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Lifecycle and Installation of Plugins in Maven

AIM :

To study the lifecycle and installation of various plugins in Maven.

INTRODUCTION :

Maven is a build automation and project management tool primarily used for Java projects. It provides a standard way to build and manage projects.

LIFECYCLE :

- **Default:** The main lifecycle, which handles project deployment. It includes the following phases:
- **Validate:** Validates that the project is correct and all necessary information is available.
- **Compile:** Compiles the source code.
- **Test:** Runs the unit tests using a suitable testing framework.
- **Package:** Packages the compiled code into a JAR or WAR file.
- **Integration:** Integrates tests.
- **Verify:** Verifies the results.
- **Install:** Installs the packages.
- **Deploy:** Copies the final package to the developers.
- **Clean:** Handles project cleaning.
- **Clean:** Removes generated files.
- **Pre-site:** Prepares before site generation.
- **Site:** Generates the project site.
- **Post-site:** Executes after the site is generated. It involves site documentation.
- **Site-deploy:** Deploys the generated site to the web server.

MAVEN PLUGINS :

Maven plugins are the core of Maven's build system as they allow Maven to perform specific tasks, such as compiling code, running tests, and packaging.

Common Plugins in Maven:

- **Maven-compiler-plugin:**
  - It is used to compile the Java source code.
- **Maven-surefire-plugin:**
  - Used to run unit tests during the test phase.
- **Maven-jar-plugin:**
  - Used to create a JAR file for the project.
- **Maven-war-plugin:**
  - Used to deploy the project to a remote repository.
- **Maven Deploy Plugin:**
  - Used to deploy the project to a remote repository.

PLUGIN GOALS AND EXECUTION :

- Plugins contain a set of goals.
- Goals are individual tasks executed during phases of the build lifecycle.

Execution - mvn <plugin> <goal>

Example : mvn compiler:compile

INSTALLING AND CONFIGURING PLUGINS IN MAVEN :

Default Plugins:

- Maven automatically uses certain plugins based on the lifecycle phases.

Configuring Plugins in POM XML:

- This allows specifying plugin configuration options and binding custom goals to lifecycle phases.

Exmaple : Pom.xml

```
<build>
  <plugins>
    <plugin>
      <groupId>org.apache.maven.plugins</groupId>
      <artifactId>maven-compiler-plugin</artifactId>
     <version>3.8.1</version>
  <configuration>
          <source>1.8</source>
           <target>1.8</target>
  </configuration>
      </plugin>
    </plugins>
 </build>
```

Installing Plugins

INSTALLING PLUGINS :

Maven automatically downloads and installs plugins from its central repository or other specified repositories.

Example command to install a plugin manually:

```
mvn install:install-file -Dfile=path-to-plugin
-DgroupId=com.example
-DartifactId=my-plugin
-Dversion=1.0
-Dpackaging=jar
```

Preparation	
Observation	
Output	
Viva	
Record	
Total	

RESULT:

Hence the multimodule data engineering project in java using maven build tool has been implemented and the output has been verified successfully.