



# Enterprise Applications

Your starting toolbox

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Loredana Costea - Software Engineer

March 2024

# Training Agenda

Enterprise applications with Spring

**W1. Enterprise applications - Your starting toolbox.**

**W2. How Spring can improve your life as a programmer.**

**W3. Dive into the Web.**

**W4. What is Spring Boot and why is everyone using it?**

**W5. Improve your application robustness with testing and API documentation.**

# Trainers

Java Technology Group



**Irinel Dan**  
*Software Engineer*



**Sorin Miron**  
*Software Engineer*



**Alex Babei**  
*Software Engineer*



**Loredana Costea**  
*Software Engineer*



**Emilian Marian**  
*Software Engineer*

# Let's get to know each other



# Week 1 Timeline

9th March

## Introduction, Java, IDE

- ❖ Let's get to know each other
- ❖ What is a Java application?
- ❖ Install & Setup Java and IDE

**Break** - Get up, grab a cup of coffee/tea and :)

## Maven

- ❖ What is Maven?
- ❖ Install & Setup Maven
- ❖ Build a Java application with Maven and IntelliJ IDEA

**Break** - Get up, grab a cup of coffee/tea and :)

## Apache Tomcat

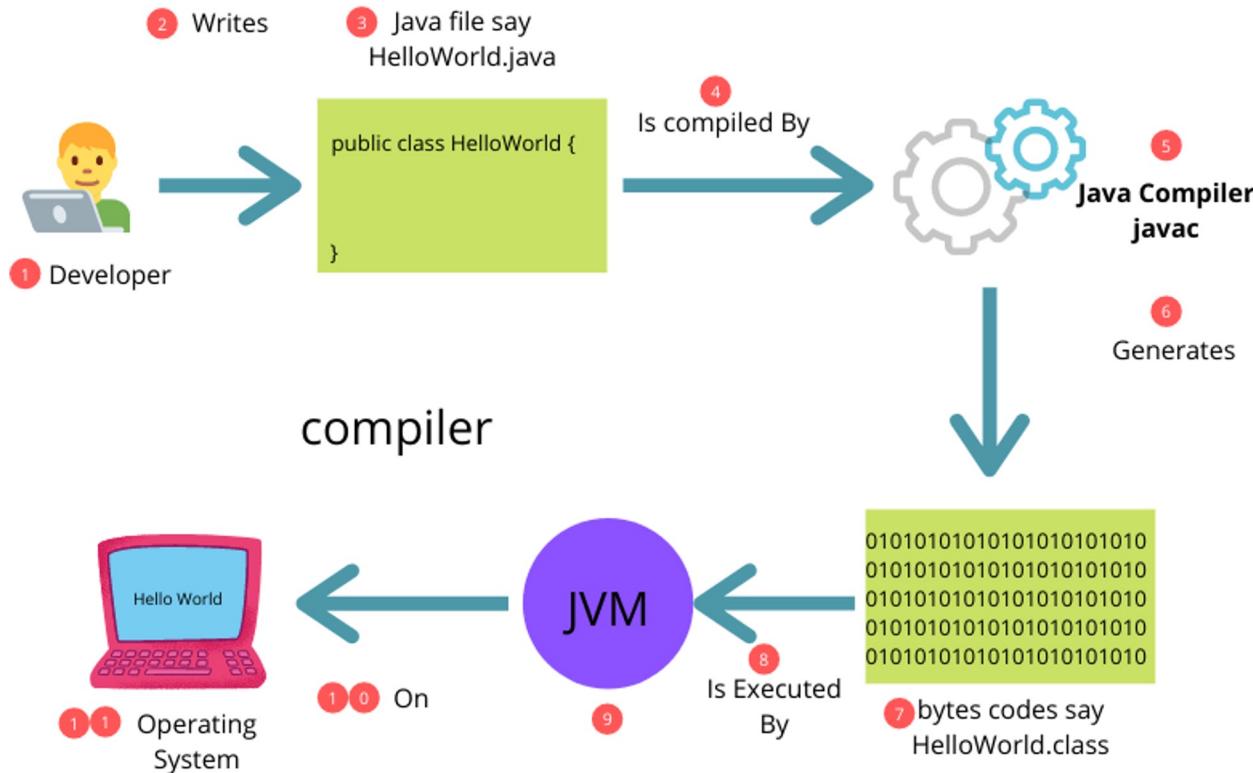
- ❖ What is Apache Tomcat?
- ❖ Install & Setup Apache Tomcat
- ❖ Build and deploy in Tomcat a simple web application

