Maven –

Apache Maven is a software project management and build management tool for Java Frameworks.

1. Why Maven?

* Central repository to get dependencies
* Maintaining common structure across the organization
* Flexibility in Integrating with CI tools
* Plugins for Test framework execution.

1. Install Maven
2. Set System variables to recognize Maven
3. Understanding Maven terminologies

**Artifact**: An artifact is a file, usually a JAR, that gets deployed to a Maven repository.

**GroupId**: groupId will identify your project uniquely across all projects,

**archetype:generate** ; Generates a new project from an archetype

1. Creating Maven Project

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

1. Integrate Maven with Eclipse
2. Maven Phases for Test Automation
3. Clean, compile, test
4. Understanding POM.xml file dependencies..
5. How to find the dependencies of the Softwares?
6. Importance of Maven Sure fire plugin
7. Running Tests with Surefireplugin
8. Integrating Testng into Maven
9. Testng xml files configuration in POM file
10. Setting up Profiles in POM.xml file
11. Running selected Tests only with Maven commands
12. Maven Sure fire reports

262. Importance of Maven in Framework development

what is Maven? - Maven is a software project management. so the project, what you're working on,so Maven can take care of few thingsin managing that project.

Maven take care in building the robust framework. so project in the sense, it could be the framework,or it could be some development code,or it could be test cases or anything.

So whatever the technical project you have, so Maven can be used to maintain and manage that project, and also, it can act as a build management tool for your frameworks.

Maven helps us in build management tool for all these frameworks, for Selenium, REST Assured API, and Appium. So if you have any other code which is written in Java,

you can still use Maven comfortably as a management tool, as well as, you know, managing your framework.

 Maven have its own repository website. So basically here you will get JARs of all the Java projects. Not only Java, you will also get some Python or whatever.

Ex : So you have developed a base framework, and now you want to share that framework to another guy. so how do you give?

You just share that project in email with a ZIP format or with a shared folder.

But once he take that project into his own local, he have to do the step again.

Because you cannot send the JARs and location as well, right?

263. Installing and configuring Maven

**maintaining common structure across the organization.**

Now, so in a company there are multiple teams working on multiple frameworks,

So each team defines their framework with different folders and different structures,

So some maintain a folder and package for test data, and some teams don't maintain

the folders for test data.and some teams break the test casesinto multiple packages.

So in this way, there is no consistency in defining the folder skeleton,

or a framework skeleton, in the companies.

There are multiple teams and there could be more than a hundred skeletons, a hundred different type of framework structures, you see. So to bring the consistency across the organization, so you want to maintain one common structure, It could be Selenium or it could it could be mobile framework or API framework or even development.

Even development website, you know, those framework as well. There should be one common framework structure, So Maven can help us in giving that common structure.

So if you want to use the Maven project, Maven automatically suggests some templates for us. For test project, it suggests one template. And for Java development project,

it suggests one more template. So simply we can convert our project using a Maven and get that template and then introduce all our test cases according to that template or inject the other code into those template.

Google -> maven in 5 minutes -> you can see the  [standard project structure](https://maven.apache.org/guides/introduction/introduction-to-the-standard-directory-layout.html).

So in real time, most of the projects use Maven as their template for framework development.

**Flexibility in integrating with CI tools.**

if you want to run a hundred tests on one night you need some continuous integration tool like Jenkins. so automatically by the time you come in the morning, all the a hundred tests will be executed step by step. You need not go in every time do right click and run that.

So for that you need to have some build management tools to provide that information to Jenkins. we will trigger and schedule at one particular time in Jenkins.

There should be one build management toolfor your framework to integrate with CI tool.

And here we are using Maven as our build management tool.

**Plugins**

You have some excellent plugins for testing using Maven.So they support TestNG and they support JUnit also.So you can simply use all the features of TestNG so there is some mechanism where we'll be applyingto use all these framework features,what we learnt on TestNG and JUnit in the Maven as well.

