Maven learning note (0)

0, maven 存在的意义

1.1、假如你正在Eclipse下开发两个Java项目，姑且把它们称为A、B，其中A项目中的一些功能依赖于B项目中的某些类，那么如何维系这种依赖关系的呢？

很简单，这不就是跟我们之前写程序时一样吗，需要用哪个项目中的哪些类，也就是用别人写好了的功能代码，导入jar包即可。所以这里也如此，可以将B项目打成jar包，然后在A项目的Library下导入B的jar文件，这样，A项目就可以调用B项目中的某些类了。

这样做几种缺陷,如果在开发过程中，发现B中的bug，则必须将B项目修改好，并重新将B打包并对A项目进行重编译操作,在完成A项目的开发后，为了保证A的正常运行，就需要依赖B(就像在使用某个jar包时必须依赖另外一个jar一样)，两种解决方案，第一种，选择将B打包入A中，第二种，将B也发布出去，等别人需要用A时，告诉开发者，想要用A就必须在导入Bjar包。两个都很麻烦，前者可能造成资源的浪费(比如，开发者可能正在开发依赖B的其它项目，B已经存储到本地了，在导入A的jar包的话，就有了两个B的jar)，后者是我们常遇到的，找各种jar包，非常麻烦(有了maven就不一样了)

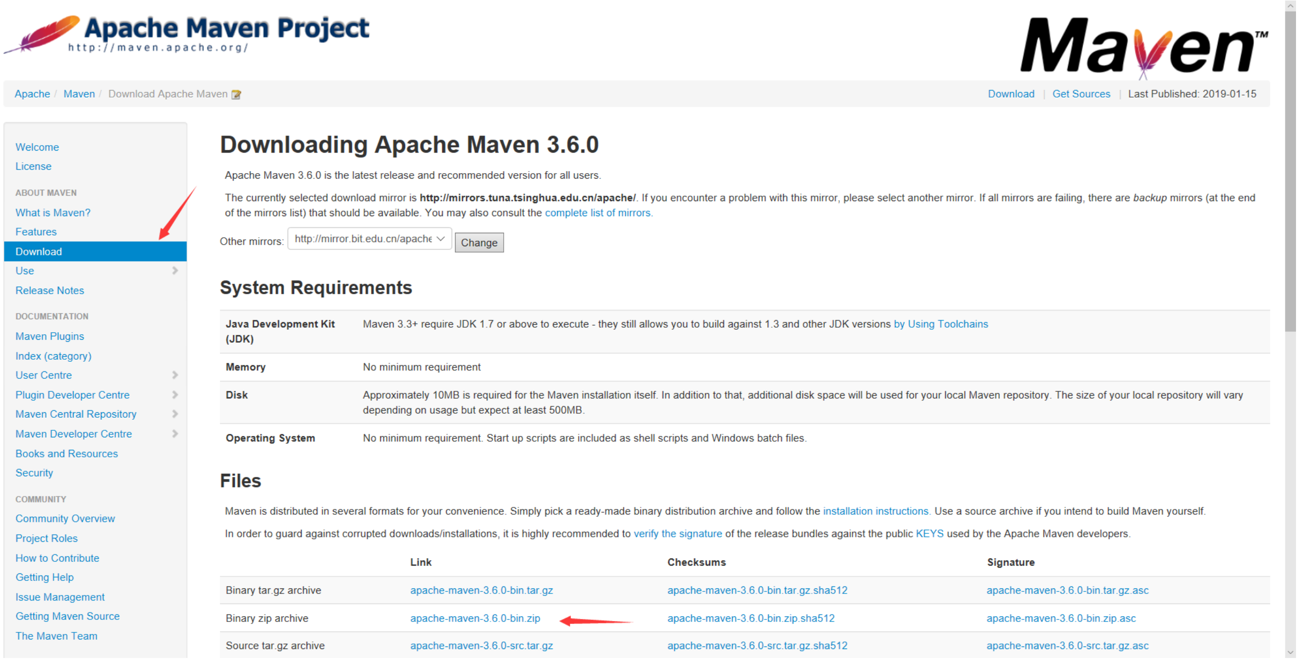
1.2、我们开发一个项目，或者做一个小demo，比如用SSH框架，那么我们就必须将SSH框架所用的几十个依赖的jar包依次找出来并手动导入，超级繁琐。 上面两个问题的描述，其实都属于项目与项目之间依赖的问题[A项目使用SSH的所有jar，就说A项目依赖SSH]，人为手动的去解决，很繁琐，也不方便，所以使用maven来帮我们管理

so

Maven是基于项目对象模型(POM project object model)，可以通过一小段描述信息（配置）来管理项目的构建，报告和文档的软件项目管理工具

1, maven 的安装

official website:http://maven.apache.org/



Apache / Maven / Download Apache Maven

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Downloading Apache Maven 3.6.0

Apache Maven 3.6.0 is the latest release and recommended version for all users.

