MAVEN—

It is a build automation open source tool.

It is used in devops as it  improves project performance by optimizing the build process, reducing build times.

It allows developers to complete state of development in shortest period of time.

IT is a software program that automates the process of transforming the source code into a deployable and executable format

Maven was developed by Apache company.

It simplifies the build process by providing a standardized way to manage project dependencies, run tests, package applications for deployment. Maven automates the process of downloading the necessity libraries from the central libraries.

Advantages of maven:

* It is a free and open source.
* Dependency management – automatically handles dependencies, ensuring the correct version of libraries are used.
* Automates testing, packaging, deployment.
* Platform independent.
* Artifact management and repository: Supports repositories like Nexus and Artifactory for efficient artifact storage.

Maven workflow—It follows a structured workflow for building, testing and deploying.

1. Developers write code and push it to Github
2. Maven compiles the code and packages it into different formats.

-JAR(java application)

- WAR( web application)

- EAR (Enterprise application)

1. These packages are the copied to a webserver for deployment
2. End users can then access the application.

POM.xml in maven—

POM—project object model

It is a cental configuration file in in a Maven-based project. It contains information about the project. It helps in dependency management, lifecycle management.

Ensures all the necessary tools are included in the project.

Parent POM -- supports hierarchical configuration through parent-child POMs.

POM.xml is a heart of maven project defining plugins, dependencies.

It plays a key role in large scale software development.

Plugins—plugin is a component of maven it adds a specific functionality to build the process. It helps to automate the tasks like testing, deploying, and reporting.

Types of Plugins in Maven: there are 2 types of plugins in maven

* Built- in plugins – Installed once and used automatically. Used during the build lifecycle and executed during the specific build phase.
* Added plugins – Installed separately and reusable.

Maven Repositories:

It is a storage location where dependencies are stored and retrieved by maven.

* Local Repository
* Remote repository
* Central respository

Local Repository—This repo is a directory on the developers machine where maven stores all the artifacts resolved from remote repositories.

Central repository-- It contains a large number of commonly used libraries. It is the default repository used by the maven.

Remote repository—This are set up the third-party or any organizations to host their artifact.

Maven lifecycle: It is a sequence of phases to build a maven project.

Types of maven build lifecycle—

* Default
* Clean
* Site

Default—It takes the code from the devlopers and perform functions

* + Validate phase- check the project configuration and validate if all information required is present.
  + Compile phase- compiling the source code of the project.
  + Test phase- Execute unit test using test framework
  + Package phase – It bundles the compiled file into a WAR or JAR file
  + Verify phase— checking on the packaged code
  + Install phase—Install the package to the local repository
  + Deploy – Deploy the package to a remote repository.

Clean—Handles project cleaning , and checking that all the artifacts generated by the previous builds are removed or not.

Pre-clean—Checks for war/jar

Clean—It will delete the older jar/war file

Post- clean – the new generated war/jar files will be saved.

Site—Manages the creation of the project site documentation. It allows developers to generate a project documentation automatically.

It consists of 4 phases:

Pre-site—It is used to performing pre-processing tasks such as gathering data, setting up configuration

Site—It uses plugins like MAVEN SITE PLUGIN to create HTML pages

Post-site – It is like post processing tasks like modifying the generated documents. This ensures that the document is ready for the deployment.

Site-deploy—It is like publishing the document to the external web server from local machine.

What is ANT?

ANT – Another Neat Tool – It is a older version of maven. It is also a automation tool which is developed by apache.

In ANT we can customize the scripts in maven we cant customize the script it is standard version but in ANT customization available. This ANT scripts are not reusable. It can be built on any kind of projects.

It is used to perform platform specific tasks . It provides interface to develop custom tasks.