If you want to download maven the pre-requiste is java and after download java you need toset the system variables.

Google -> maven download -> if you working on windows you need to download ( bin.zip ) unzip and set the system variable

Advanced system settings -> advance ->envirment variable->system variable -> new-> MAVEN\_HOME, c:/work?apche-maven-3.3.9bin/apache-maven-3.3.9 -> k

Go to bin and copy the bin path and put in the path varaiable.

Command prompt – mvn –version

264. Creating Maven Project and Understanding its Terminologies

So artifact and group ID are the most commonly used in the Maven

Maven will uniquely identify Selenium project with the group ID given in mvn repo.

out of hundreds and thousands of projects present in Maven Repository, Maven will identify

the project uniquely by the group id what you are passing.

So when I said that you have to use that four lines of code in that four lines of code, one line is about group ID in the same way, artifact ID is a sub project of the group ID now.

so group ID is a main head.

So selenium is a group ID is a big project in that there are many sub projects, like if you want to automate it in Java, you have to use Java sub project so that sub project details are passed as part of artifact ID. Artifact ID is nothing but a jar name.

So in the real time, when you are building a framework, first you create a maven project with a skeleton and slowly you will start building test cases inside it.so once you have defined outer skeleton of the project and framework folders and then you start building test cases inside it.

Eclipse-> new->project->maven project->next->groupid(org.apache.maven.archetypes) artifactid(maven-archetype-quickstart) (1.1) – next->groupid(qaclickacademy) artifactid(mavenjava) -> finish

when project is created in Eclipse, the project name will be nothing but artifact ID.

Now, in this main slash Java folder, we will write all utilities page object files.

What all we need for a framework test framework in the test slash Java package, you will write all your automation test cases.

So like this we will have separation between test cases and the utilities.

So all these ready made template is directly provided by the Maven.

265. Understanding POM.xml file and its dependencies

Create 3 classes under the package ( RESTAPITest, SeleniumTest, AppiumTest )

Maven is commonly used across all these three tools in framework development.

On each and every class write 2 test case and print

Ex: public void borwserautomation()

{

System.out.println(borwserautomation)

}

Now I want to run all these six test cases.So what command should I give for all these six test cases to trigger? Before that you want to add the dependencies – ( seleniumjava, testing, restassured, appium )

 Maven tells that we have a plugin called Surefire plugin with which you can execute

all your tests in your Maven project. you need to dump that plugin into your pom.xml file.

Google-> mavensurefire plugin -> usage-> copy the plugin and paste it in the pom.xml file.

And above the dependiecnies.

So this plugin maven surefire plugin will help to execute all your test cases present in your test folder.

Interview que :  what plugin you can execute all your test cases in your Maven project, it's with Surefire plugin.

266. Importance of surefirePlugin in executing Tests

we'll understand three main commands here of the Maven

First is clean. So when you give mvn space clean,

So when you give this command, it'll delete all temporary files or builds, whatever current project have.So it basically cleans the project and delete all the previous references and the builds. So basically, this is preferred before you execute tests, but it's up to you.

if you see any build errors, and when you fix that, it's better to clean the project and then start executing your stuff.

So the commands from where you are running should point to your pom.xml.

 when you execute this commands, when you hit all these commands, these commands talk to this pom.xml and triggers Maven executions.

when I say mvn compile and hit Enter,it'll scan and check the syntax validations

of all your tests.

Mvn test command will actually trigger your test execution,

if Maven want to recognize all your test cases inside this test folder, if it want to recognize,

then you should always put test word at the end of the each Java class filename

So Maven uses an algorithm which expects test keyword at the end of the each Java class file. It filters based upon that logic,and it executes all your Java files.

And tomorrow, if you go and change SeleniumTest to only Selenium by skipping this test word in your folder and then run your test, Maven will not pick this file, because there is no test word in the filename. So as per Maven algorithm to pick and execute, it'll always look for test filename at the end of your file.