## Git

- ❖ What is Git?
- ❖ Install & Setup Git
- ❖ Create GitHub Account

# What is a Java application?

# This is a Java application



# Java

## Install & Setup

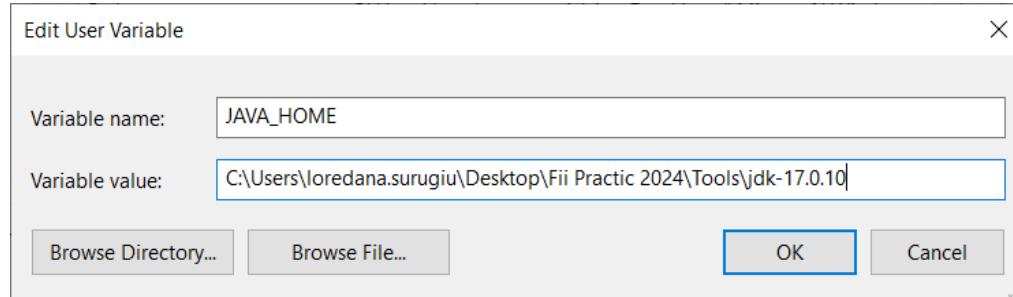
### Download

- ❖ JDK 17

<https://www.oracle.com/java/technologies/javase/jdk17-archive-downloads.html>

### Add environment variables

- ❖ Set JAVA\_HOME

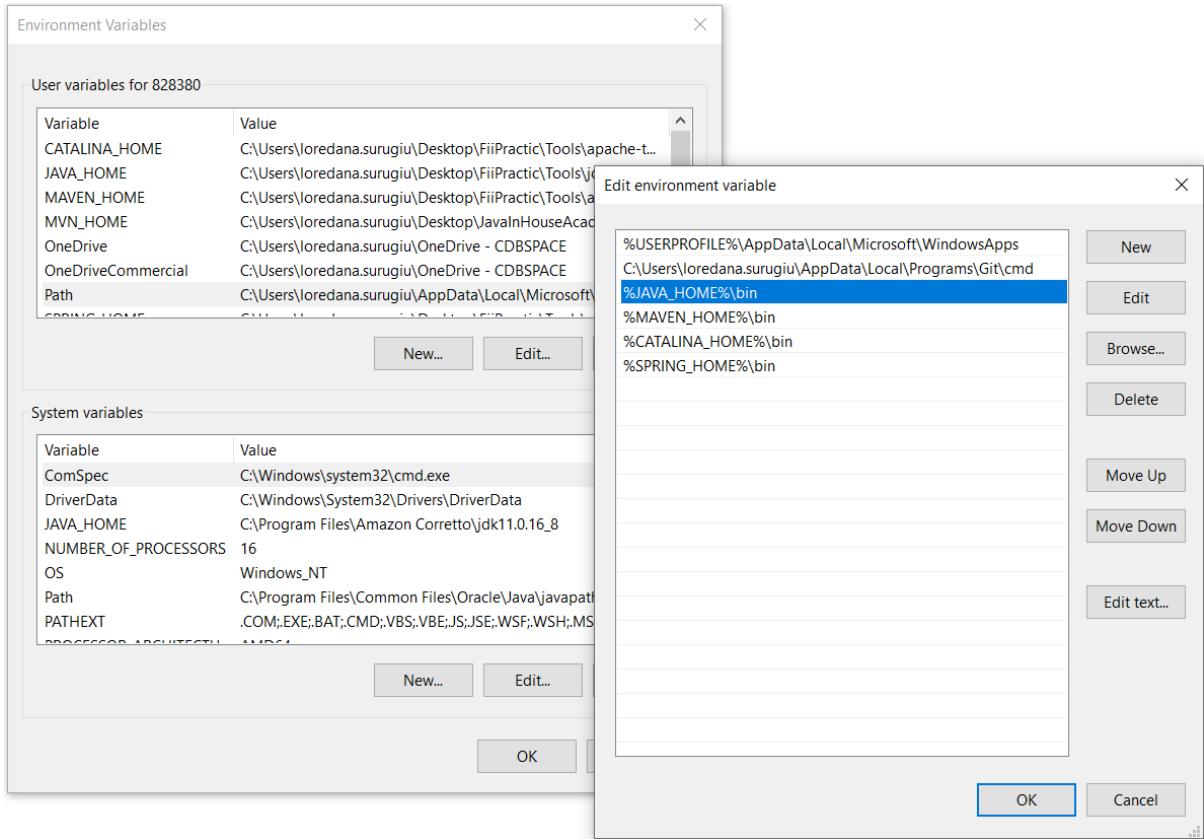


# Java

## Install & Setup

## Edit environment variable

## ❖ Setup PATH



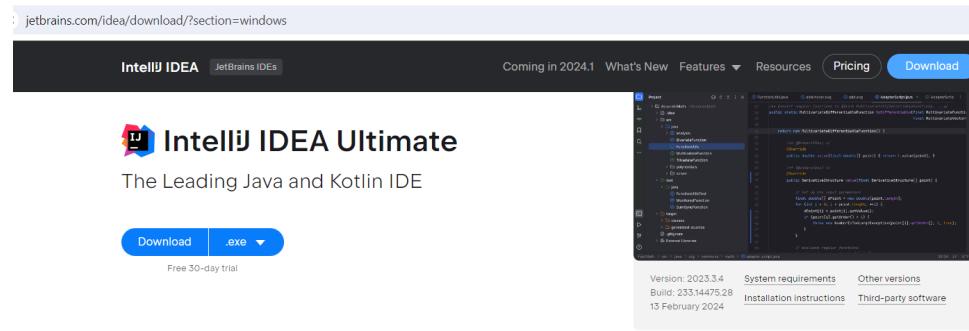
# Using IntelliJ Idea to create your first application

# Using IntelliJ Idea to create your first application

## Download

### ❖ Community Edition

<https://www.jetbrains.com/idea/download/?section=windows>



We're committed to giving back to our wonderful community, which is why IntelliJ IDEA Community Edition is completely free to use

### IntelliJ IDEA Community Edition

The IDE for Java and Kotlin enthusiasts

[Download](#) [.exe](#)

Free, built on open source

# What is Maven?

## What is Maven?

High level overview

**Maven = Build tool**

**Maven = Project  
management tool**

Manages dependencies

Produces an artifact

Handles versioning/releases

Favours convention over configuration

Apache Software Foundation

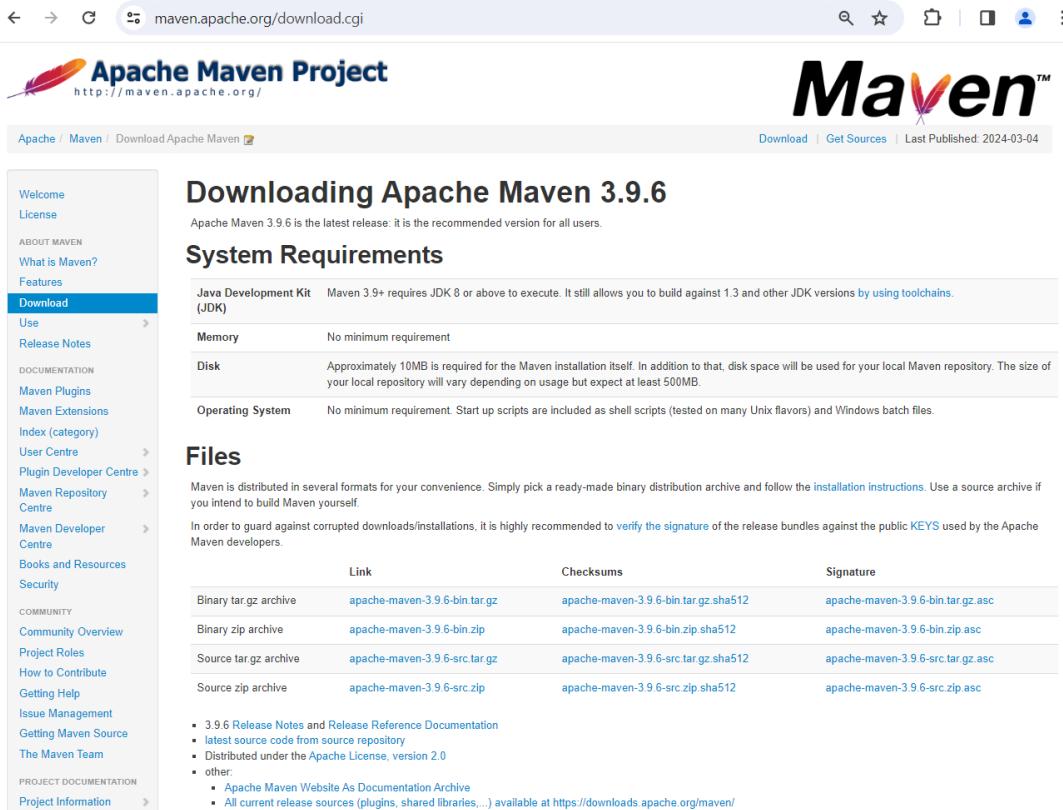
Open Source

# What is Maven?

## Install & Setup

### Download

- ❖ 3.9.6
- ❖ <https://maven.apache.org/download.cgi>
- ❖ Binary zip for Windows
- ❖ Binary tar for Unix



The screenshot shows the Apache Maven Project download page at [maven.apache.org/download.cgi](http://maven.apache.org/download.cgi). The page features the Apache logo and the large "Maven™" logo. The main content area is titled "Downloading Apache Maven 3.9.6". It includes sections for "System Requirements" (Java Development Kit, Memory, Disk, Operating System) and "Files" (formats: Binary tar.gz archive, Binary zip archive, Source tar.gz archive, Source zip archive). A sidebar on the left lists various Maven documentation and community links.

## Apache Maven Project

http://maven.apache.org/

Apache / Maven / Download Apache Maven

## Downloading Apache Maven 3.9.6

Apache Maven 3.9.6 is the latest release: it is the recommended version for all users.

### System Requirements

|                      |   |
|----------------------|---|
| Java Development Kit | Maven 3.9+ requires JDK 8 or above to execute. It still allows you to build against 1.3 and other JDK versions by using toolchains.   |
| (JDK)                |   |
| Memory               | No minimum requirement  |
| Disk                 | Approximately 10MB is required for the Maven installation itself. In addition to that, disk space will be used for your local Maven repository. The size of your local repository will vary depending on usage but expect at least 500MB. |
| Operating System     | No minimum requirement. Start up scripts are included as shell scripts (tested on many Unix flavors) and Windows batch files.   |

### Files

Maven is distributed in several formats for your convenience. Simply pick a ready-made binary distribution archive and follow the [installation instructions](#). Use a source archive if you intend to build Maven yourself.

