

# DEPENDENCY MANAGEMENT AND BUILD TOOLS

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## MAVEN



Apache Maven is a software project management and comprehension tool

Maven provide :

- ▶ Build tools
- ▶ Dependency management tools
- ▶ Unit test reporting
- ▶ Project templating (Archetypes)

# MAVEN INSTALLATION

Maven Installation documentation

<https://maven.apache.org/install.html>

# POM.XML

- ▶ It stand for Project Object Model.
- ▶ It contains information and configuration for Build Application
- ▶ When maven executes task or goals, it will look for file pom.xml in directory, get the build configuration and execute it

# POM.XML

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns=http://maven.apache.org/POM/4.0.0 ...>
  <modelVersion>4.0.0</modelVersion>
```

```
    <groupId>com.enigma</groupId>
    <artifactId>example-project-maven</artifactId>
    <version>1.0-SNAPSHOT</version>
```

As a jar file name

```
  <dependencies>
    ...
  </dependencies>
```

Dependencies section

```
  <build>
    <plugins>
      ...
    </plugins>
  </build>
```

Plugins section

```
</project>
```

# MVN COMMAND

Maven command includes build life cycle, build phase and build goals

- ▶ **clean** : remove all files generated by the previous build
- ▶ **package** : take the compiled code and package it in its distributable format, such as a JAR.
- ▶ **install** : install the package into the local repository, for use as a dependency in other projects locally.
- ▶ **deploy** : done in an integration or release environment, copies the final package to the remote repository for sharing with other developers and projects.
- ▶ etc ...

# DEPENDENCIES

