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Day 24:.

Task 1: Build Lifecycle

Demonstrate the use of Maven lifecycle phases (clean, compile, test, package, install, deploy) by executing them on a sample project and documenting what happens in each phase.

Phase 1: clean

This phase ensures that the project is in a clean state before building it.

mvn clean

What happens:

Deletes the target directory (where build artifacts are stored).

Cleans up any files created during the previous build.

Phase 2: compile

This phase compiles the source code of the project.

mvn compile

What happens:

Compiles all Java source files (src/main/java) in the project.

Outputs compiled classes to target/classes.

Phase 3: test

This phase runs tests against compiled source code using a suitable unit testing framework.

mvn test

What happens:

- Executes all test cases found in src/test/java.
- Reports on test results.
- By default, this uses JUnit and creates a report in target/surefire-reports.

Phase 4: package

This phase packages the compiled code into distributable format, such as JAR, WAR, or EAR.

mvn package

What happens:

- Takes the compiled code (target/classes), resources (src/main/resources), and tests (target/test-classes) and packages them into a JAR (by default).
- Outputs the packaged artifact (maven-demo-1.0-SNAPSHOT.jar) in the target directory.

Phase 5: install

This phase installs the package into the local repository, for use as a dependency in other projects locally.

mvn install

What happens:

- Copies the packaged artifact (maven-demo-1.0-SNAPSHOT.jar) into the local Maven repository (~/.m2/repository/com/example/mavenproject/maven-demo/1.0-SNAPSHOT/).
- Makes it available for other projects that declare it as a dependency in their pom.xml files.

Phase 6: deploy

This phase copies the final package to the remote repository for sharing with other developers and projects.

mvn deploy

What happens:

- Copies the packaged artifact to a remote repository (if configured) like Nexus or Artifactory.
- Typically used in a Continuous Integration/Continuous Deployment (CI/CD) environment to share artifacts across multiple projects.

Output:

1. clean Phase

[INFO] Scanning for projects...

[INFO]

[INFO] --------------< com.example:sample-maven-project >--------------

[INFO] Building sample-maven-project 1.0-SNAPSHOT

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

[INFO]

[INFO] --- maven-clean-plugin:3.1.0:clean (default-clean) @ sample-maven-project ---

[INFO] Deleting /path/to/sample-maven-project/target

[INFO] --

[INFO] BUILD SUCCESS

[INFO] --

[INFO] Total time: 0.391 s

[INFO] Finished at: 2024-06-19T12:00:00Z

[INFO] --

2. compile Phase

[INFO] Scanning for projects...

[INFO]

[INFO] --------------< com.example:sample-maven-project >--------------

[INFO] Building sample-maven-project 1.0-SNAPSHOT

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:resources (default-resources) @ sample-maven-project ---

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

[INFO] Copying 0 resource

[INFO] Copying 0 resource

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ sample-maven-project ---

[INFO] Changes detected - recompiling the module!

[INFO] Compiling 1 source file to /path/to/sample-maven-project/target/classes

[INFO] --

[INFO] BUILD SUCCESS

[INFO] --

[INFO] Total time: 1.116 s

[INFO] Finished at: 2024-06-19T12:00:00Z

[INFO] --

3. test Phase: output:

[INFO] Scanning for projects...

[INFO]

[INFO] --------------< com.example:sample-maven-project >--------------

[INFO] Building sample-maven-project 1.0-SNAPSHOT

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:resources (default-resources) @ sample-maven-project ---

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

[INFO] Copying 0 resource

[INFO] Copying 0 resource

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ sample-maven-project ---

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:testResources (default-testResources) @ sample-maven-project ---

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

[INFO] skip non existing resourceDirectory /path/to/sample-maven-project/src/test/resources

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ sample-maven-project ---

[INFO] No sources to compile

[INFO]

[INFO] --- maven-surefire-plugin:3.0.0-M5:test (default-test) @ sample-maven-project ---

[INFO] No tests to run.

[INFO] --

[INFO] BUILD SUCCESS

[INFO] --

[INFO] Total time: 1.265 s

[INFO] Finished at: 2024-06-19T12:00:00Z

[INFO] --

4. package Phase:

Output:

[INFO] Scanning for projects...

[INFO]

[INFO] --------------< com.example:sample-maven-project >--------------

[INFO] Building sample-maven-project 1.0-SNAPSHOT

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:resources (default-resources) @ sample-maven-project ---

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

[INFO] Copying 0 resource

[INFO] Copying 0 resource

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ sample-maven-project ---

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:testResources (default-testResources) @ sample-maven-project ---

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

[INFO] skip non existing resourceDirectory /path/to/sample-maven-project/src/test/resources

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ sample-maven-project ---

[INFO] No sources to compile

[INFO]

[INFO] --- maven-surefire-plugin:3.0.0-M5:test (default-test) @ sample-maven-project ---

[INFO] No tests to run.

[INFO]

[INFO] --- maven-jar-plugin:3.2.0:jar (default-jar) @ sample-maven-project ---

[INFO] Building jar: /path/to/sample-maven-project/target/sample-maven-project-1.0-SNAPSHOT.jar

[INFO] --

[INFO] BUILD SUCCESS

[INFO] --

[INFO] Total time: 1.232 s

[INFO] Finished at: 2024-06-19T12:00:00Z

[INFO] --

5. install Phase: output:

[INFO] Scanning for projects...

[INFO]

[INFO] --------------< com.example:sample-maven-project >--------------

[INFO] Building sample-maven-project 1.0-SNAPSHOT

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:resources (default-resources) @ sample-maven-project ---

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

[INFO] Copying 0 resource

[INFO] Copying 0 resource

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:compile (default-compile) @ sample-maven-project ---

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

[INFO]

[INFO] --- maven-resources-plugin:3.2.0:testResources (default-testResources) @ sample-maven-project ---

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

[INFO] skip non existing resourceDirectory /path/to/sample-maven-project/src/test/resources

[INFO]

[INFO] --- maven-compiler-plugin:3.8.1:testCompile (default-testCompile) @ sample-maven-project ---

[INFO] No sources to compile

[INFO]

[INFO] --- maven-surefire-plugin:3.0.0-M5:test (default-test) @ sample-maven-project ---

[INFO] No tests to run.

[INFO]

[INFO] --- maven-jar-plugin:3.2.0:jar (default-jar) @ sample-maven-project ---

[INFO] Building jar: /path/to/sample-maven-project/target/sample-maven-project-1.0-SNAPSHOT.jar

[INFO]

[INFO] --- maven-install-plugin:3.0.0-M1:install (default-install