In order to guard against corrupted downloads/installations, it is highly recommended to [verify the signature](#) of the release bundles against the public [KEYS](#) used by the Apache Maven developers.

| Link                  | Checksums                     | Signature                            |
|-----------------------|-------------------------------|--------------------------------------|
| Binary tar.gz archive | apache-maven-3.9.6-bin.tar.gz | apache-maven-3.9.6-bin.tar.gz.sha512 |
| Binary zip archive    | apache-maven-3.9.6-bin.zip    | apache-maven-3.9.6-bin.zip.sha512    |
| Source tar.gz archive | apache-maven-3.9.6-src.tar.gz | apache-maven-3.9.6-src.tar.gz.sha512 |
| Source zip archive    | apache-maven-3.9.6-src.zip    | apache-maven-3.9.6-src.zip.sha512    |

- 3.9.6 Release Notes and Release Reference Documentation
- latest source code from source repository
- Distributed under the Apache License, version 2.0
- other:
  - Apache Maven Website As Documentation Archive
  - All current release sources (plugins, shared libraries,...) available at <https://downloads.apache.org/maven/>

# What is Maven?

## Install & Setup

### Installation

Unzip it and put it under the C drive

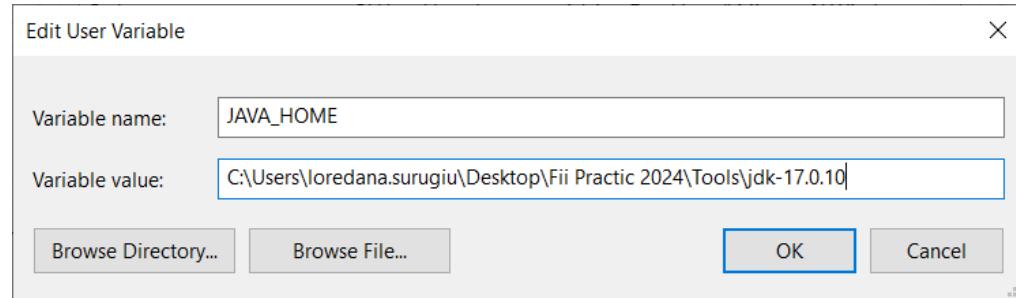
| C:\Users\loredana.surugiu\Desktop\FiiPractic2024\Tools\apache-maven-3.9.6 |                    |               |       |
|---|--------------------|---------------|-------|
| Name  | Date modified      | Type          | Size  |
| bin   | 11/28/2023 9:59 AM | File folder   |       |
| boot  | 11/28/2023 9:59 AM | File folder   |       |
| conf  | 11/28/2023 9:59 AM | File folder   |       |
| lib   | 11/28/2023 9:59 AM | File folder   |       |
| LICENSE   | 11/28/2023 9:59 AM | File          | 19 KB |
| NOTICE  | 11/28/2023 9:59 AM | File          | 5 KB  |
| README  | 11/28/2023 9:59 AM | Text Document | 3 KB  |