The currently selected download mirror is **http://mirrors.tuna.tsinghua.edu.cn/apache/**. If you encounter a problem with this mirror, please select another mirror. If all mirrors are failing, there are *backup* mirrors (at the end of the mirrors list) that should be available. You may also consult the complete list of mirrors.

Other mirrors: http://mirror.bit.edu.cn/apache Change

System Requirements

Java Development Kit (JDK)	Maven 3.3+ require JDK 1.7 or above to execute - they still allows you to build against 1.3 and other JDK versions by Using Toolchains
Memory	No minimum requirement
Disk	Approximately 10MB is required for the Maven installation itself. In addition to that, additional disk space will be used for your local Maven repository. The size of your local repository will vary depending on usage but expect at least 500MB.
Operating System	No minimum requirement. Start up scripts are included as shell scripts and Windows batch files.

Files

Maven is distributed in several formats for your convenience. Simply pick a ready-made binary distribution archive and follow the installation instructions. Use a source archive if you intend to build Maven yourself.

In order to guard against corrupted downloads/installations, it is highly recommended to verify the signature of the release bundles against the public KEYS used by the Apache Maven developers.

	Link	Checksums	Signature
Binary tar.gz archive	apache-maven-3.6.0-bin.tar.gz	apache-maven-3.6.0-bin.tar.gz.sha512	apache-maven-3.6.0-bin.tar.gz.asc
Binary zip archive	apache-maven-3.6.0-bin.zip	apache-maven-3.6.0-bin.zip.sha512	apache-maven-3.6.0-bin.zip.asc
Source tar.gz archive	apache-maven-3.6.0-src.tar.gz	apache-maven-3.6.0-src.tar.gz.sha512	apache-maven-3.6.0-src.tar.gz.asc

1. 安装后设置环境变量 %M2_HOME% 为刚刚的文件目录
2. 添加环境变量路径，刚刚安装目录下的bin文件夹，在cmd下mvn -v查看测试安装是否成功

```
C:\Users\cwl>mvn -v
Apache Maven 3.6.0 (97c98ec64a1fdfee7767ce5ffb20918da4f719f3; 2018-10-25T02:41:47+08:00)
Maven home: F:\maven_learn\lib\apache-maven-3.6.0-bin\apache-maven-3.6.0\bin\..
Java version: 1.8.0_191, vendor: Oracle Corporation, runtime: C:\Program
Files\Java\jdk1.8.0_191\jre
Default locale: zh_CN, platform encoding: GBK
OS name: "windows 10", version: "10.0", arch: "amd64", family: "windows"
```

2, maven 初步

官方教程

maven 目录结构

```
my-app
|-- pom.xml
`-- src
    |-- main
    |   `-- java
    |       `-- com
    |           `-- mycompany
    |               `-- app
    |                   `-- App.java
    `-- test
        `-- java
            `-- com
                `-- mycompany
                    `-- app
                        `-- AppTest.java
```

maven 的 pom.xml

核心配置文件,在该目录下的 pom.xml, 在boot的jar里面

`plexus-classworlds-2.5.2.jar\META-INF\maven\org.codehaus.plexus\plexus-classworlds`

默认的pom.xml东西比较多，官方上有一个简单的模板

```
<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>com.mycompany.app</groupId>
  <artifactId>my-app</artifactId>
  <version>1.0-SNAPSHOT</version>

  <properties>
    <maven.compiler.source>1.7</maven.compiler.source>
    <maven.compiler.target>1.7</maven.compiler.target>
  </properties>

  <dependencies>
    <dependency>
      <groupId>junit</groupId>  //包名
      <artifactId>junit</artifactId>    //项目名
      <version>4.12</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
</project>
```

