

Ex. No: 5	Java JAR Creation Clean Lifecycle
28.08.2024	

Aim:

To create a Java project, package it with dependencies, compile and build a JAR file using Maven, and explore the Maven lifecycle and plugins

Procedure:

1. Create a New Maven Java Project

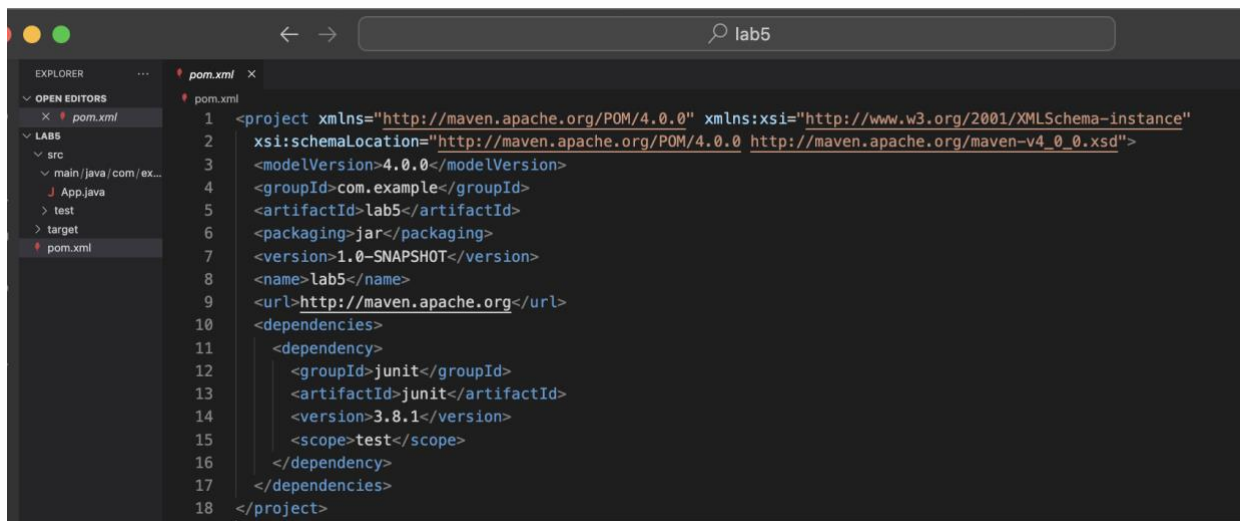
```
(base) ishareddyvaka@Ishas-MacBook-Air lab5 % mvn archetype:generate -DgroupId=com.example -DartifactId=lab5 -DarchetypeArtifactId=maven-archetype-quickstart -DinteractiveMode=false
[INFO] Unable to find the root directory. Create a .mvn directory in the root directory or add the root="true" attribute on the root project's model to identify it.
[INFO] Scanning for projects...
[INFO]
[INFO] -----< org.apache.maven:standalone-pom >-----
[INFO] Building Maven Stub Project (No POM) 1
[INFO] -----[ pom ]-----
[INFO]
[INFO] --- archetype:3.2.1:generate (default-cli) @ standalone-pom ---
[INFO] Generating project in Batch mode
[INFO]
[INFO] Using following parameters for creating project from Old (1.x) Archetype: maven-archetype-quickstart:1.0
[INFO]
[INFO] Parameter: basedir, Value: /Users/ishareddyvaka/Documents/devops-lab/lab5
[INFO] Parameter: package, Value: com.example
[INFO] Parameter: groupId, Value: com.example
[INFO] Parameter: artifactId, Value: lab5
[INFO] Parameter: packageName, Value: com.example
[INFO] Parameter: version, Value: 1.0-SNAPSHOT
[INFO] project created from Old (1.x) Archetype in dir: /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] -----
[INFO] Total time:  8.852 s
[INFO] Finished at: 2024-09-01T15:26:06+05:30
[INFO] -----
(base) ishareddyvaka@Ishas-MacBook-Air lab5 %
```

- **groupId**: The unique identifier for the project (package name).
- **artifactId**: The name of the project.
- **archetypeArtifactId**: The template being used.