# What is Maven?

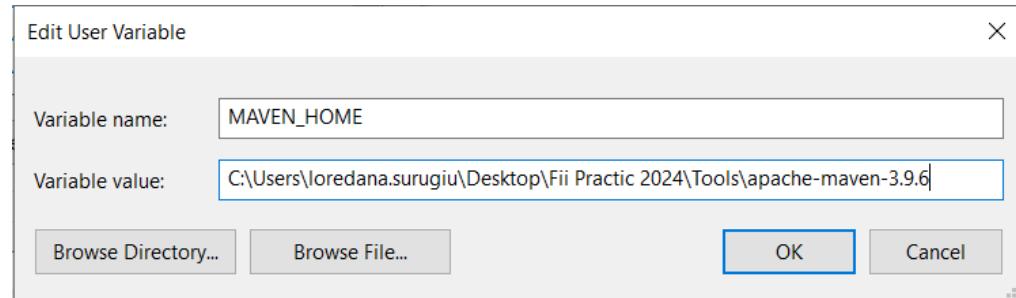
## Install & Setup

### Add environment variables

#### ❖ JAVA\_HOME



#### ❖ MAVEN\_HOME

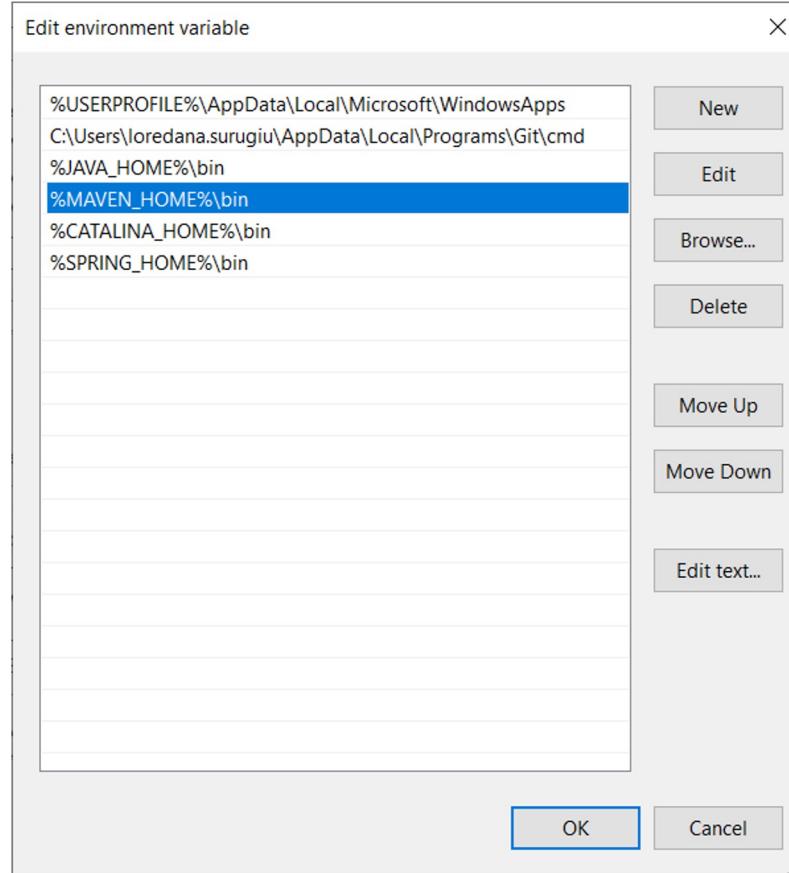


# What is Maven?

## Install & Setup

### Edit environment variable

#### ❖ Setup Path

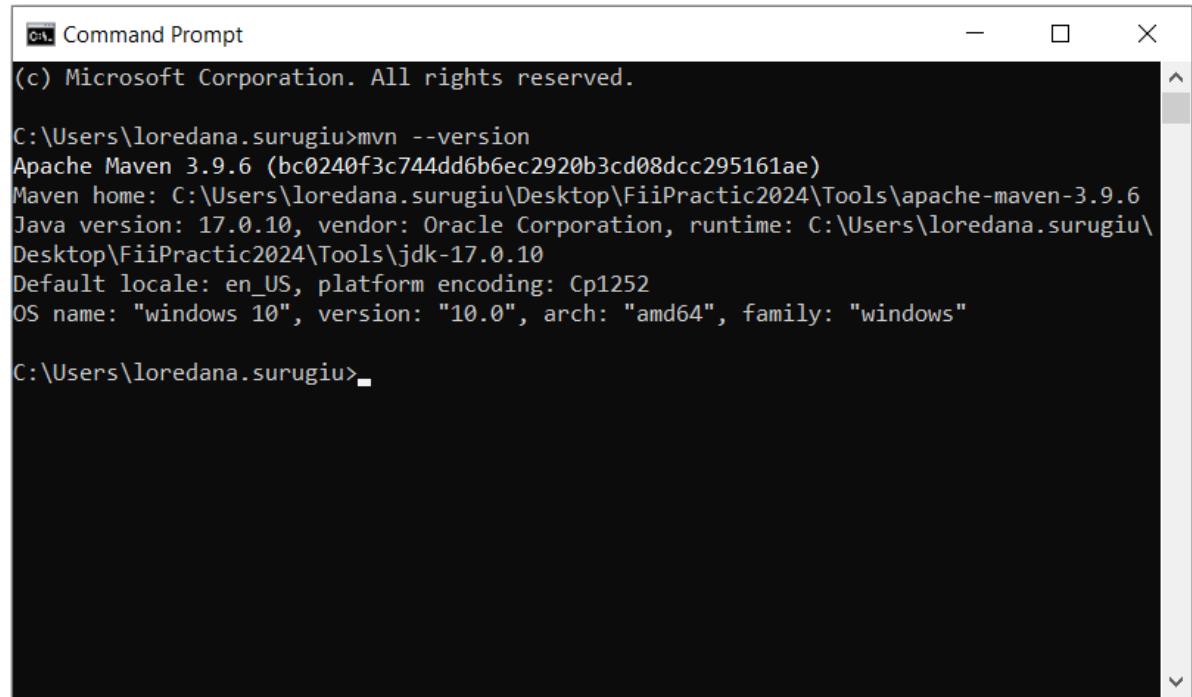


# What is Maven?

## Install & Setup

### Verify installation

- ❖ Open cmd
- ❖ Run mvn --version



The screenshot shows a Windows Command Prompt window titled "Command Prompt". The title bar includes standard window controls (minimize, maximize, close) and a scroll bar on the right side. The main area of the window displays the output of the "mvn --version" command. The output text is white on a black background. It includes copyright information, the Maven version (Apache Maven 3.9.6), the Maven home directory, Java version and vendor, the default locale, platform encoding, and the operating system name and version.

```
(c) Microsoft Corporation. All rights reserved.

C:\Users\loredana.surugiu>mvn --version
Apache Maven 3.9.6 (bc0240f3c744dd6b6ec2920b3cd08dcc295161ae)
Maven home: C:\Users\loredana.surugiu\Desktop\FiiPractic2024\Tools\apache-maven-3.9.6
Java version: 17.0.10, vendor: Oracle Corporation, runtime: C:\Users\loredana.surugiu\
Desktop\FiiPractic2024\Tools\jdk-17.0.10
Default locale: en_US, platform encoding: Cp1252
OS name: "windows 10", version: "10.0", arch: "amd64", family: "windows"

C:\Users\loredana.surugiu>
```

# What is Maven?

## Folder Structure



## What is Maven?

### Dependencies

## Maven POM

- ❖ POM - Project Object Model
- ❖ The `pom.xml` is XML document which describes a Maven Project
- ❖ Must comply with the `maven-4.0.0.xsd`  
XML Schema defining the 'rules' for the XML Document
- ❖ POMs can inherit properties from a parent POM
- ❖ "Effective POM" - is the POM complete with inherited properties

# What is Maven?

## Build Lifecycles

- ❖ Maven is based on the concept of build lifecycles
- ❖ A lifecycle is a pre-defined group of build steps called phases
- ❖ Each phase can be bound to one or more plugin goals
- ❖ Keep in mind all work done in Maven is done by plugins!
- ❖ Lifecycles and phases provide the framework to call plugin goals in a sequence

# What is Maven?

## Build Lifecycles

### Clean

- ❖ Does the clean of the project, removes all build artifacts from working directory
- ❖ Defined with plugin bindings

### Default

- ❖ Does the build, compiling, testing, deployment of our project
- ❖ Defined without plugin bindings, bindings are defined for each packaging

### Site

- ❖ Create the website for your project
- ❖ Least used in enterprise

# What is Maven?

## Build Lifecycles

### Phases

High level

**Validate** - Verify project is correct

**Compile** - Compile source code

**Test** - Test compiled source code

**Package** - Package compiled files to packaging

**Verify** - Run integration tests

**Install** - Install to local Maven Repository

**Deploy** - Deploy to shared Maven Repository

# What is Maven?

Plugins

clean:clean

compiler:compile

compiler:testCompile

surefire:test

jar:jar

install:install

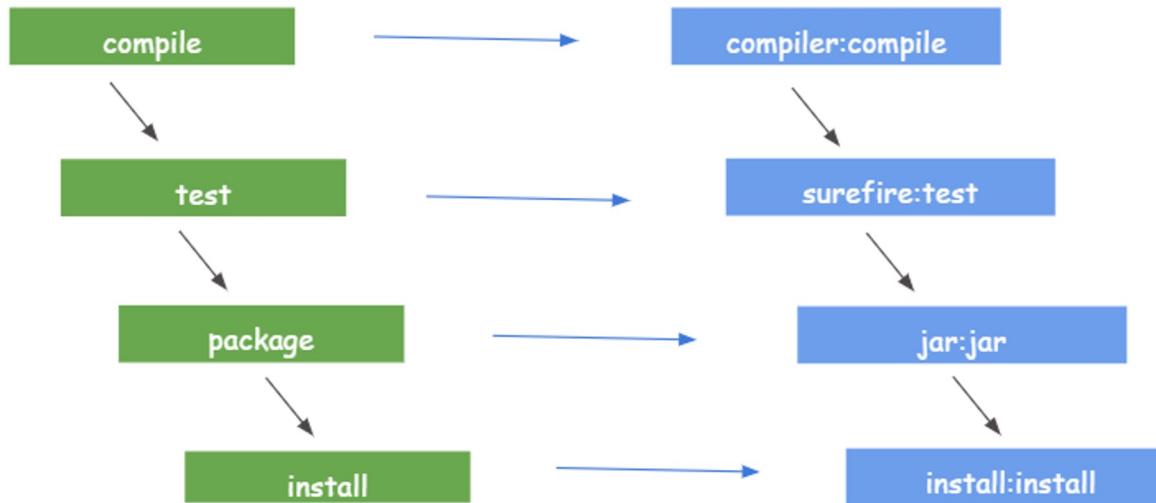
## Goals

pluginId:goalId

# What is Maven?

## Phases & Plugin Goals

`mvn install`



# What is Maven?

Plugins

Examples

Compiler plugin

Jar plugin

Javadoc plugin

# What is Maven?

Build section, defaults

## Build section in pom file

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

## Override defaults

E.g: <build>

```
<finalName> Payment</finalName>
```

```
</build>
```

# What is Maven?

Demo

## Create new simple Java Project

- Open IDE
- File → New Project →
  - Maven → JDK 17 →
    - Create from archetype ([maven-archetype-quickstart](#))
    - Configure name and artifact coordinates (GAV) → Next
    - Validate setup → Finish
- Run Maven goals from cmd:
  - mvn clean
  - mvn compile
  - mvn package
- Chain goals

# What is Maven?

## Dependencies

### GAV - Maven Coordinates

- ❖ are used to identify artifacts.
- ❖ Together, they identify a 'location' in a Maven Repository
  - **groupId** - Typically unique to an organization.  
Often the organization's reverse domain is used.
  - **artifactId** - typically the project name. A descriptor for the artifact.
  - **version** - refers to a specific version of the project.

# What is Maven?

Dependencies

## Versions

### SNAPSHOT

- important qualifier to Maven behaviour
- tells Maven that this is a development version
- not stable, and Maven should check for newer versions
- Maven first will check locally, then check remote repository (by default once per day)

### RELEASE

# What is Maven?

## Dependencies

**JAR** - Java ARchive - Zip file containing one or more Java class files.

## Packaging Types

**WAR** - Web Application aRchive - Zip file containing web application. Includes one or more JARs, Java class files and web resources.

**EAR** - Enterprise ARchive - Zip file containing one or more WAR files.

# What is Maven?

## Dependencies

**compile** - Default. Available on all classpaths of project. Also propagated to downstream projects.

**provided** - Like Compile, but expected to be provided by JDK or container at runtime.

## Scopes

**runtime** - Not required for compile, but needed for runtime. On runtime and test classpaths, not compile.

**test** - only available on test classpath, not transitive.

**system** - similar to provided, but JAR is added to system explicitly. (via file path)

**import** - Imports dependency of POM.

# What is Maven?

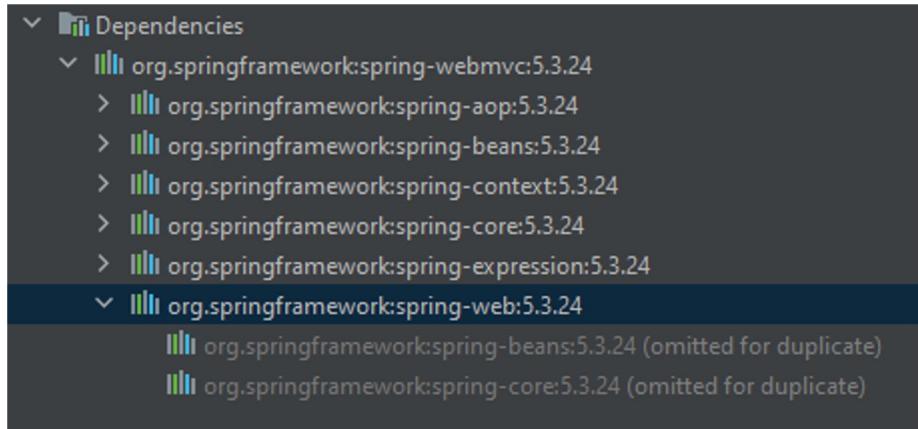
## Maven Dependencies

- ❖ **Dependency** - A dependency is an artifact which your maven project depends upon. Typically a jar or pom.
- ❖ **Transitive Dependencies** - A dependency of an artifact which your project depends on.
- ❖ **Dependency Management** - allows project authors to specify the versions of artifacts to be used.

