MAVEN

Project Management Tool

CS-359

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Overview

- Introduction -- What is Maven?
- Installation
- Creating a Project
- POM
- Build the Project
- Maven Online Repository

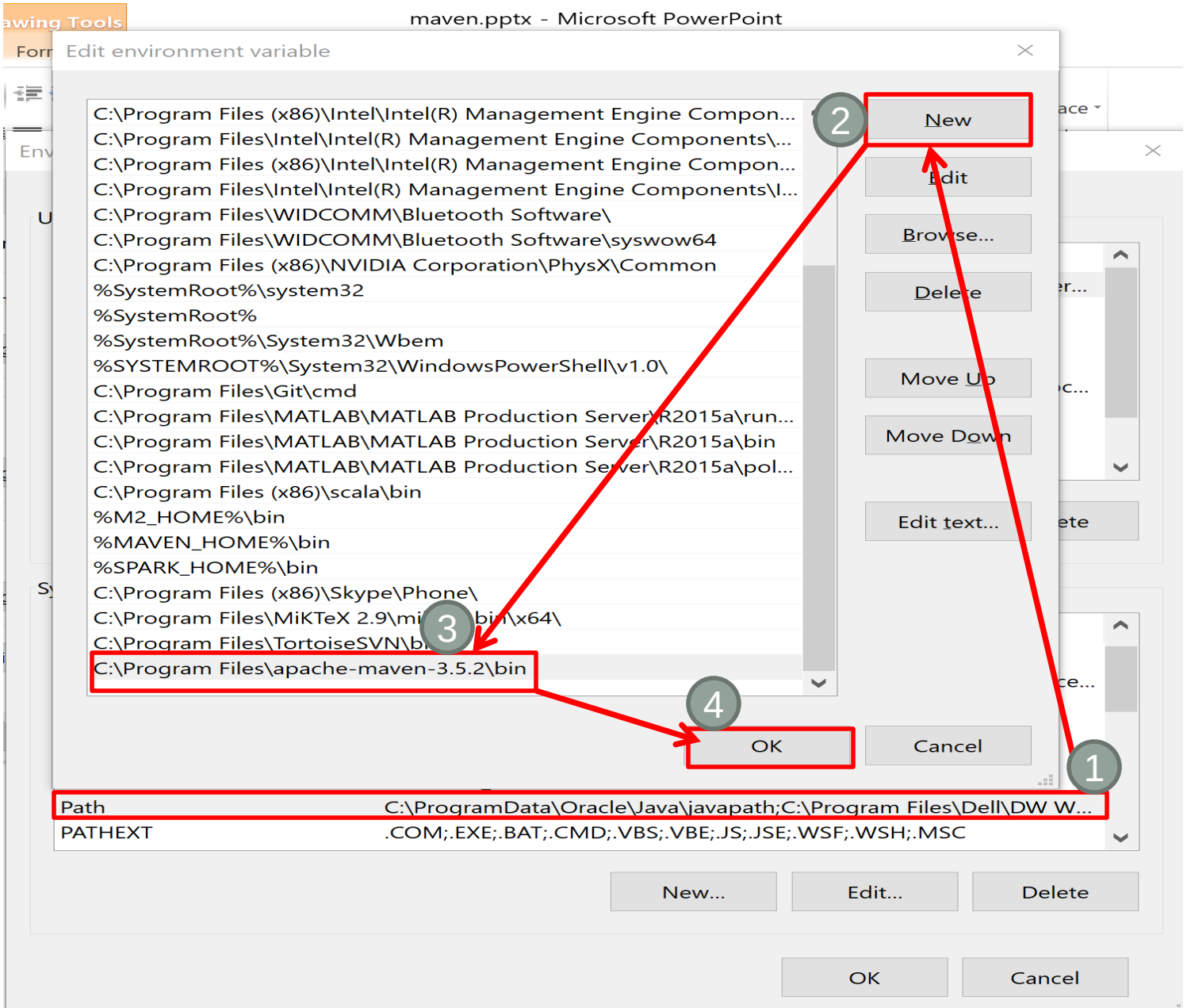
What is Maven?

