PROGRAMMING WITH JAVA (1/2) \sim Tutorial for Windows and Linux \sim

Baptiste Vergain¹ INFO0062 - Object Oriented Programming

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¹Greatly inspired by the work of former assistant, Jean-François Grailet. $\implies \forall \in \mathbb{R} \rightarrow \forall \in \mathbb{R$

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Introduction

This document provides key elements to get started with Java.

We will see how to *install* Java, and how to *compile* and *run* a Java program whether you have a Windows or a Linux Operating System (OS).

Note: To the best of my knowledge, the tutorial for Linux, should also somewhat work for MacOS.

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Installing Java (I)

The main goal of this course is to understand the concepts related to object oriented programming. For this, we use the language Java as a support.

No matter how you will program with Java, you will first have to install Java.

Indeed, Java programs run in virtual machines:

- They are not directly compiled into executables like C programs.
- Cf. Chapter 2, slides 31-32.

We will now see how to install a compiler (javac) and a virtual machine (java) all at once.

Installing Java³ (II)

What you want to install is the Java SE Developement Kit:

- SE = Standard Edition,
- Comes with both javac and java.

Since we do not focus on the thorough mastery of **Java**, we will not rely on the latest version, but on Java 8:

- Java 8 can be downloaded on Oracle's website, but an account creation is required.
- the latest version² of Java is downloadable here without an account.

You can then download the uncompressed installers, and install Java directly. Follow the steps normally, you do not have to do anything special here.



Linux users can also use the following commands to install Java:

- First check that you do not have Java already installed by issuing the following command: javac -version.
 If this command indicates that Command 'javac' is not found, proceed as follows
- run the command sudo apt update
- then, for Java 8, run the command sudo apt install openjdk-8-jdk
- or for the latest release, run sudo apt install default-jdk

Note: The following steps should work for the most common Linux distributions. If for some reason the commands above do not work, make sure to contact a teaching assistant to solve the problem.

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On Windows (I)

Under windows you actually need to perform one additional step:

- Command prompt is not initially aware of both javac and java,
- to fix this, you need to expand one environment variable of Windows,
- after updating it, both javac and java will be usable in command prompt.

Command Prompt

```
Microsoft Windows [Version 10.0.19044.2486]
(c) Microsoft Corporation. All rights reserved.
C:\Users\Eviv Bulgroz>javac -version
javac 18
C:\Users\Eviv Bulgroz>
```

On Windows (II)

First of all, you need to find the location of the executables needed to use Java:

- in this case, javac.exe and java.exe.
- it should be C:\Program Files\Java\jdk-<version>\bin
- but if not use Windows search function.

Once found, take note of the location:

	Name	Date modified	Type	Size	
	freetype.dll	02/04/2022 13:36	Application exten	538 KB	
Ŕ	instrument.dll	02/04/2022 13:36	Application exten	48 KB	
*	j2gss.dll	02/04/2022 13:36	Application exten	48 KB	
*	j2pcsc.dll	02/04/2022 13:36	Application exten	24 KB	
	j2pkcs11.dll	02/04/2022 13:36	Application exten	75 KB	
	🚳 jaas.dll	02/04/2022 13:36	Application exten	26 KB	
*	📧 jabswitch	02/04/2022 13:36	Application	42 KB	
	jaccessinspector	02/04/2022 13:36	Application	102 KB	
	jaccesswalker	02/04/2022 13:36	Application	67 KB	
	💷 jar	02/04/2022 13:36	Application	21 KB	
	💷 jarsigner	02/04/2022 13:36	Application	21 KB	
	🚳 java.dll	02/04/2022 13:36	Application exten	142 KB	
	🕌 java	02/04/2022 13:36	Application	51 KB	
	javaaccessbridge.dll	02/04/2022 13:36	Application exten	280 KB	
	📧 javac	02/04/2022 13:36	Application	21 KB	
	📧 javadoc	02/04/2022 13:36	Application	21 KB	
	🗟 javajpeg.dll	02/04/2022 13:36	Application exten	173 KB	
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On Windows (III)

Now, open the Windows utility for modifying environment variables.

Using the search function should work for Windows 7 and onward.



On Windows (IV)

System Properties	×
Computer Name Hardware Advanced System Protection Remote	
You must be logged on as an Administrator to make most of these changes Performance Visual effects, processor scheduling, memory usage, and vitual memory	3.
Settings	
Startup and Recovery System startup, system failure, and debugging information Settings	
Cencel Appl	>

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On Windows (**V**)

Select the variable called Path in the list of System Variables and click on Edit:

/ariable	Value
OneDrive	C:\Users\Eviv Bulgroz\OneDrive
Path	C:\Users\Eviv Bulgroz\AppData\Local\Microsoft\WindowsApps;C:\
ТЕМР	C:\Users\Eviv Bulgroz\AppData\Local\Temp
ĭMΡ	C:\Users\Eviv Bulgroz\AppData\Local\Temp
	New Edit Delete
tem variables	
tem variables /ariable	Value
tem variables /ariable ComSpec	Value C:\WINDOWS\system32\cmd.exe
tem variables fariable ComSpec DriverData	Value C:\WiNDOWS\system32\cmd.exe C:\WiNDOWS\system32\Driver)DriverData
tem variables /ariable ComSpec DriverData VUMBER_OF_PROCESSORS	Value ^ C:\WINDOWS\system32\cmd.exe C:\WIndows\System32\DriverData 12
tem variables 'ariable comSpec DriverData UUMBER_OF_PROCESSORS DS	Value C:\WINDOWS\system32\crmd.exe C:\WINdows\System32\DriverSDriverData 12 Windows_NT
tem variables ariable comSpec comSpec triverData JUMBER_OF_PROCESSORS JS ath	Value C:\WINDOWS\system32\cmd.exe C:\WIndows\System32\Driver\Driv
tem variables ariable comSpec invierData IUMBER_OF_PROCESSORS IS bth ATHEXT	Value C:\WINDOWS\system32\crmd.exe C:\WINDOWS\system32\Driver\DriverData 12 Windows,NT C:\WINDOWS\system32\CKWINDOWS\System32\With} C:\WINDOWS\System32\With] C:\UNDOWS\System32\With]
tem variables (ariable comSpec hriverData UUMBER_OF_PROCESSORS JS pth ATHEXT RCOCESSOR ARCHITECTURE	Value C:\WINDOWS\system32\crnd.exe C:\WINDOWS\system32\Drivers\DriverData 12 Windows_NT C:\WINDOWS\system32:C\WINDOWS:C\WINDOWS\System32:\WbCOM;EXE;BAT;CMD;VB5;VB5;JS;US5;WS5;WSF;MSH_MSC AMD64 V
tem variables fariable ComSpec DriverData UUMBER_OF_PROCESSORS DS Path PATHEXT PROCESSOR ARCHITECTURE	Value C:\WINDOWS\system32\cmd.exe C:\WINDOWS\system32\Driver\Driv

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On Windows (VI)

Finally, add a new entry to the variable **Path**, that corresponds to the location where the executables javac.exe and java.exe are:



Now the *Command Prompt* will also look in this directory, when trying to find an executable that matches the name javac or java.

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Conclusion

Now, Java should be correctly installed on your device, this ends the first part of the tutorial.

The following tutorial will guide you through compilation and execution of a simple Java program, and will get you ready for the first series of exercises.