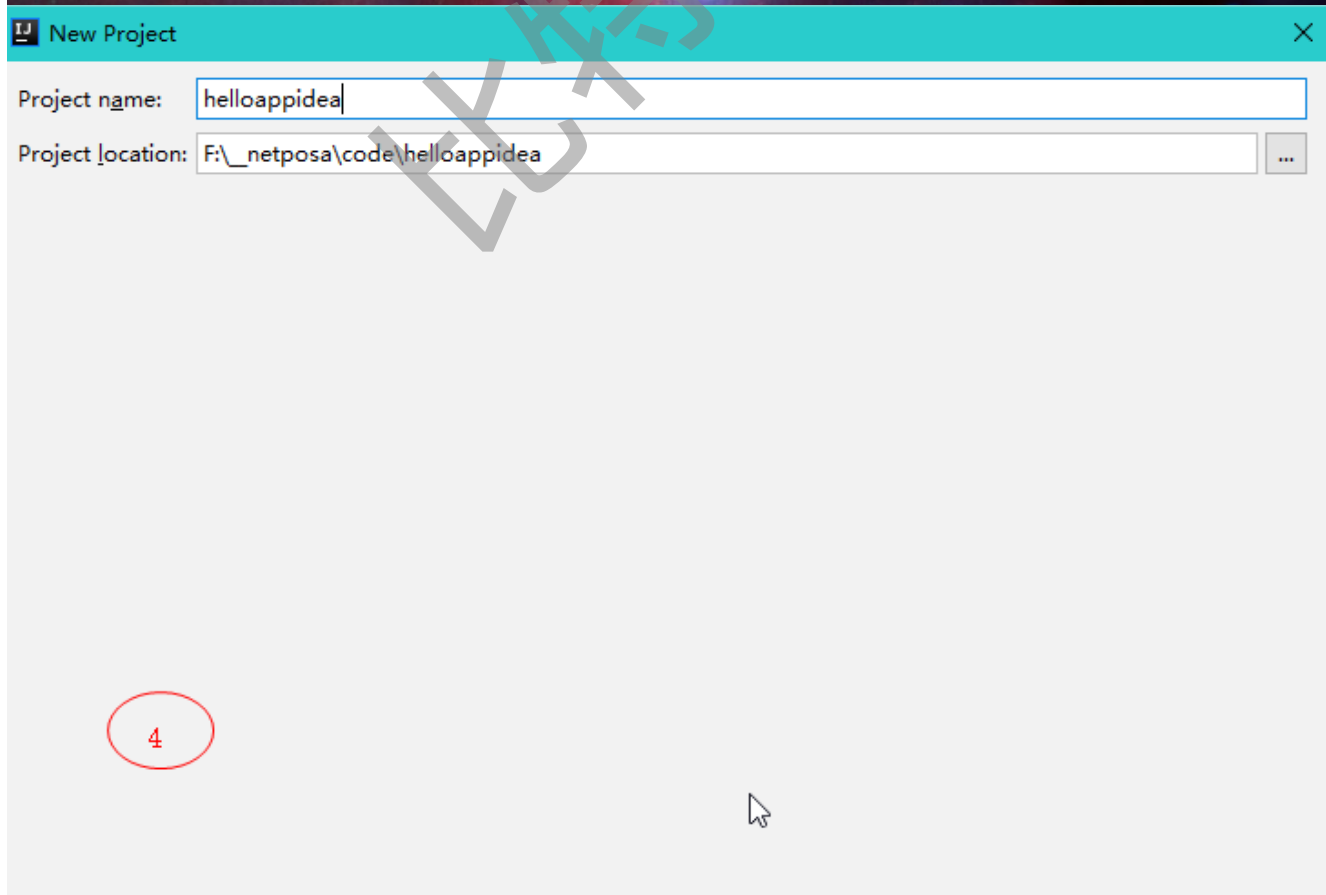
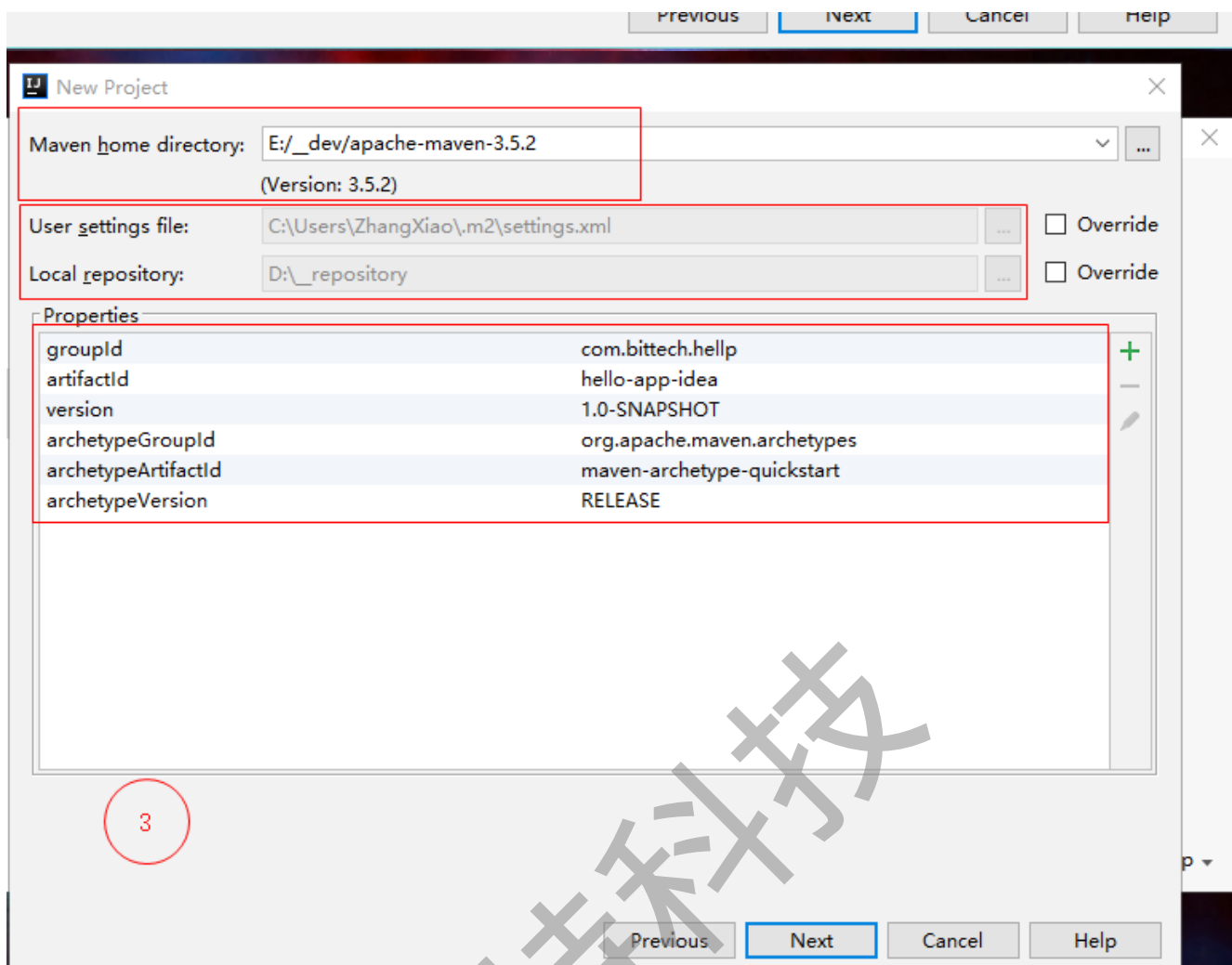
```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
3   xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
4   <modelVersion>4.0.0</modelVersion>
5   <groupId>com.bittech.hello</groupId>
6   <artifactId>hello-app</artifactId>
7   <version>0.0.1</version>
8   <packaging>jar</packaging>
9
10  <name>hello-app</name>
11  <url>http://maven.apache.org</url>
12
13  <properties>
14    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
15  </properties>
16
17  <dependencies>
18    <dependency>
19      <groupId>junit</groupId>
20      <artifactId>junit</artifactId>
21      <version>3.8.1</version>
22      <scope>test</scope>
23    </dependency>
24  </dependencies>
25 </project>
26
```