- Maven, a Yiddish word meaning *accumulator of knowledge*
- Provides
  - A standard way to build the projects
  - A clear definition of what the project consisted of
  - An easy way to publish project information
  - A way to share JARs across several projects

Installation

- *Maven is a Java tool, so you must have Java installed in order to proceed*
- Download ready-made binary distribution archive (**apache-maven-3.5.2-bin.zip**)
- Unzip apache-maven-3.5.2-bin.zip to the destination folder C:\Program Files\
- Add to the PATH environment variable the value C:\Program Files\apache-maven-3.5.2\bin
- On windows right click to **“This PC>Properties>Advanced System Settings>Advanced(tab)>Environment Variables(left click)”** and then follow the instructions of the next slide

On Windows


maven.pptx - Microsoft PowerPoint
Edit environment variable
C:\Program Files (x86)\Intel\Intel(R) Management Engine Compon...
C:\Program Files\Intel\Intel(R) Management Engine Components\...
C:\Program Files (x86)\Intel\Intel(R) Management Engine Compon...
C:\Program Files\Intel\Intel(R) Management Engine Components\I...
C:\Program Files\WIDCOMM\Bluetooth Software\
C:\Program Files\WIDCOMM\Bluetooth Software\syswow64
C:\Program Files (x86)\NVIDIA Corporation\PhysX\Common
%SystemRoot%\system32
%SystemRoot%
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
C:\Program Files\Git\cmd
C:\Program Files\MATLAB\MATLAB Production Server\R2015a\run...
C:\Program Files\MATLAB\MATLAB Production Server\R2015a\bin
C:\Program Files\MATLAB\MATLAB Production Server\R2015a\pol...
C:\Program Files (x86)\scala\bin
%M2_HOME%\bin
%MAVEN_HOME%\bin
%SPARK_HOME%\bin
C:\Program Files (x86)\Skype\Phone\
C:\Program Files\MiKTeX 2.9\mi bin\x64\
C:\Program Files\TortoiseSVN\bi
C:\Program Files\apache-maven-3.5.2\bin
New
Edit
Browse...
Delete
Move Up
Move Down
Edit text...
OK
Cancel
1
2
3
4
Path
C:\ProgramData\Oracle\Java\javapath;C:\Program Files\Dell\DW W...
PATHEXT
.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;.JSE;.WSF;.WSH;.MSC
New...
Edit...
Delete
OK
Cancel

On Ubuntu

- **Search Maven package:**
  - In a terminal, run ***apt-cache search maven***, to get all the available Maven package.
- **Install it**
  - Run command ***sudo apt-get install maven***, to install the latest Apache Maven.

Validate Installation

- Open cmd/terminal and type:
  - “mvn –v” or “mvn --version”
  - If everything is done correctly, you should see something similar to the following response message:

```
C:\Users\Sgo>mvn -v
Apache Maven 3.3.9 (bb52d8502b132ec0a5a3f4c09453c07478323dc5; 2015-11-10T18:41:47+02:00)
Maven home: C:\Users\Sgo\apache-maven-3.3.9-bin\apache-maven-3.3.9
Java version: 1.8.0_101, vendor: Oracle Corporation
Java home: C:\Program Files\Java\jdk1.8.0_101\jre
Default locale: en_US, platform encoding: Cp1252
OS name: "windows 10", version: "10.0", arch: "amd64", family: "dos"
```

Creating a Project

- Create a directory somewhere and start a shell in that directory. Execute the following command:
  - mvn archetype:generate
    -DgroupId={reverse-domain-packages}
    -DartifactId={project-name}
    -DarchetypeArtifactId=maven-archetype-quickstart
    -DinteractiveMode=false
  - Example:
    - mvn archetype:generate
      -DgroupId=gr.uoc.csd.cs359
      -DartifactId=LQ
      -DarchetypeArtifactId=maven-archetype-quickstart
      -DinteractiveMode=false

Creating a Project (cont.)