# What is Maven?

## Dependencies

## Transitive dependencies



# What is Maven?

## Maven Repositories

- ❖ a location where project artifacts are stored.

### Types:

- **Local** - Repository on local file system - <user home>/.m2/.
- **Central** - Public repository hosted by Maven Community -  
<https://repo.maven.org/maven2/>
- **Remote** - Other locations - public or private (e.g. Oracle, Google Android)  
Private - hosted by companies for internal artifacts.

# What is Maven?

Repositories

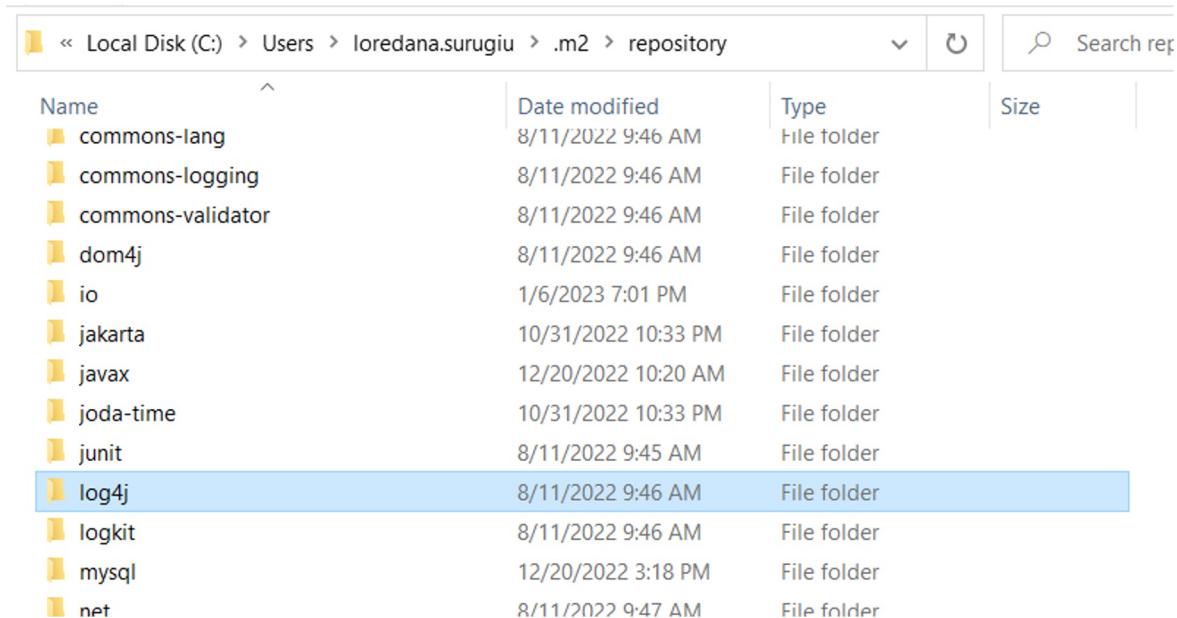


# What is Maven?

## Repositories

### Local repository

~/.m2/repository/<groupId>/  
<artifactId>/<version>



| Name              | Date modified       | Type        |
|-------------------|---------------------|-------------|
| commons-lang      | 8/11/2022 9:46 AM   | File folder |
| commons-logging   | 8/11/2022 9:46 AM   | File folder |
| commons-validator | 8/11/2022 9:46 AM   | File folder |
| dom4j             | 8/11/2022 9:46 AM   | File folder |
| io                | 1/6/2023 7:01 PM    | File folder |
| jakarta           | 10/31/2022 10:33 PM | File folder |
| javax             | 12/20/2022 10:20 AM | File folder |
| joda-time         | 10/31/2022 10:33 PM | File folder |
| junit             | 8/11/2022 9:45 AM   | File folder |
| log4j             | 8/11/2022 9:46 AM   | File folder |
| logkit            | 8/11/2022 9:46 AM   | File folder |
| mysql             | 12/20/2022 3:18 PM  | File folder |
| net               | 8/11/2022 9:47 AM   | File folder |

# What is Maven?

## Repositories

### Local repository

`~/.m2/repository/<groupId>/<artifactId>/<version>`

| ~/.m2/repository/log4j/log4j/1.2.12 |                    |                     |        |  |
|-------------------------------------|--------------------|---------------------|--------|--|
| Name                                | Date modified      | Type                | Size   |  |
| _remote.repositories                | 12/15/2020 2:02 PM | REPOSITORIES File   | 1 KB   |  |
| log4j-1.2.12                        | 12/15/2020 2:02 PM | Executable Jar File | 350 KB |  |
| log4j-1.2.12.jar.sha1               | 12/15/2020 2:02 PM | SHA1 File           | 1 KB   |  |
| log4j-1.2.12.pom                    | 8/6/2020 10:51 AM  | POM File            | 1 KB   |  |
| log4j-1.2.12.pom.lastUpdated        | 8/6/2020 10:51 AM  | LASTUPDATED File    | 1 KB   |  |
| log4j-1.2.12.pom.sha1               | 8/6/2020 10:51 AM  | SHA1 File           | 1 KB   |  |

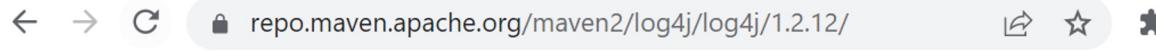
# What is Maven?

## Repositories

### Remote repository

repo.maven.apache.org/maven2

Multiple repos are allowed



## log4j/log4j/1.2.12

|   |                  |        |
|---|------------------|--------|
| <a href="#">..</a>                      |                  |        |
| <a href="#">log4j-1.2.12.jar</a>        | 2005-09-23 20:01 | 358085 |
| <a href="#">log4j-1.2.12.jar.md5</a>    | 2005-09-23 20:01 | 32     |
| <a href="#">log4j-1.2.12.jar.sha1</a>   | 2005-09-23 20:01 | 40     |
| <a href="#">log4j-1.2.12.pom</a>        | 2005-09-23 20:01 | 145    |
| <a href="#">log4j-1.2.12.pom.md5</a>    | 2005-09-23 20:01 | 128    |
| <a href="#">log4j-1.2.12.pom.sha1</a>   | 2005-09-23 20:01 | 136    |
| <a href="#">maven-metadata.xml</a>      | 2005-09-23 20:01 | 110    |
| <a href="#">maven-metadata.xml.md5</a>  | 2005-09-23 20:01 | 74     |
| <a href="#">maven-metadata.xml.sha1</a> | 2005-09-23 20:01 | 129    |

# What is Maven?

IDE integration

## Import as Maven project

- From existing sources
- From VCS

## Create as Maven project

- Archetypes = projects templates
- E.g. archetype: maven-archetype-webapp

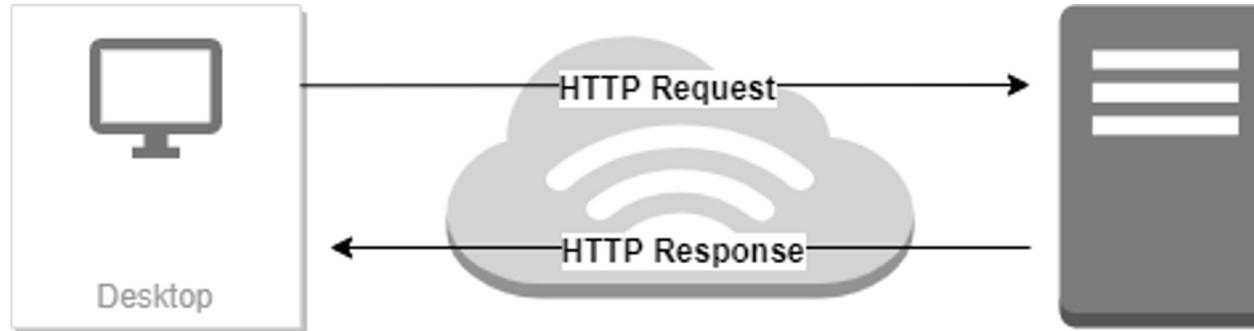
# What is Apache Tomcat?

