**Working with Maven Project**

In this lab we are going to create a Hello World project using Maven and work with Maven Plugins

**Creating a Project (https://maven.apache.org/guides/getting-started/maven-in-five-minutes.html\_**

Create a directory for the project by running the below maven templates.

[root@ip-172-31-34-219] # mvn archetype:generate -DgroupId=com.mycompany.app -DartifactId=my-app - archetypeArtifactId=maven-archetype-quickstart -DarchetypeVersion=1.4 -DinteractiveMode=false

mvn archetype:generate -DgroupId=com.mycompany.app -DartifactId=my-app -DarchetypeArtifactId=maven-archetype-quickstart -DarchetypeVersion=1.4 -DinteractiveMode=false

**Check if the project folder has got created and observe the project structure**

[root@ip-172-31-34-219 ~]# ls

my-app

[root@ip-172-31-34-219 ~]# yum install tree

[root@ip-172-31-34-219 my-app]# tree

.

├── pom.xml

├── src

│   ├── main

│   │   └── java

│   │   └── com

│   │   └── mycompany

│   │   └── app

│   │   └── App.java

│   └── test

│   └── java

│   └── com

│   └── mycompany

│   └── app

│   └── AppTest.java

└── target

├── classes

│   └── com

│   └── mycompany

│   └── app

│   └── App.class

├── generated-sources

│   └── annotations

└── maven-status

└── maven-compiler-plugin

└── compile

└── default-compile

├── createdFiles.lst

└── inputFiles.lst

my-app

|-- pom.xml

`-- src

|-- main

| `-- java

| `-- com

| `-- mycompany

| `-- app

| `-- App.java

`-- test

`-- java

`-- com

`-- mycompany

`-- app

`-- AppTest.java

The src/main/java directory contains the project source code, the  src./test/java directory contains the test source, and the  pom.xml file is the project's Project Object Model, or POM.

**The POM**

pom.xml file is the core of a project's configuration in Maven. It is a single configuration file that contains the majority of information required to build a project in just the way you want. The POM is huge and can be daunting in its complexity, but it is not necessary to understand all of the intricacies just yet to use it effectively. This project's POM is:

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/xsd/maven-4.0.0.xsd">
3. <modelVersion>4.0.0</modelVersion>
5. <groupId>com.mycompany.app</groupId>
6. <artifactId>my-app</artifactId>
7. <version>1.0-SNAPSHOT</version>
9. <properties>
10. <maven.compiler.source>1.7</maven.compiler.source>
11. <maven.compiler.target>1.7</maven.compiler.target>
12. </properties>
14. <dependencies>
15. <dependency>
16. <groupId>junit</groupId>
17. <artifactId>junit</artifactId>
18. <version>4.12</version>
19. <scope>test</scope>
20. </dependency>
21. </dependencies>
22. </project>

**Maven Phases**

Below are the lifecycle phases which we are going to execute.

* **compile**: compile the source code of the project
* **test**: test the compiled source code using a suitable unit testing framework. These tests should not require the code be packaged or deployed
* **validate**: validate the project is correct and all necessary information is available
* **package**: take the compiled code and package it in its distributable format, such as a JAR.
* **verify**: run any checks to verify the package is valid and meets quality criteria
* **clean**: cleans up artifacts created by prior builds
* **site**: generates site documentation for this project

**Compile the project**

[root@ip-172-31-34-219 my-app]# mvn compile

[INFO] Scanning for projects...

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] Building my-app 1.0-SNAPSHOT

[INFO] ------------------------------------------------------------------------

Downloading: <https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-resources-plugin/3.0.2/maven-resources-plugin-3.0.2.pom>

Downloaded: https://repo.maven.apache.org/maven2/com/thoughtworks/qdox/qdox/2.0-M9/qdox-2.0-M9.jar (310 KB at 3404.8 KB/sec)

[INFO] Changes detected - recompiling the module!

[INFO] Compiling 1 source file to /root/my-app/target/classes

[INFO] ------------------------------------------------------------------------

[INFO] BUILD SUCCESS

[INFO] ------------------------------------------------------------------------

[INFO] Total time: 5.799s

[INFO] Finished at: Sun Mar 20 12:18:35 UTC 2022

[INFO] Final Memory: 13M/33M

[INFO] ------------------------------------------------------------------------

**Test the project**

[root@ip-172-31-34-219 my-app]# mvn test

[INFO] Scanning for projects...

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] Building my-app 1.0-SNAPSHOT

[INFO] ------------------------------------------------------------------------

Downloading: <https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-surefire-plugin/2.22.1/maven-surefire-plugin-2.22.1.pom>

[INFO]

[INFO] -------------------------------------------------------

[INFO] T E S T S

[INFO] -------------------------------------------------------

[INFO] Running com.mycompany.app.AppTest

[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.1 s - in com.mycompany.app.AppTest

[INFO]

[INFO] Results:

[INFO]

[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] BUILD SUCCESS

[INFO] ------------------------------------------------------------------------

[INFO] Total time: 6.477s

[INFO] Finished at: Sun Mar 20 12:26:29 UTC 2022

[INFO] Final Memory: 15M/36M

[INFO] ------------------------------------------------------------------------

**Validate the project:**

[root@ip-172-31-34-219 my-app]# mvn validate

[INFO] Scanning for projects...