- *If you have just installed Maven, it may take a while on the first run. This is because Maven is downloading the most recent artifacts (plugin jars and other files) into your local repository. You may also need to execute the command a couple of times before it succeeds. This is because the remote server may time out before your downloads are complete. Don't worry, there are ways to fix that.*
- You will notice that the *generate* goal created a directory with the same name given as the artifactId. Change into that directory.

Project Object Model

- The directory you have just created has the following standard project structure:

```
my-app
|-- pom.xml
`-- src
    |-- main
    |   `-- java
    |       `-- com
    |           `-- mycompany
    |               `-- app
    |                   `-- App.java
    `-- test
        `-- java
            `-- com
                `-- mycompany
                    `-- app
                        `-- AppTest.java
```

Project Object Model (cont.)

- The directory you hav… ing standard project stru…

A single configuration file that contains the majority of information required to build a project in just the way you want.

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    |-- main
    |   `-- java
    |       `-- com
    |           `-- mycompany
    |               `-- app
    |                   `-- App.java
    `-- test
        `-- java
            `-- com
                `-- mycompany
                    `-- app
                        `-- AppTest.java
```

Project Object Model

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Project Object Model (cont.)

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    |       `-
    |
    |
    |
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                `-- mycompany
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                        `-- AppTest.java
```
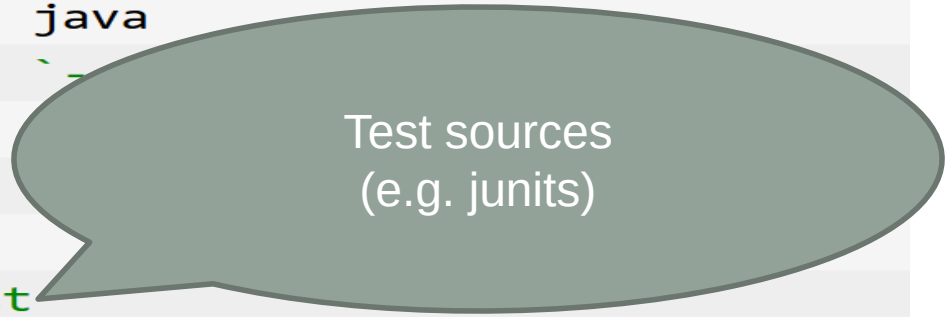



Project Object Model (pom.xml)

```xml
<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.mycompany.app</groupId>
  <artifactId>my-app</artifactId>
  <version>1.0-SNAPSHOT</version>
  <packaging>jar</packaging>

  <name>Maven Quick Start Archetype</name>
  <url>http://maven.apache.org</url>

  <dependencies>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>4.8.2</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
</project>
```