maven 仓库

maven会在本地`C:\Users\cwl\.m2` 用户目录下创建一个本地仓库，存一些jar包

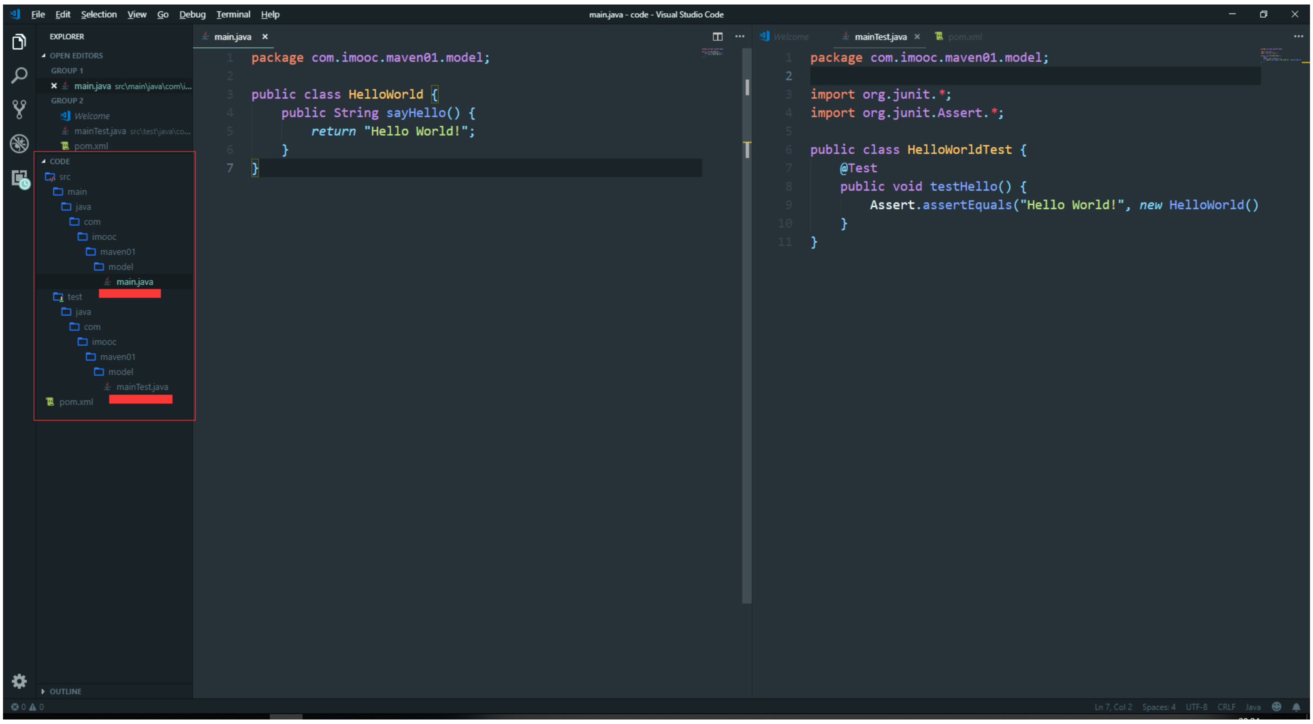
可以在在`$MAVEN_HOME/conf/setting.xml`里面修改,我们可以在里面找到如下说明

另外还有第三方仓库，中央仓库等概念，这里先不提。

```
  <!-- localRepository
   | The path to the local repository maven will use to store artifacts.
   |
   | Default: ${user.home}/.m2/repository
  <localRepository>/path/to/local/repo</localRepository>
  -->
```

下面是一个 maven 运行一个基础程序的例子

首先建立如下目录的文件夹



```java
package com.imooc.maven01.model;

public class HelloWorld {
    public String sayHello() {
        return "Hello World!";
    }
}
```

```java
package com.imooc.maven01.model;

import org.junit.*;
import org.junit.Assert.*;

public class HelloWorldTest {
    @Test
    public void testHello() {
        Assert.assertEquals("Hello World!", new HelloWorld()
    }
}
```