The screenshot shows an IDE window with a search bar at the top containing 'lab5'. The Explorer panel on the left shows the project structure: 'src' > 'main' > 'java' > 'com' > 'example' > 'App.java'. The main editor displays the following code:

```
1 package com.example;
2
3 /**
4  * Hello world!
5  *
6  */
7 public class App
8 {
9     Run | Debug
10    public static void main( String[] args )
11    {
12        System.out.println( x:"Hello World!" );
13    }
14 }
```

2. Add Dependencies to pom.xml



```
1 <project xmlns="http://maven.apache.org/POM/4.0.0" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
2   xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/maven-v4_0_0.xsd">
3   <modelVersion>4.0.0</modelVersion>
4   <groupId>com.example</groupId>
5   <artifactId>lab5</artifactId>
6   <packaging>jar</packaging>
7   <version>1.0-SNAPSHOT</version>
8   <name>lab5</name>
9   <url>http://maven.apache.org</url>
10  <dependencies>
11    <dependency>
12      <groupId>junit</groupId>
13      <artifactId>junit</artifactId>
14      <version>3.8.1</version>
15      <scope>test</scope>
16    </dependency>
17  </dependencies>
18 </project>
```

3. Compile and build the JAR File

```
(base) ishareddyvaka@Ishas-MacBook-Air lab5 % mvn compile
[INFO] Unable to find the root directory. Create a .mvn directory in the root directory or add the root="true" attribute on the root project's model to identify it.
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.example:lab5 >-----
[INFO] Building lab5 1.0-SNAPSHOT
[INFO] from pom.xml
[INFO] -----[ jar ]-----
[WARNING] Version not locked for default bindings plugins [maven-resources-plugin, maven-compiler-plugin], you should define versions in pluginManagement section of your pom.xml or parent
[INFO]
[INFO] --- resources:3.3.1:resources (default-resources) @ lab5 ---
[INFO] skip non existing resourceDirectory /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/src/main/resources
[INFO] skip non existing resourceDirectory /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/src/main/resources-filtered
[INFO]
[INFO] --- compiler:3.13.0:compile (default-compile) @ lab5 ---
[INFO] Recompiling the module because of added or removed source files.
[INFO] Compiling 1 source file with javac [debug target 1.8] to target/classes
[WARNING] bootstrap class path not set in conjunction with -source 8
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 0.850 s
[INFO] Finished at: 2024-09-01T15:29:15+05:30
[INFO]
[base] ishareddyvaka@Ishas-MacBook-Air lab5 % mvn package
[INFO] Unable to find the root directory. Create a .mvn directory in the root directory or add the root="true" attribute on the root project's model to identify it.
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.example:lab5 >-----
[INFO] Building lab5 1.0-SNAPSHOT
[INFO] from pom.xml
[INFO] -----[ jar ]-----
[WARNING] Version not locked for default bindings plugins [maven-resources-plugin, maven-compiler-plugin, maven-surefire-plugin, maven-jar-plugin], you should define versions in pluginManagement section of your pom.xml or parent
[INFO]
[INFO] --- resources:3.3.1:resources (default-resources) @ lab5 ---
[INFO] skip non existing resourceDirectory /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/src/main/resources
[INFO] skip non existing resourceDirectory /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/src/main/resources-filtered
[INFO]
[INFO] --- compiler:3.13.0:compile (default-compile) @ lab5 ---
[INFO] Nothing to compile - all classes are up to date.
[INFO]
[INFO] --- resources:3.3.1:testResources (default-testResources) @ lab5 ---
[INFO] skip non existing resourceDirectory /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/src/test/resources
[INFO] skip non existing resourceDirectory /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/src/test/resources-filtered
[INFO]
[INFO] --- compiler:3.13.0:testCompile (default-testCompile) @ lab5 ---
[INFO] Recompiling the module because of added or removed source files.
[INFO] Compiling 1 source file with javac [debug target 1.8] to target/test-classes
[WARNING] bootstrap class path not set in conjunction with -source 8
[INFO]
[INFO] --- surefire:3.2.5:test (default-test) @ lab5 ---
[INFO] Using auto detected provider org.apache.maven.surefire.junit3.JUnit3Provider
[INFO]
[INFO] T E S T S
[INFO]
[INFO] Running com.example.AppTest
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.012 s -- in com.example.AppTest
[INFO]
[INFO] Results:
[INFO]
[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0
[INFO]
[INFO]
[INFO] --- jar:3.4.1:jar (default-jar) @ lab5 ---
[INFO] Building jar: /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/target/lab5-1.0-SNAPSHOT.jar
[INFO] Copying com.example:lab5:pom:1.0-SNAPSHOT to project local repository
[INFO] Copying com.example:lab5:jar:1.0-SNAPSHOT to project local repository
[INFO] Copying com.example:lab5:pom:consumer:1.0-SNAPSHOT to project local repository
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] Total time: 2.022 s
[INFO] Finished at: 2024-09-01T15:29:28+05:30
[INFO]
```