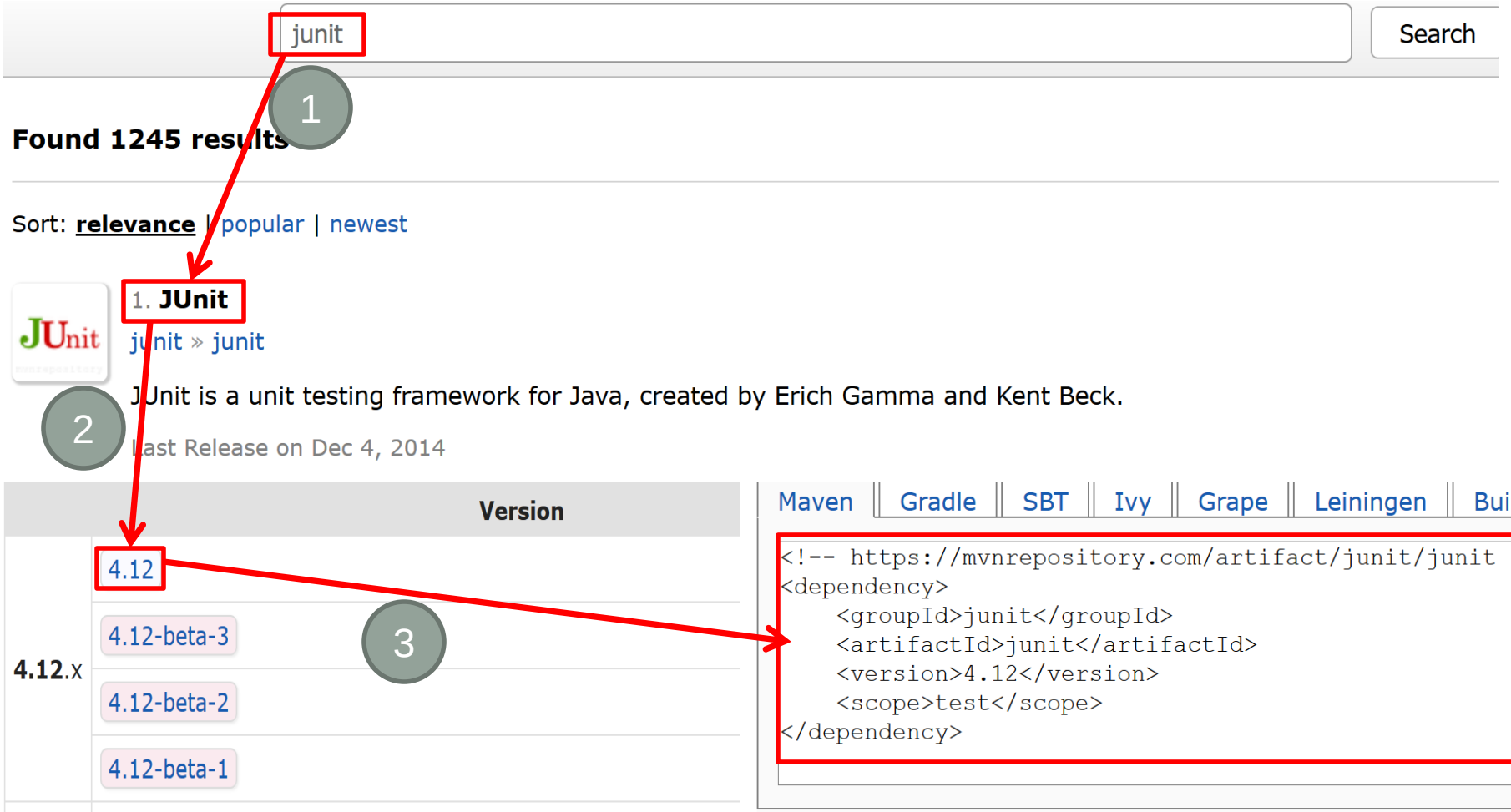
Dependencies allow for automatic jar download during the build process. (e.g. junit-4.8.2.jar)

Build Project

- To build the project execute the command inside the newly created project folder:
  - mvn package
  - Maven will automatically:
    - validate
    - generate-sources
    - process-sources
    - generate-resources
    - process-resources
    - compile
- You may test the newly compiled and packaged JAR with the following command:
  - java -cp target\LQ-1.0-SNAPSHOT.jar gr.uoc.csd.cs359.App

Maven Online Repository

You can search for dependencies at maven's online repository:
https://mvnrepository.com/
It provides you with search



Closing Remarks

- Using an IDE (e.g. Netbeans, Eclipse) you may not need to download and install maven. Some IDEs contain maven as a build in plugin.
- Big part of the tutorial was taken from:
  - https://maven.apache.org/index.html
- Other useful links:
  - https://platform.netbeans.org/tutorials/nbm-maven-modulesingle.html
  - https://mvnrepository.com/
  - http://www.oracle.com/technetwork/java/javase/downloads/index.html


THE END