4

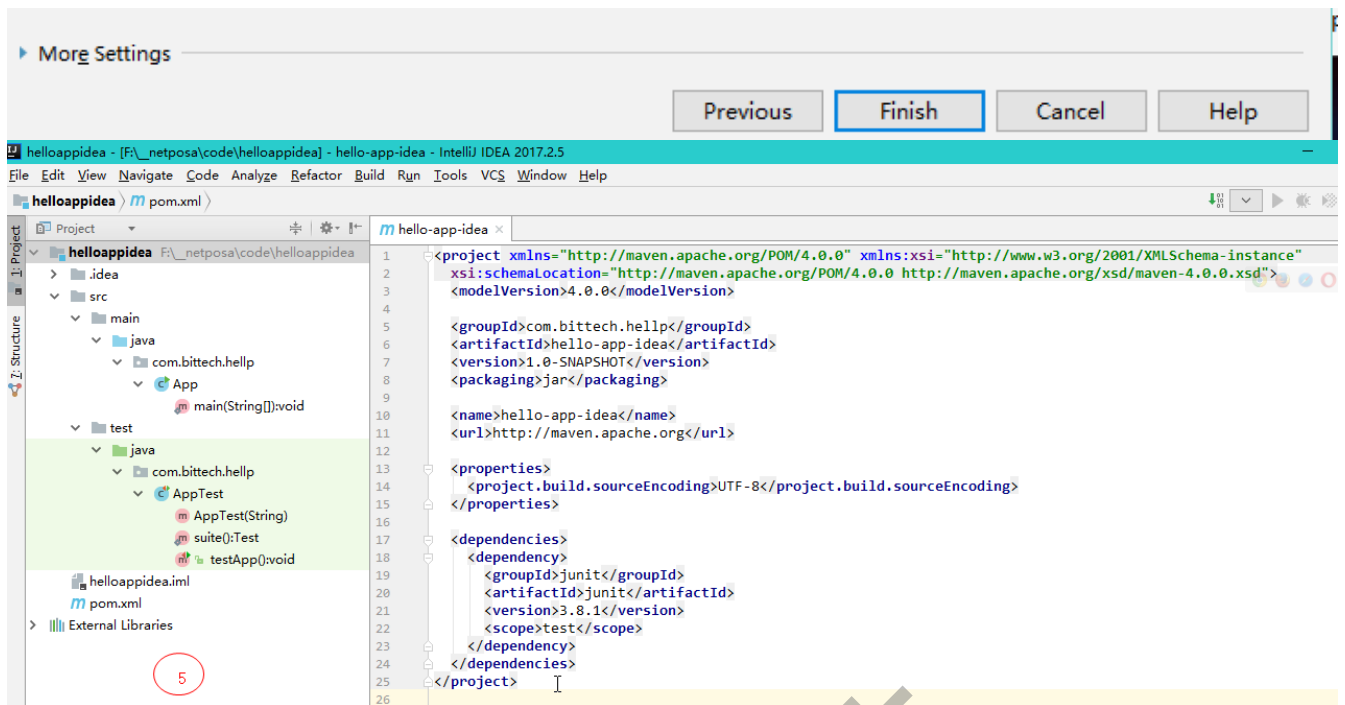
## 3.2 IDEA

比特科技









## 4. Maven常用操作

- `mvn clean` 清理构建目录
- `mvn compile` 编译源代码
- `mvn test-compile` 编译测试代码
- `mvn test` 运行单元测试
- `mvn package` 运行打包
- `mvn install` 运行安装，生成的构建存储到本地仓库
- `mvn clean package` 清理然后打包
- `mvn clean package -Dmaven.test.skip=true` 清理然后打包，但是跳过测试阶段
- `mvn site` 生成项目站点

## 课后作业

- 通过IDE（Eclipse或者IDEA）创建一个Hello工程，构建输出可执行的jar

## 扩展阅读

- [Maven工程多模块继承和聚合的创建](#)