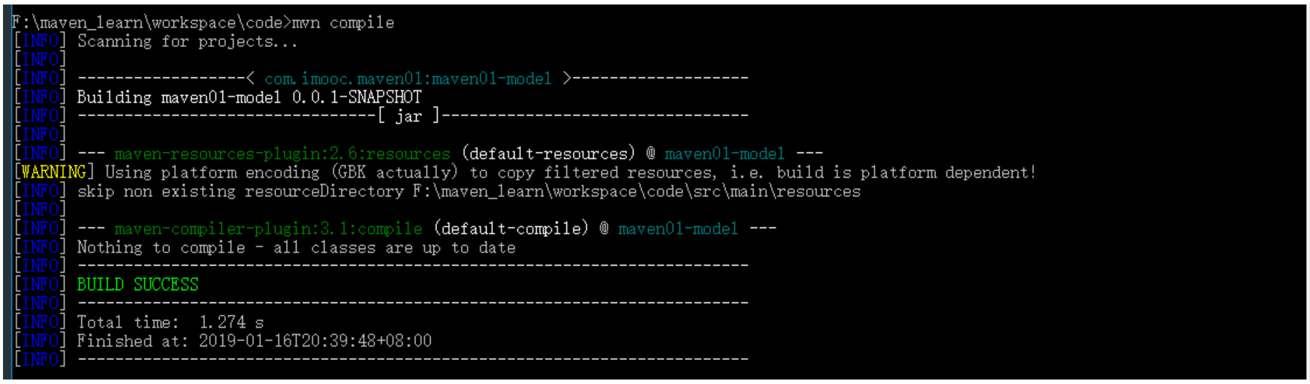
```
// pom.xml
<project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.imooc.maven01</groupId>
  <artifactId>maven01-model</artifactId>
  <version>0.0.1-SNAPSHOT</version>

  <dependencies>
    <dependency>
        <groupId>junit</groupId>
        <artifactId>junit</artifactId>
        <version>4.12</version>
    </dependency>
  </dependencies>
</project>
```

文件夹结构要与包结构一致, 注意pom.xml和src目录同级

pom.xml与src在同一目录下，然后在src, pom.xml 目录下打开cmd

输入 `mvn compile` 执行编译命令

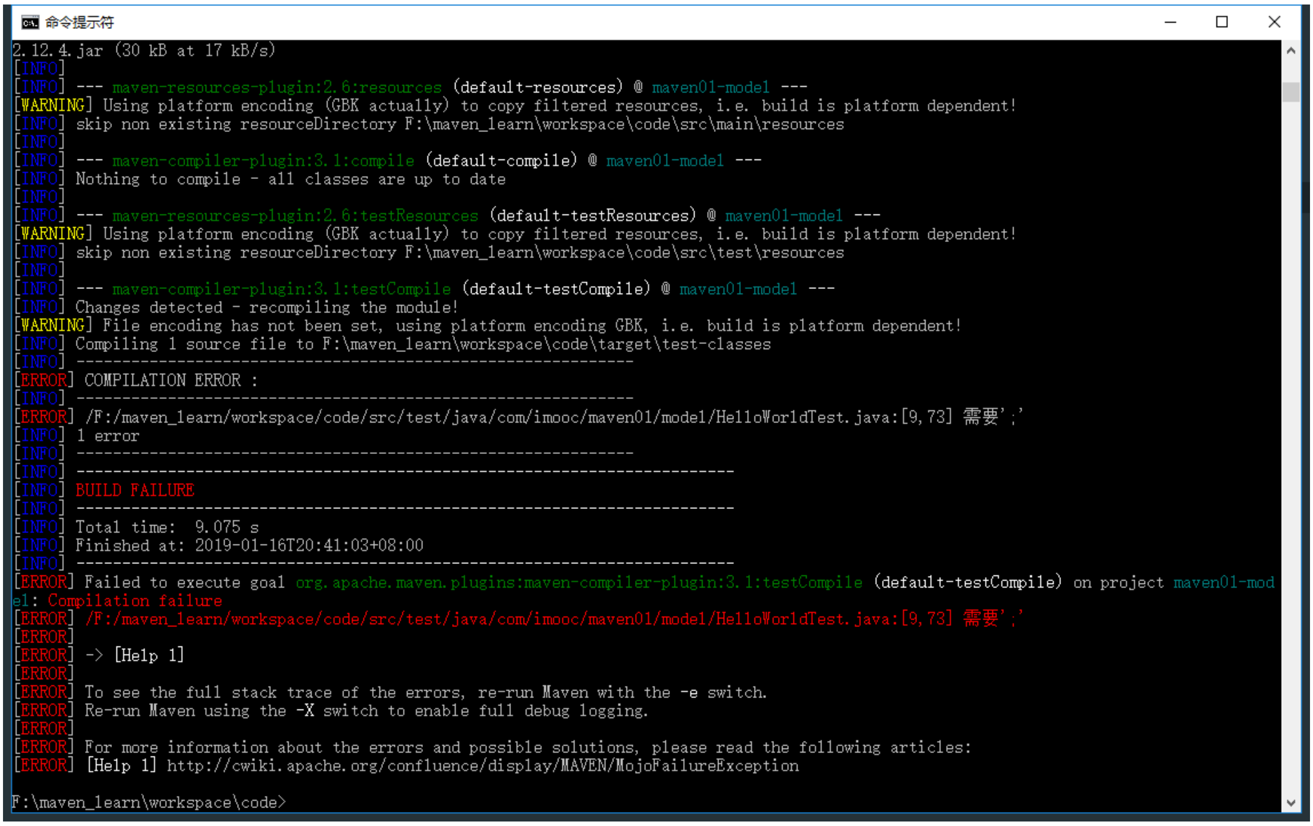
第一次会下载很多依赖的包, 要等一等



```
F:\maven_learn\workspace\code>mvn compile
[INFO] Scanning for projects...
[INFO]
[INFO] ------------------< com.imooc.maven01:maven01-model >-------------------
[INFO] Building maven01-model 0.0.1-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ maven01-model ---
[WARNING] Using platform encoding (GBK actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory F:\maven_learn\workspace\code\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ maven01-model ---
[INFO] Nothing to compile - all classes are up to date
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  1.274 s
[INFO] Finished at: 2019-01-16T20:39:48+08:00
[INFO] ------------------------------------------------------------------------
```