# What is Apache Tomcat ?

Just a little bit about HTTP

## HTTP

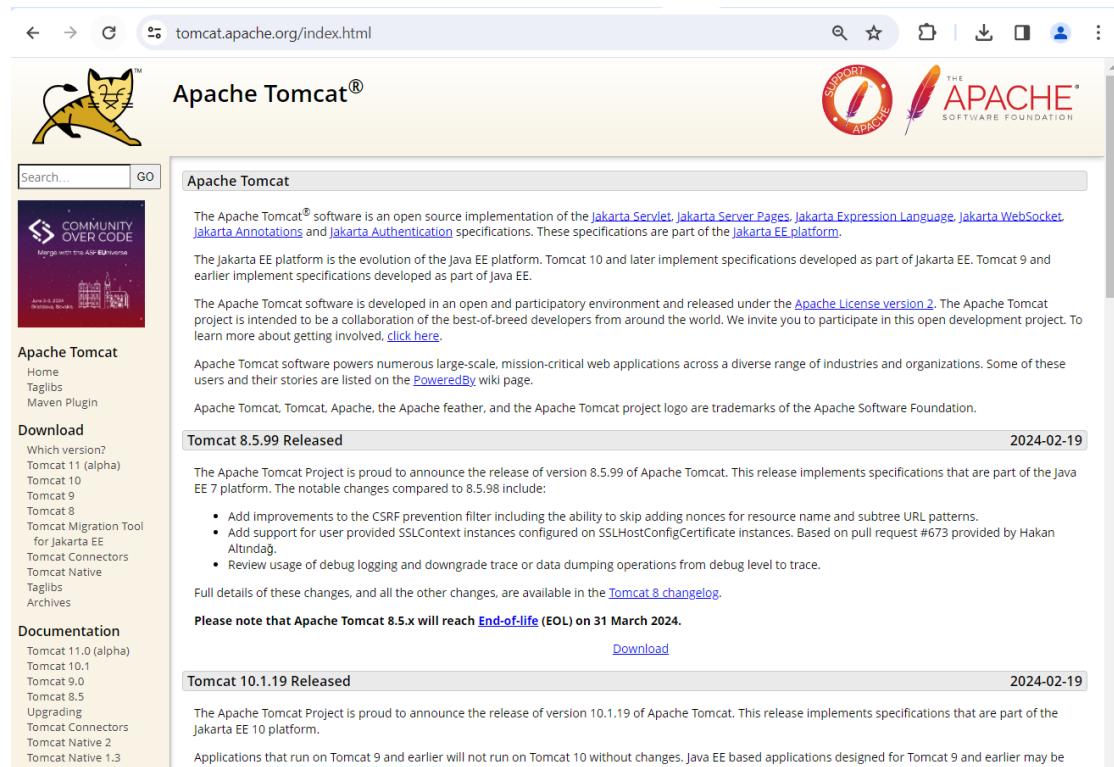
- ❖ Communication protocol between browser and web server
- ❖ Uses plain text



# What is Apache Tomcat ?

High level overview

- ❖ Web server
- ❖ Maintained by Apache
- ❖ Open source
- ❖ Implements Servlet Specification



The screenshot shows the Apache Tomcat homepage at [tomcat.apache.org/index.html](http://tomcat.apache.org/index.html). The page features a large yellow cat logo, a search bar, and the Apache Software Foundation logo. The main content area is titled "Apache Tomcat®" and discusses the software's implementation of Jakarta EE specifications and its role in the Java ecosystem. It highlights the release of Tomcat 8.5.99 and 10.1.19, providing links to download the software.

Apache Tomcat®

Apache Tomcat

Apache Tomcat

Apache Tomcat

Apache Tomcat

Tomcat 8.5.99 Released

Tomcat 10.1.19 Released

# What is Apache Tomcat ?

Set up

## Download

Tomcat 9 from Apache:

<https://tomcat.apache.org/download-90.cgi>

9.0.86

Please see the [README](#) file for packaging information. It explains what every distribution contains.

### Binary Distributions

- Core:
  - [zip \(pgp, sha512\)](#)
  - [tar.gz \(pgp, sha512\)](#)
  - [32-bit Windows zip \(pgp, sha512\)](#)
  - [64-bit Windows zip \(pgp, sha512\)](#)
  - [32-bit/64-bit Windows Service Installer \(pgp, sha512\)](#)
- Full documentation:
  - [tar.gz \(pgp, sha512\)](#)
- Deployer:
  - [zip \(pgp, sha512\)](#)
  - [tar.gz \(pgp, sha512\)](#)
- Embedded:
  - [tar.gz \(pgp, sha512\)](#)
  - [zip \(pgp, sha512\)](#)

# What is Apache Tomcat?

Set up

## Installation

Unzip it and put it under the C drive

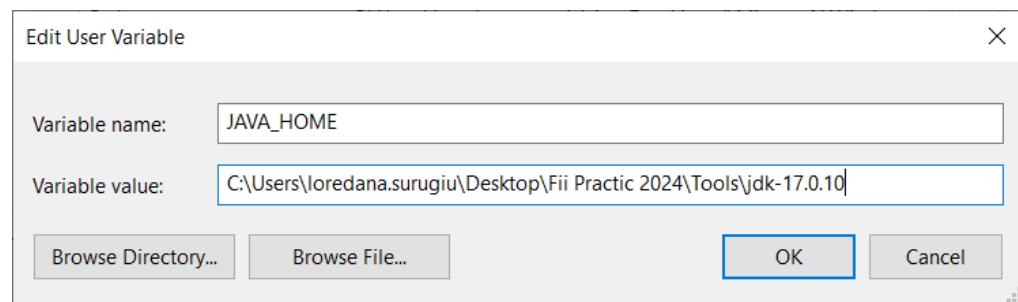
| Name            | Date modified     | Type          | Size  |
|-----------------|-------------------|---------------|-------|
| bin             | 2/14/2024 8:15 AM | File folder   |       |
| conf            | 2/24/2024 6:49 PM | File folder   |       |
| lib             | 2/14/2024 8:15 AM | File folder   |       |
| logs            | 2/24/2024 6:49 PM | File folder   |       |
| temp            | 2/14/2024 8:15 AM | File folder   |       |
| webapps         | 2/24/2024 6:49 PM | File folder   |       |
| work            | 2/24/2024 6:49 PM | File folder   |       |
| BUILDING        | 2/14/2024 8:15 AM | Text Document | 22 KB |
| CONTRIBUTING.md | 2/14/2024 8:15 AM | MD File       | 7 KB  |
| LICENSE         | 2/14/2024 8:15 AM | File          | 57 KB |
| NOTICE          | 2/14/2024 8:15 AM | File          | 3 KB  |
| README.md       | 2/14/2024 8:15 AM | MD File       | 4 KB  |
| RELEASE-NOTES   | 2/14/2024 8:15 AM | File          | 7 KB  |
| RUNNING         | 2/14/2024 8:15 AM | Text Document | 17 KB |

