

Maven :-

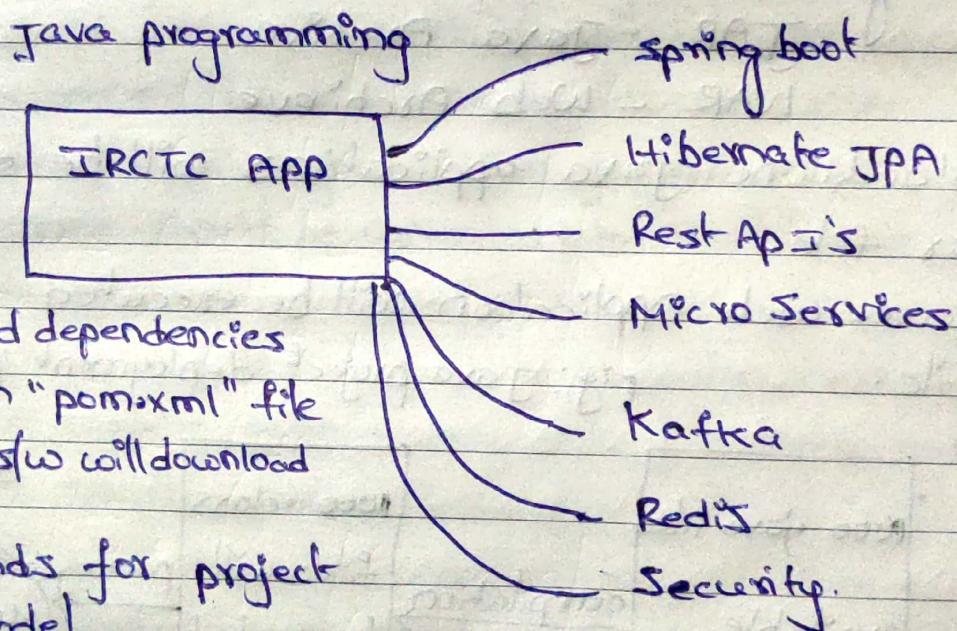
- Maven is a free and open source software given by Apache organization.
- Maven s/w is developed using Java programming language.
- Maven is used to perform Build Automation for Java projects.
- Maven is called as Java build Tool.

What we can do using maven :-

1) We can create project folder structure.

2) We can download project dependencies

(ex: springboot, hibernate, kafka, redis, mail, log4j, junit -etc).



5) → Note: Required dependencies

we will add in "pom.xml" file

6) Then maven s/w will download them.

7) pom stands for project object model

8) when we create maven project then pom.xml file will be created automatically.

9) pom.xml will act as input file for maven software.

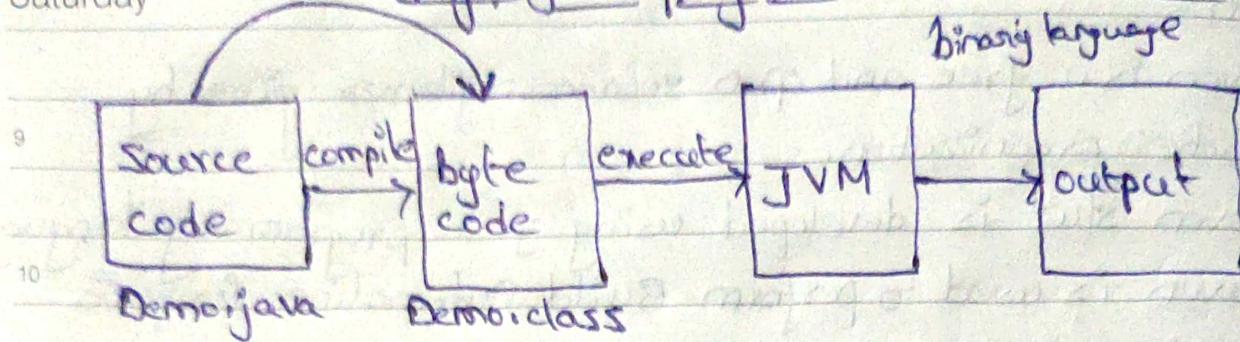
10) we can compile project source code using maven.