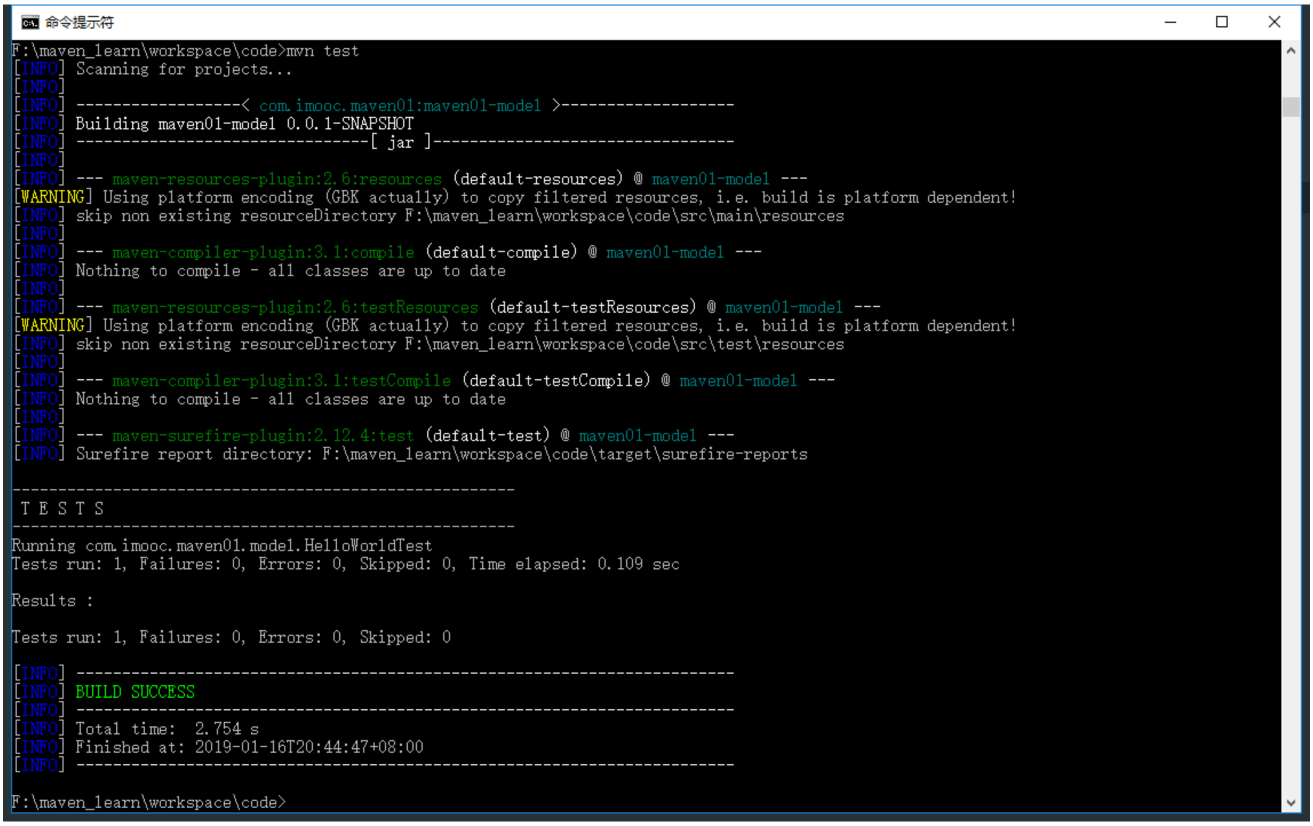
输入 `mvn test` 会执行测试用例

发现编译的错误会在test的时候输出，少了分号



```
2.12.4.jar (30 kB at 17 kB/s)
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ maven01-model ---
[WARNING] Using platform encoding (GBK actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory F:\maven_learn\workspace\code\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ maven01-model ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ maven01-model ---
[WARNING] Using platform encoding (GBK actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory F:\maven_learn\workspace\code\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ maven01-model ---
[INFO] Changes detected - recompiling the module!
[WARNING] File encoding has not been set, using platform encoding GBK, i.e. build is platform dependent!
[INFO] Compiling 1 source file to F:\maven_learn\workspace\code\target\test-classes
[INFO] -------------------------------------------------------------
[ERROR] COMPILATION ERROR :
[INFO] -------------------------------------------------------------
[ERROR] /F:/maven_learn/workspace/code/src/test/java/com/imooc/maven01/model/HelloWorldTest.java:[9,73] 需要';'
[INFO] 1 error
[INFO] -------------------------------------------------------------
[INFO] ------------------------------------------------------------------------
[INFO] BUILD FAILURE
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  9.075 s
[INFO] Finished at: 2019-01-16T20:41:03+08:00
[INFO] ------------------------------------------------------------------------
[ERROR] Failed to execute goal org.apache.maven.plugins:maven-compiler-plugin:3.1:testCompile (default-testCompile) on project maven01-mod
el: Compilation failure
[ERROR] /F:/maven_learn/workspace/code/src/test/java/com/imooc/maven01/model/HelloWorldTest.java:[9,73] 需要';'
[ERROR]
[ERROR] -> [Help 1]
[ERROR]
[ERROR] To see the full stack trace of the errors, re-run Maven with the -e switch.
[ERROR] Re-run Maven using the -X switch to enable full debug logging.