267. Integration of Testng with Maven

Use of TestNg - in this folder there are 100 tests to execute and if you want to execute only 40, which are most important, you can configure that in your testing XML file.

And if you trigger that XML file automatically, those important 40 tests only will be triggered.

So that's why we configure that XML file by picking those 40 tests.

now I want to create the XML file here and I will pass these three test details there so that if I trigger that XML file automatically, all these three tests will be executed from that XML file.

How I need to run the testing.xml using maven ? – in command prompt – if you give mvn test

Maven will come again to this folder only and it will execute these three.

But you want to execute this file which is present in the project level, not your test package files.

Earlier what we have seen is that default plugin. that runs and execute all.

But if you want to tweak by running only the XML file, then copy this configuration carefully and place it here the version.

[Maven Surefire Plugin – Using TestNG (apache.org)](https://maven.apache.org/surefire/maven-surefire-plugin/examples/testng.html)

1. <configuration>
2. <suiteXmlFiles>
3. <suiteXmlFile>testng.xml</suiteXmlFile>
4. </suiteXmlFiles>
5. </configuration>
6. So XML file you need to pass the path as this path is in, you know, parent level.

You can just pass that name here. ( after maven surefirepugin add this after version )

If you want to execute one single test - mvn -Dtest=AppiumTest test

268. Switching the Tests with Maven profiling

let's assume that there is one more XML file where you want to include all the test cases.

It's basically kind of regression.

Ex : testing2.xml is regression – here we place all the classes ( test cases )

Testing.xml is smoke – here we place only fee classes( test cases )

So now there are two types of executions.

So one time you want to run only smoke and another time you want to run only regression.

So how do you control that XML files execution from your maven? - So if that is your criteria, we will build profiles here.

Under url you can add profiles

<profiles>

<profile>

<id>Regression</id>

</profile>

<profile>

<id>Smoke</id>

</profile>

</profiles>

Copy sure-fire plugin build to build in profile under id regression.

And in pom.xml modified the testng.xml file in configuration on surefireplugin

So Profiles is a parent. Under this parent profiles, you can have multiple child profiles.

So I am creating one child profile. I am giving name to it as regression.

So in this regression I want to include all the test cases.

So for that there is one XML file ready for me which does that.

It is nothing but testing2.

I'll now go(pom.xml) and change my configuration in regression to testng2.

Mvn test -PRegression – only it run testng2

In real time So regression may run twice in a week.

In that case, every day smoke is must for every build.

So if someone asks you to run a smoke, you need not come and change the XML file name every time andthen trigger.

Just set up all kind of profiles smoke regression sanity in your pom.xml file and based upon the requirement, just give this ID name and it should trigger that specific test cases.

 if you recap, u know what is group ID what is artifact ID & artifact ID will be your project name, And then you know the dependencies. How Maven look at dependencies.

So we will not hard code jars and it'll not always pick the jars from internet.

It'll check in your local folder, which is stored into repository and what all jars you need for your project, you need to bring it then. And also you know what is importance of surefire plugin because it run your test cases. And you have to make sure you put it test as your test name. But again, using TestNG, you can configure your testng XML file, using configuration.

At the same time, you can have a multiple testng XML suits, by maintaining profiles.

Quiz :

1. Identify the correct statement about Maven.

. Build management tool for java framework

. Repositories for getting the project dependencies

. can be integrated easily with continuous integration tools like Jenkins

1. Which plugin helps to execute test cases from test folder in Maven project?

Surefire plugin

1. Suppose your test suite contains Regression and Sanity test cases having two profiles in pom.xml. Each of them is integrated with TestNG and having separate TestNG xml file. How will you trigger only the Sanity test cases?

Mvn test -PSanity

1. Once Maven reads the pom.xml, first were does it search for the dependencies?

Local Repository

1. Suppose we want to publish our project in Maven, what is the mandatory piece of information that is needed for doing that?

groupId, ArtifactId,Version

1. Which maven command does the compilation and identifies if there are any syntax errors in the code?

Mvn compile