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Saturday

Fig:- Java program execution process

binary language



Note:- Compilation means converting Java source code into byte code.

Demo.java — compilation —→ Demo.class

Note:- java project means collection of java programs

4) we can package java project as jar or war file using maven.

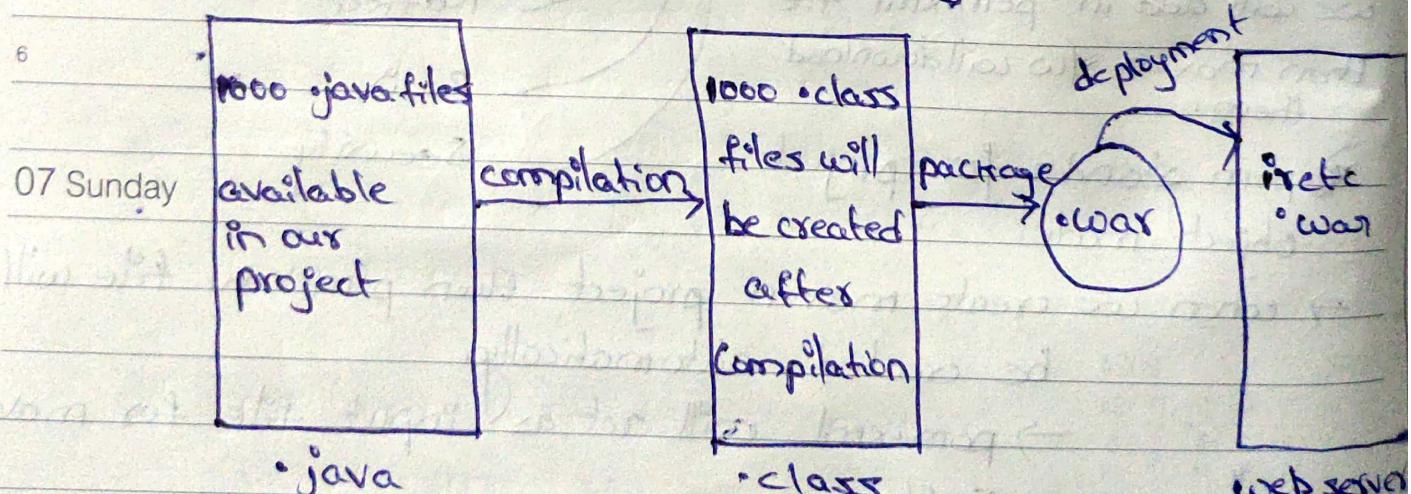
JAR - Java Archive

WAR - Web Archive

→ standalone Java applications will be executed using jar file.

→ Java web application will be executed using war file.

Fig: Java project deployment process



• java

• class

web server

compile + package = Build

- Java is a free s/w given by sun microsystems. Monday
- To develop one java project we will use several frameworks like spring, hibernate etc., along with java.
- we need to download those frameworks and we should add to our java project.
- These frameworks we are using in our project are called as project dependencies.
- Instead of we are downloading dependencies, we can tell to maven s/w to download dependencies.

(6)

- 1 → Java is a programming language
- 2 → Java provided by sun microsystems (oracle acquired sun micro)
- 3 → Java is a high level programming language.
- 4 → Java is simple programming language.
- 5 → Java programme files will have .java extension.  
Ex: Demo.java, Hello.java, Driver.java, calculator.java etc.,
- 6 → Java programme should be converted into Machine understandable formate to execute.
- 7 → Java programs (.java file) contains source code.
- 8 → we need to compile java source code into byte code using java compiler(javac)  
Ex: javac Demo.java
- 9 → when we compile java code it will create .class file
- 10 → we need to execute .class file to run the java program.

Ex: java Demo

- when we run java programme using Java command, JVM will start and it will

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Tuesday

execute Java programNote: JVM stands for Java Virtual Machine

- 9 → JVM will convert byte code into machine understandable code.
- 10 → Java project contains several Java programs (.java files)
- we need to compile project source code into byte code.
- 11 → when we compile project source code we will get
  - class files.
- 12 → To deploy Java project, we will package all .class files as JAR or WAR file.