[ERROR]
[ERROR] For more information about the errors and possible solutions, please read the following articles:
[ERROR] [Help 1] http://cwiki.apache.org/confluence/display/MAVEN/MojoFailureException

F:\maven_learn\workspace\code>
```

修改测试成功后



```
F:\maven_learn\workspace\code>mvn test
[INFO] Scanning for projects...
[INFO]
[INFO] ------------------< com.imooc.maven01:maven01-model >-------------------
[INFO] Building maven01-model 0.0.1-SNAPSHOT
[INFO] --------------------------------[ jar ]---------------------------------
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ maven01-model ---
[WARNING] Using platform encoding (GBK actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory F:\maven_learn\workspace\code\src\main\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:compile (default-compile) @ maven01-model ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ maven01-model ---
[WARNING] Using platform encoding (GBK actually) to copy filtered resources, i.e. build is platform dependent!
[INFO] skip non existing resourceDirectory F:\maven_learn\workspace\code\src\test\resources
[INFO]
[INFO] --- maven-compiler-plugin:3.1:testCompile (default-testCompile) @ maven01-model ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-surefire-plugin:2.12.4:test (default-test) @ maven01-model ---
[INFO] Surefire report directory: F:\maven_learn\workspace\code\target\surefire-reports

-------------------------------------------------------
 T E S T S
-------------------------------------------------------
Running com.imooc.maven01.model.HelloWorldTest
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.109 sec

Results :

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

[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
[INFO] Total time:  2.754 s
[INFO] Finished at: 2019-01-16T20:44:47+08:00
[INFO] ------------------------------------------------------------------------

F:\maven_learn\workspace\code>
```

输入 `mvn package` 会打包一个jar包

和src目录同级别的jar包