4. Compile and build the JAR File Execute the Clean Lifecycle

```
(base) ishareddyvaka@Ishas-MacBook-Air lab5 % mvn clean
[INFO] Unable to find the root directory. Create a .mvn directory in the root directory or add the root="true" attribute on the root project's model to identify it.
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.example:lab5 >-----
[INFO] Building lab5 1.0-SNAPSHOT
[INFO] from pom.xml
[INFO]
[INFO] -----[ jar ]-----
[INFO]
[INFO] --- clean:3.2.0:clean (default-clean) @ lab5 ---
[INFO] Deleting /Users/ishareddyvaka/Documents/devops-lab/lab5/lab5/target
[INFO]
[INFO] BUILD SUCCESS
[INFO]
[INFO] -----
[INFO] Total time: 0.526 s
[INFO] Finished at: 2024-09-01T15:29:44+05:30
[INFO]
[INFO] -----
```

5. Explore Plugins and Goals Associated with Clean

```
(base) ishareddyvaka@Ishas-MacBook-Air lab5 % mvn help:describe -Dcmd=clean
[INFO] Unable to find the root directory. Create a .mvn directory in the root directory or add the root="true" attribute on the root project's model to identify it.
[INFO] Scanning for projects...
[INFO]
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-help-plugin/maven-metadata.xml
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-help-plugin/maven-metadata.xml (776 B at 2.0 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-help-plugin/3.5.0/maven-help-plugin-3.5.0.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-help-plugin/3.5.0/maven-help-plugin-3.5.0.pom (10 kB at 290 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/43/maven-plugins-43.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/43/maven-plugins-43.pom (7.5 kB at 257 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/43/maven-parent-43.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/maven-parent/43/maven-parent-43.pom (50 kB at 155 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/apache/33/apache-33.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/apache/33/apache-33.pom (24 kB at 30 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/junit/junit-bom/5.10.3/junit-bom-5.10.3.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/junit/junit-bom/5.10.3/junit-bom-5.10.3.pom (5.6 kB at 297 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-help-plugin/3.5.0/maven-help-plugin-3.5.0.jar
Downloaded from central: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-help-plugin/3.5.0/maven-help-plugin-3.5.0.jar (65 kB at 1.1 MB/s)
[INFO]
[INFO] -----< com.example:lab5 >-----
[INFO] Building lab5 1.0-SNAPSHOT
[INFO] from pom.xml
[INFO]
[INFO] -----[ jar ]-----
[INFO]
[INFO] --- help:3.5.0:describe (default-cli) @ lab5 ---
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-interactivity-api/1.3/plexus-interactivity-api-1.3.pom
Downloaded from central: https://repo.maven.apache.org/maven2/org/codehaus/plexus/plexus-interactivity-api/1.3/plexus-interactivity-api-1.3.pom (320 B at 333 kB/s)
[INFO] Downloading from central: https://repo.maven.apache.org/maven2/com/thoughtworks/xstream/xstream/1.4.20/xstream-1.4.20.jar
Downloaded from central: https://repo.maven.apache.org/maven2/com/thoughtworks/xstream/xstream/1.4.20/xstream-1.4.20.jar (645 kB at 550 kB/s)
[INFO] 'clean' is a phase within the 'clean' lifecycle, which has the following phases:
* pre-clean: Not defined
* clean: org.apache.maven.plugins:maven-clean-plugin:3.2.0:clean
* post-clean: Not defined
[INFO]
[INFO] -----
[INFO] BUILD SUCCESS
[INFO]
[INFO] -----
[INFO] Total time: 4.209 s
[INFO] Finished at: 2024-09-01T15:30:11+05:30
[INFO]
[INFO] -----
(base) ishareddyvaka@Ishas-MacBook-Air lab5 %
```

This command will list all the goals bound to the clean phase by default. The clean:clean goal is executed during the clean phase, which deletes the ‘target’ directory

Result:

Therefore, we've successfully a Java project set up with Maven, packaged into a JAR, and you've explored the clean lifecycle and associated plugins.