JAR : Java Archive

WAR : Web Archive

- 1 → standalone Java projects will be packaged as JAR file.
- web Applications will be packaged as WAR file.

### Maven Installation :-

- 1) Download and install Java software.
- 5 → When we install Java we will get below 2 things
  - a) JDK (Java Development Kit)
  - b) JRE (Java Runtime Environment)
- JDK contains set of tools to develop Java programs.
- JRE contains platform/environment which is used to run Java programs.
- 2) Set JAVA\_HOME in Environment Variables.  
User Environment Variables : specific to particular account.  
System Environment Variables : for all accounts.

Note : Environment Variables will be used by operating system to know where a particular software installed.

Wednesday

JAVA\_HOME = C:\program files\Java\jdk1.8.0\_202

3) Set path for JAVA (Go to System Env Variables) → Env Variables → System Variables → Select path and click on Edit then add JDK path).

path = C:\program files\Java\jdk1.8.0\_202\bin

For checking installed or not → java -version

4) Verify Java installation by executing below command in "command prompt"  
> java -version.

Note : It should display java version which we have installed.

5) Download Maven Software from Apache website.

Link to download : <https://maven.apache.org/download.cgi>  
File Name : apache-maven-3.8.5-bin.zip.

6) Set MAVEN\_HOME in system Environment Variables.

MAVEN\_HOME = C:\apache-maven-3.8.5

7) Set path for Maven

path : C:\apache-maven-3.8.5\bin

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Thursday

8) open command prompt and verify Maven

9 Installation using below command.

mvn -version

10

### Maven Terminology:

11 archetype

group id

artifact id

1 packaging

2 → Archetype represents what type of project we want to create.

3 maven-archetype-quickstart : It represents java standalone application.

4 maven-archetype-webapp : It represents java web application

5 Note : Maven providing 1500+ archetypes.

→ group id represents company name or project name.

→ artifact id represents project name or project module name.

→ packaging represents how we want to package our java application (jar or war)

Saturday

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## How maven will download dependencies

- 9 → Maven will download repository using dependencies using repository.
  - 10 → In maven we have 3 types of repositories.
    - 11 1) Central Repository
    - 2) Remote Repository.
    - 12 3) Local Repository.
  - 13 1 → Central repository is maintained by apache organization.
  - 2 → Every company will maintain their own remote repository.
  - 3 → Local repository will be created in our system  
(Location : C:/users/<uname>/m2)
  - 4 → When we add dependency in `pom.xml` maven will search for that dependency in local repository. If it is available it will add to project build path.
  - 5 → If dependency is not available in local repository then maven will connect to central repository or remote repository based on our configuration.
- 14 Sunday
- Note:- By default maven will connect with central repository. If we want to use remote repository then we need to configure remote repository details.
- Note:- Every software company will maintain their own remote repository (Ex:- Jfrog)

Monday

Configuring Remote Repository:-

```
<repositories>
    <repository>
        <id>id</id>
        <url>jfrog-repo-avil/</url>
    </repository>
</repositories>
```

Maven Goals:-

- 1) clean
- 2) compile
- 3) test
- 4) package
- 5) install.

Note: jar or war file will be created in target folder.

- clean goal is used to delete target folder maven.
- compile goal is used to compile project source code .  
compiled code will stored in the target folder.  
•  $\text{java} -\text{compile} \rightarrow \text{.class}$
- test goal is used to execute unit test code for of our application.
- package goal is used to generate jar or war file for our application based on packaging type available in pom.xml file.
- Install goal is used to install our project as dependency in maven local repository.

Note: Every maven goal is associated with maven plugin .

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When we execute maven goal then respective maven plugin will execute to perform the operations.

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Syntax: mvn <goal-name>

Note: we need to execute maven goals from project folder.

- 1) mvn clean
- 2) mvn compile
- 3) mvn test
- 4) mvn package
- 5) mvn install

if there is any update to

spring then our project execution will fail

### Maven Repositories