# What is Apache Tomcat?

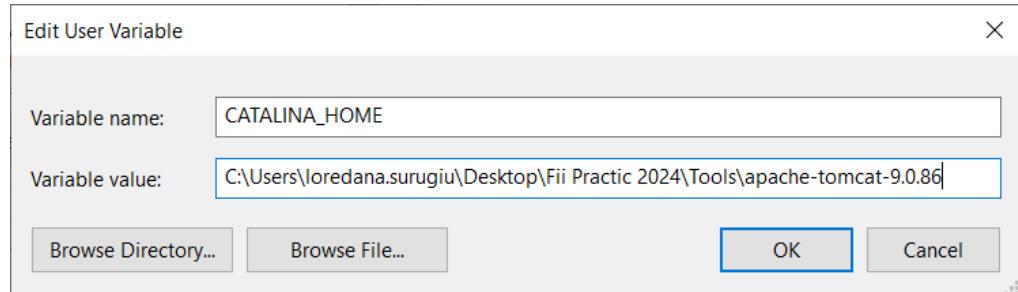
Set up

## Add environment variables

### ❖ JAVA\_HOME



### ❖ CATALINA\_HOME

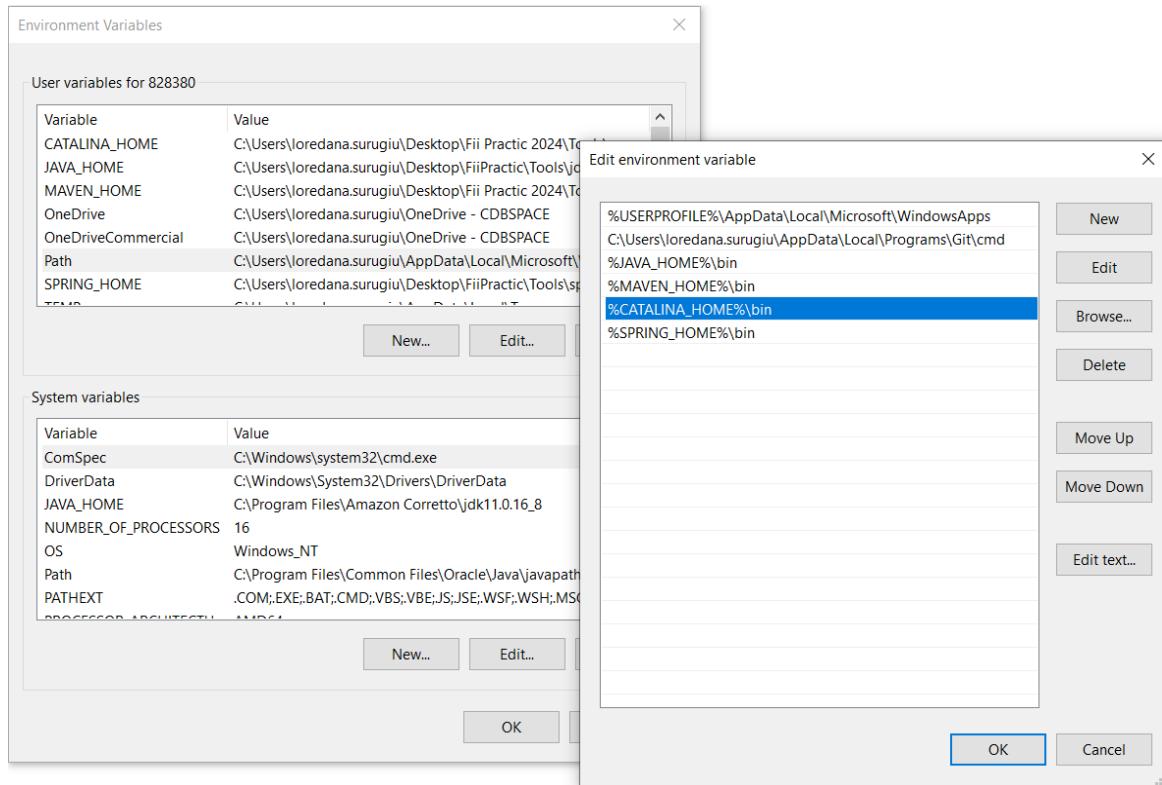


# What is Apache Tomcat?

## Set up

## Edit environment variable

## ❖ Setup Path



# What is Apache Tomcat?

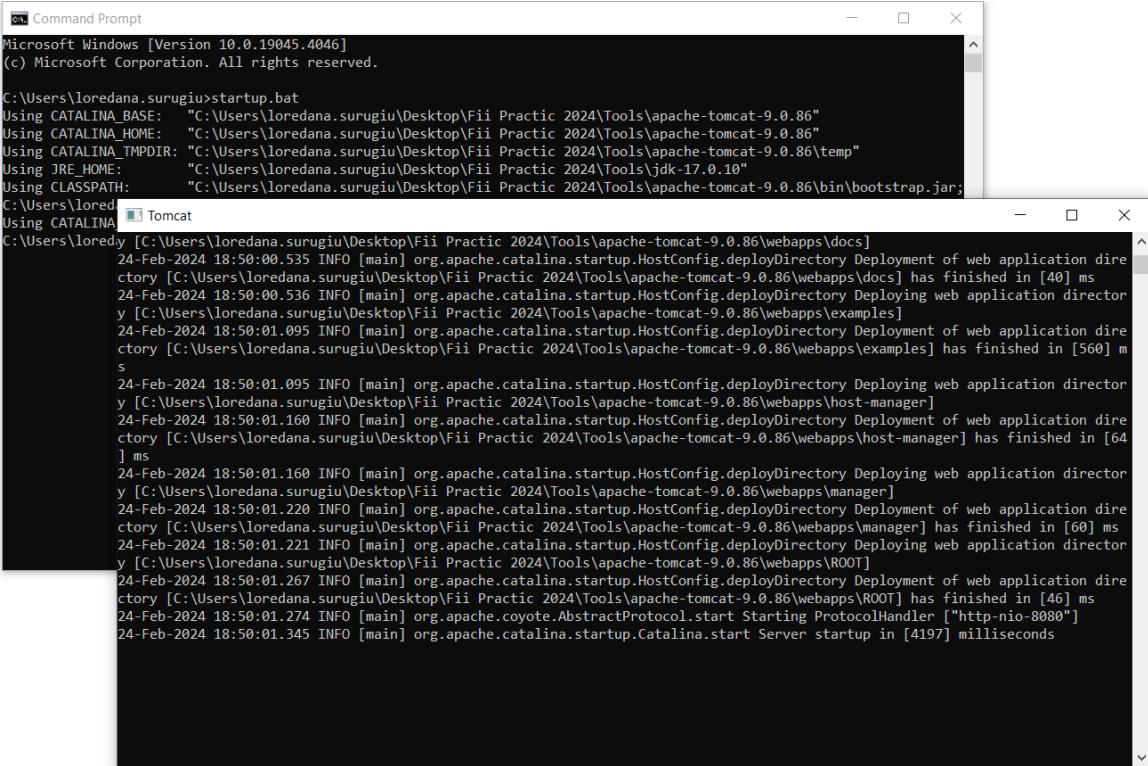
Set up

## Start Tomcat

- ❖ run **startup.bat**

## Stop Tomcat

- ❖ run **shutdown.bat**



The image shows two side-by-side Command Prompt windows on a Windows 10 desktop. Both windows have a title bar 'Command Prompt' and are running under Microsoft Windows [Version 10.0.19045.4046]. The left window shows the output of running 'startup.bat'. It includes environment variable settings like CATALINA\_HOME, CATALINA\_TMPDIR, JRE\_HOME, and CLASSPATH, followed by a series of deployment logs for the 'docs' and 'examples' web applications. The right window shows the output of running 'shutdown.bat', which includes deployment logs for the 'host-manager' and 'ROOT' web applications.

```
C:\Users\loredana.surugiu>startup.bat
Microsoft Windows [Version 10.0.19045.4046]
(c) Microsoft Corporation. All rights reserved.

C:\Users\loredana.surugiu>Using CATALINA_BASE: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86"
Using CATALINA_HOME: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86"
Using CATALINA_TMPDIR: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\temp"
Using JRE_HOME: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\jdk-17.0.10"
Using CLASSPATH: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\bin\bootstrap.jar;
C:\Users\loredana.surugiu>Using CATALINA_HOME: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86"
Using CATALINA_TMPDIR: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\temp"
Using JRE_HOME: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\jdk-17.0.10"
Using CLASSPATH: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\bin\bootstrap.jar;
C:\Users\loredana.surugiu>Using CATALINA_HOME: "C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\docs"
24-Feb-2024 18:50:00.535 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\docs] has finished in [40] ms
24-Feb-2024 18:50:00.536 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\examples]
24-Feb-2024 18:50:01.095 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\examples] has finished in [560] ms
24-Feb-2024 18:50:01.095 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\host-manager]
24-Feb-2024 18:50:01.160 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\host-manager] has finished in [64] ms
24-Feb-2024 18:50:01.160 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\manager]
24-Feb-2024 18:50:01.220 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\manager] has finished in [60] ms
24-Feb-2024 18:50:01.221 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\ROOT]
24-Feb-2024 18:50:01.267 INFO [main] org.apache.catalina.startup.HostConfig.deployDirectory Deployment of web application directory [C:\Users\loredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\webapps\ROOT] has finished in [46] ms
24-Feb-2024 18:50:01.274 INFO [main] org.apache.coyote.AbstractProtocol.start Starting ProtocolHandler ["http-nio-8080"]
24-Feb-2024 18:50:01.345 INFO [main] org.apache.catalina.startup.Catalina.start Server startup in [4197] milliseconds
```

# What is Apache Tomcat?

Set up

## Validate installation

- ❖ Open a browser
- ❖ Navigate to

localhost:8080

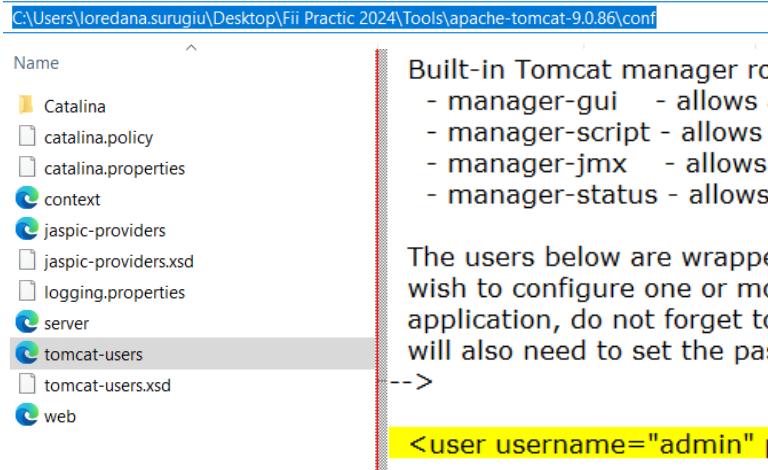
The screenshot shows the Apache Tomcat 9.0.86 welcome page. At the top, there is a navigation bar with links to Home, Documentation, Configuration, Examples, Wiki, and Mailing Lists. On the right, there is a "Find Help" link. Below the navigation bar, the text "Apache Tomcat/9.0.86" is displayed, along with the Apache Software Foundation logo. A green banner in the center says "If you're seeing this, you've successfully installed Tomcat. Congratulations!" To the left of the banner is a cartoon cat icon. To the right are three buttons: "Server Status", "Manager App", and "Host Manager". Below the banner, under "Recommended Reading", are links to "Security Considerations How-To", "Manager Application How-To", and "Clustering/Session Replication How-To". In the middle section, there is a "Developer Quick Start" area with links to "Tomcat Setup", "First Web Application", "Realms & AAA", "JDBC DataSources", "Examples", and "Servlet Specifications" and "Tomcat Versions". The bottom section is divided into three yellow boxes: "Managing Tomcat" (with links to Release Notes, Changelog, Migration Guide, and Security Notices), "Documentation" (with links to Tomcat 9.0 Documentation, Configuration, and Wiki), and "Getting Help" (with links to FAQ and Mailing Lists, and information about tomcat-announce, tomcat-users, taglibs-user, and tomcat-dev mailing lists).