```
<dependencies>
```

```
<dependency>
```

```
<groupId>commons-io</groupId>
```

```
<artifactId>commons-io</artifactId>
```

```
<version>2.8.0</version>
```

```
</dependency>
```

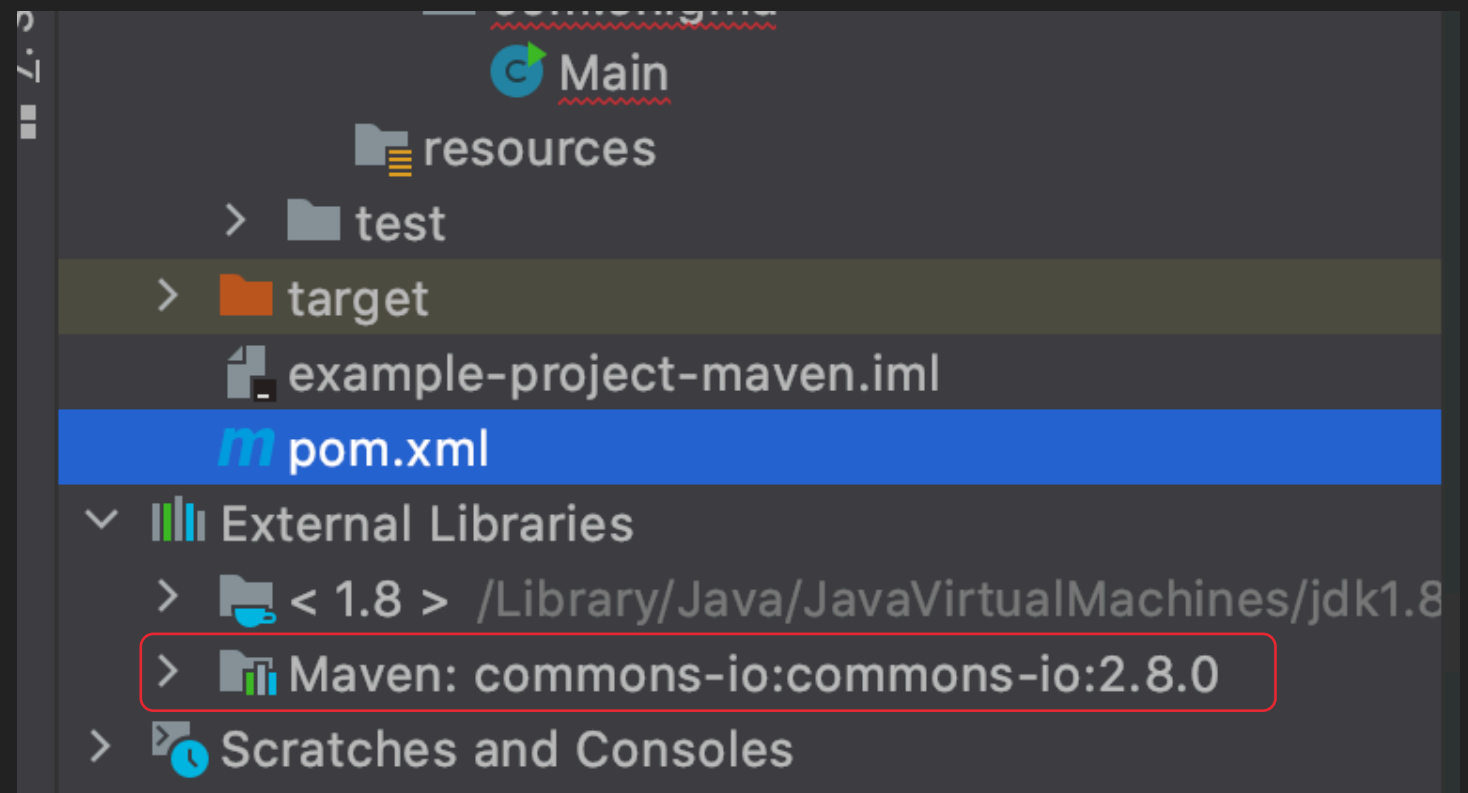
```
...
```

```
</dependencies>
```

Dependency is library or artifact you will use in your project.

Try, run : `mvn clean package`

you will have the artifact as a External Library



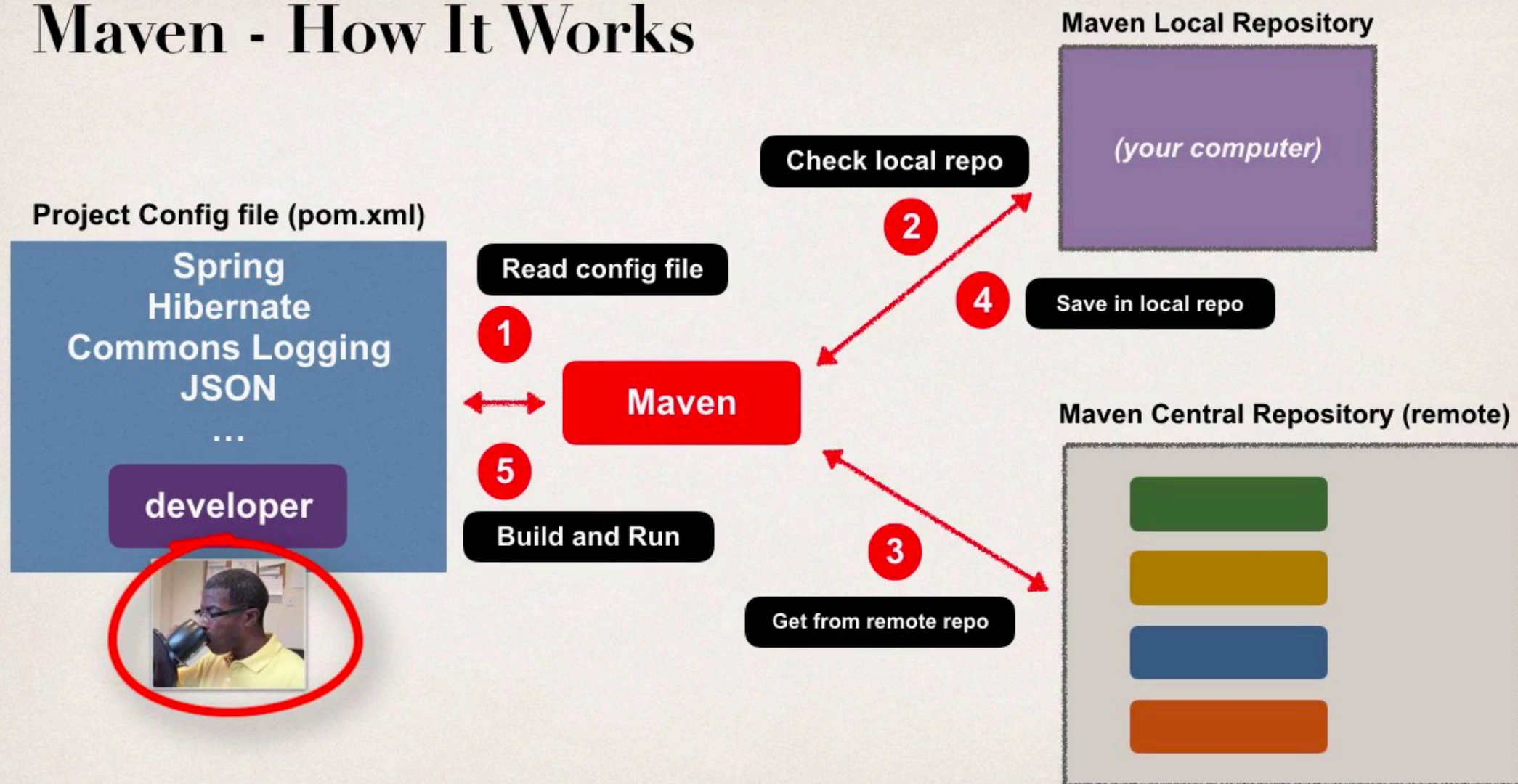
# WHERE MAVEN GET THOSE ARTIFACT?

- ▶ Try to find /.m2 folder in your user Directory
- ▶ You will find /repository folder
- ▶ Repository folder contains artifact that you will need. This repository folder act as Local Artifact Repository



# HOW IT WORKS

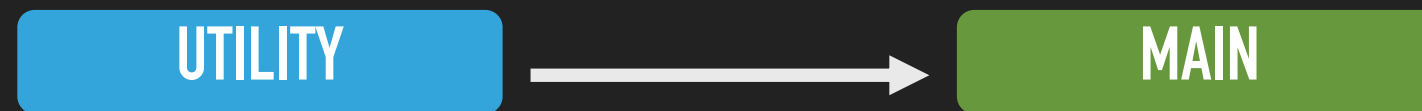
## Maven - How It Works



# WHERE IS MAVEN CENTRAL ?

- ▶ Is on the Internet. <https://repo.maven.apache.org/maven2/>

# DEPENDENCY BETWEEN LOCAL PROJECT



utility-example pom.xml

Project Structure:

- utility-example ~/Academy/utility-example
  - .idea
  - src
    - main
      - java
        - com.enigma
          - DateUtility
    - resources
    - test
    - target
      - classes
      - maven-archiver
      - maven-status
      - utility-example-1.0-SNAPSHOT.jar
- External Libraries
- Scratches and Consoles

pom.xml (utility-example) pom.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.enigma</groupId>
  <artifactId>utility-example</artifactId>
  <version>1.0-SNAPSHOT</version>

</project>
```

example-project-maven pom.xml

Project Structure:

- example-project-maven ~/Academy/example-proj
  - .idea
  - src
    - main
      - java
        - com.enigma
          - Main
    - resources
    - test
    - target
  - example-project-maven.iml
  - External Libraries
    - < 1.8 > /Library/Java/JavaVirtualMachines/jdk1.8
    - Maven: commons-io:commons-io:2.8.0
  - Scratches and Consoles

pom.xml (example-project-maven) pom.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<project xmlns="http://maven.apache.org/POM/4.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.enigma</groupId>
  <artifactId>example-project-maven</artifactId>
  <version>1.0-SNAPSHOT</version>

  <dependencies>
    <dependency>
      <groupId>com.enigma</groupId>
      <artifactId>utility-example</artifactId>
      <version>1.0-SNAPSHOT</version>
    </dependency>
  </dependencies>
</project>
```