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] Building my-app 1.0-SNAPSHOT

[INFO] ------------------------------------------------------------------------

[INFO] ------------------------------------------------------------------------

[INFO] BUILD SUCCESS

[INFO] ------------------------------------------------------------------------

[INFO] Total time: 0.228s

[INFO] Finished at: Sun Mar 20 12:27:07 UTC 2022

[INFO] Final Memory: 5M/15M

[INFO] ------------------------------------------------------------------------

**Build the Project**

[root@ip-172-31-34-219 my-app]# mvn package

[INFO] Scanning for projects...

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] Building my-app 1.0-SNAPSHOT

[INFO] ------------------------------------------------------------------------

Downloading: <https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-jar-plugin/3.0.2/maven-jar-plugin-3.0.2.pom>

...

[INFO] ------------------------------------------------------------------------

[INFO] BUILD SUCCESS

[INFO] ------------------------------------------------------------------------

[INFO] Total time: 2.953 s

[INFO] Finished at: 2019-11-24T13:05:10+01:00

[INFO] ------------------------------------------------------------------------

**Check if the target folder has been created and check the contents**

[root@ip-172-31-34-219 my-app]# ls

pom.xml src target

[root@ip-172-31-34-219 my-app]# cd target

[root@ip-172-31-34-219 target]# ls

**Test the newly compiled and packaged JAR with the following command:**

java -cp target/my-app-1.0-SNAPSHOT.jar com.mycompany.app.App

**Check the o/p:**

Hello World!

**Verify the project:**

[root@ip-172-31-34-219 my-app]# mvn verify

[INFO] Scanning for projects...

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] Building my-app 1.0-SNAPSHOT

[INFO] ------------------------------------------------------------------------

[INFO]

[INFO] --- maven-resources-plugin:3.0.2:resources (default-resources) @ my-app ---

[INFO] Using 'UTF-8' encoding to copy filtered resources.

[INFO] skip non existing resourceDirectory /root/my-app/src/main/resources

[INFO]

[INFO] --- maven-compiler-plugin:3.8.0:compile (default-compile) @ my-app ---

[INFO] Nothing to compile - all classes are up to date

[INFO]

[INFO] --- maven-resources-plugin:3.0.2:testResources (default-testResources) @ my-app ---

[INFO] Using 'UTF-8' encoding to copy filtered resources.

[INFO] skip non existing resourceDirectory /root/my-app/src/test/resources

[INFO]

[INFO] --- maven-compiler-plugin:3.8.0:testCompile (default-testCompile) @ my-app ---

[INFO] Nothing to compile - all classes are up to date

[INFO]

[INFO] --- maven-surefire-plugin:2.22.1:test (default-test) @ my-app ---

[INFO]

[INFO] -------------------------------------------------------

[INFO] T E S T S

[INFO] -------------------------------------------------------

[INFO] Running com.mycompany.app.AppTest

[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 0.081 s - in com.mycompany.app.AppTest

[INFO]

[INFO] Results:

[INFO]

[INFO] Tests run: 1, Failures: 0, Errors: 0, Skipped: 0

[INFO]

[INFO]

[INFO] --- maven-jar-plugin:3.0.2:jar (default-jar) @ my-app ---

[INFO] ------------------------------------------------------------------------

[INFO] BUILD SUCCESS

[INFO] ------------------------------------------------------------------------

[INFO] Total time: 3.349s

[INFO] Finished at: Sun Mar 20 12:30:40 UTC 2022

[INFO] Final Memory: 10M/24M

[INFO] ------------------------------------------------------------------------

**Generating the Site**

[root@ip-172-31-34-219 my-app]# mvn site

[INFO] Scanning for projects...

Mar 20, 2022 12:34:00 PM org.sonatype.guice.bean.reflect.Logs$JULSink warn

WARNING: Error injecting: org.apache.maven.lifecycle.mapping.DefaultLifecycleMapping$\_\_plexus4

[root@ip-172-31-34-219 my-app]# ls

pom.xml src target

[root@ip-172-31-34-219 my-app]# cd target

[root@ip-172-31-34-219 target]# ls

classes generated-test-sources maven-status site test-classes

generated-sources maven-archiver my-app-1.0-SNAPSHOT.jar surefire-reports

**Clean the build:**

[root@ip-172-31-34-219 my-app]# mvn clean

[INFO] Scanning for projects...

[INFO]

[INFO] ------------------------------------------------------------------------

[INFO] Building my-app 1.0-SNAPSHOT

[INFO] ------------------------------------------------------------------------

Downloading: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.1.0/maven-clean-plugin-3.1.0.pom

Downloaded: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.1.0/maven-clean-plugin-3.1.0.pom (6 KB at 11.0 KB/sec)

Downloading: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/31/maven-plugins-31.pom

Downloaded: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-plugins/31/maven-plugins-31.pom (11 KB at 298.7 KB/sec)

Downloading: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.1.0/maven-clean-plugin-3.1.0.jar

Downloaded: https://repo.maven.apache.org/maven2/org/apache/maven/plugins/maven-clean-plugin/3.1.0/maven-clean-plugin-3.1.0.jar (30 KB at 692.2 KB/sec)

[INFO]

[INFO] --- maven-clean-plugin:3.1.0:clean (default-clean) @ my-app ---

[INFO] Deleting /root/my-app/target

[INFO] ------------------------------------------------------------------------

[INFO] BUILD SUCCESS

[INFO] ------------------------------------------------------------------------

[INFO] Total time: 1.691s

[INFO] Finished at: Sun Mar 20 12:32:50 UTC 2022

[INFO] Final Memory: 8M/21M

[INFO] ------------------------------------------------------------------------