# What is Apache Tomcat?

Set up

## Access Manager App

- ❖ Navigate to **apache-tomcat-9.0.86/conf** and open **tomcat-users** in Notepad
- ❖ Setup username and password and *manager-gui* role



C:\Users\oredana.surugiu\Desktop\Fii Practic 2024\Tools\apache-tomcat-9.0.86\conf

| Name                 |
|----------------------|
| Catalina             |
| catalina.policy      |
| catalina.properties  |
| context              |
| jaspic-providers     |
| jaspic-providers.xsd |
| logging.properties   |
| server               |
| <b>tomcat-users</b>  |
| tomcat-users.xsd     |
| web                  |

Built-in Tomcat manager roles:

- manager-gui - allows access to the HTML GUI and the status pages
- manager-script - allows access to the HTTP API and the status pages
- manager-jmx - allows access to the JMX proxy and the status pages
- manager-status - allows access to the status pages only

The users below are wrapped in a comment and are therefore ignored. If you wish to configure one or more of these users for use with the manager web application, do not forget to remove the <!... ...> that surrounds them. You will also need to set the passwords to something appropriate.

-->

```
<user username="admin" password="pass" roles="manager-gui"/>
```

# What is Apache Tomcat?

Basic application example

## Create new web app project

- Open IDE
- File → New Project →
  - Maven → JDK 17 →
    - Create from archetype ([maven-archetype-webapp](#))
    - Configure name and artifact coordinates (GAV) → Next
    - Validate setup → Finish

# What is Apache Tomcat?

Basic application example

## Configure web app

- Add the servlet dependency
- In pom.xml file go to <dependencies> and add javax.servlet-api
  - <dependency>  
    <groupId>javax.servlet</groupId>  
    <artifactId>javax.servlet-api</artifactId>  
    <version>4.0.1</version>  
  </dependency>
  - Maven → reload project
  - Override maven.compiler.source and maven.compiler.target to 17
  - Add a new Java class for Servlet (extends HttpServlet)
    - Override doGet method:  

```
response.getOutputStream().println("Hello from Fii Practic!");
```
    - Add WebServlet annotation  

```
@WebServlet("/hello")
```

# What is Apache Tomcat?

Basic application example

## Build web app

- ❖ mvn clean package

## Deploy web app

- ❖ Go to target
- ❖ Copy .war file to tomcat\webapps
- ❖ Start tomcat
- ❖ Check your app in browser at the URL
  - localhost:8080/\_warname\_/\_servletpath\_  
(e.g. <http://localhost:8080/FiiPractic/hello>)

# What is Git?

# What is Git?

What is ...

- a Version Control System (VCS) ?
- GIT?
- GitHub and how it relates to GIT?
- a branch?



# What is Git?

Repository interaction commands:

- Fetch
- Pull
- Push

Local commands:

- Status
- Checkout
- Merge
- Commit



# What is Git?

## Install & Setup

### Download

<https://git-scm.com/downloads>

### Create GitHub account

<https://github.com/>

The screenshot shows the official Git download page at [git-scm.com/downloads](https://git-scm.com/downloads). The page features the Git logo and the tagline "distributed-even-if-your-workflow-isn't". A search bar is at the top right. On the left, there's a sidebar with links for About, Documentation, Downloads (GUI Clients and Logos), and Community. A sidebar note mentions the availability of the Pro Git book on GitHub. The main content area has a large "Downloads" heading. It shows download links for macOS, Windows, and Linux/Unix, each accompanied by its respective operating system icon. A prominent callout for the latest source release (2.44.0) includes a "Release Notes" link and a "Download for Windows" button. Below the download section, there are sections for "GUI Clients" (with a link to view them) and "Logos" (with a link to view logos). At the bottom, there's a section for "Git via Git" with a command-line link and a note about browsing the repository interface.



# Thank You!