**Instructions for installing and configuring Java SE JDK --- OCCC CS2163 Java**

This document provides you with the step-by-step instruction of installing Java SE JDK and the corresponding configurations. JDK stands for Java Development Kit. SE stands for standard edition. This document contains the following three parts devoting to Windows, Linux and Mac OS X, respectively.

* Part 1: Installing JDK 13 on Windows
* Part 2: Installing JDK 13 on Linux, and Ubuntu 14.04 is used as an example
* Part3: Installing JDK 13 on Mac OS X

**Before you start the installation process below, you need to follow the instructions on the links below and uninstall any older jave versions that have been installed in your computer.**

* <https://www.softwarehow.com/uninstall-programs-windows/> for uninstall programs on Windows
* <https://www.wikihow.com/Uninstall-Programs-on-Mac-Computers> for uninstall programs on Mac
* <https://vitux.com/how-to-uninstall-programs-from-your-ubuntu-system/> for uninstall programs on Ubuntu

**Part 1: Installing and configuring JDK on Windows**

**Step 1:** go to URL <https://www.oracle.com/technetwork/java/javase/downloads/jdk13-downloads-5672538.html>, and click “**Accept License Agreement**” radio button, then click the jdk file “[jdk-13.0.1\_windows-x64\_bin.exe](https://download.oracle.com/otn-pub/java/jdk/13.0.1+9/cec27d702aa74d5a8630c65ae61e4305/jdk-13.0.1_windows-x64_bin.exe)”, and start the download process. The number 13 in the file name is the major version, and the numeric number *x* after “13.0” in is the minor version of jdk. As of Jan 2020, the current minor version is 1, so you will see jdk-13.0.1 in the file name

You need to have a 64-bit Windows to install jdk 13. In your 64-bit windows system, folder ***C:\Program Files*** is the default place that stores 64-bit application including Java JDK. Mostly likely, your Windows is a 64-bit Windows nowadays. But **if you do have a 32-bit Windows,** then you need to download a 32-bit version of windows from an earlier jdk version such as jdk 8, and please contact me for detail.

To know whether you have a 32-bit or 64-bit Windows operating system, just open the “Windows Explorer”, and then right click item “Computer”, then select the “Properties” menu item, and then you will see whether it is 32-bit or 64-bit windows, in the “System type” item under the “System” column.

In this document, I assume you have a 64-bit Windows.

**Step 2:** to install JDK, just run the .exe file that you have downloaded to your local disk in step 1.

You can specify what folder to install JDK, and we just follow the default installation folder, and it will be a folder like this: ***C:\Program Files\Java\jdk-13.0.x***, where the number 13 means the major version and **x** means the minor version number. Notice that JRE (Java Runtime Environment) is part of JDK, thus JRE will also be installed during the JDK installation process, and JRE is installed under the same jdk folder mentioned above. After the installation, if prompted to register the software, you can choose register or skip.

**Step 3:** locate the source code src.zip and unzip it to a folder in your computer.

There is a file named ***“src.zip”*** in folder ***C:\Program Files\Java\jdk-13.0.x\lib\*** . Locate this file, and extract this zip file to a different folder other than the ***C:\Program Files\*** folder, and you can name this folder “javaSourceCode”, or choose another name you prefer.

How to unzip (extract) a zip file: right click the zip file and select the “Extract All…” menu item, and then you can specify a folder to extract to. After you extract it, you can find out that there are many subfolders in the extracted folder, and one of them is folder “java.base”. Click into this folder “java.base”, and you will see next level of subfolders with names such as folder “java”, “javax”, etc. We will study the classes in subfolders under “java”, such as “lang” (knows as java.lang) and “util” (known as java.util) in this course. Inside all these subfolders are the source code files of Java language, because Java is open-source!

Actually, this **Step 3** is not a required step for installing JDK. However, we put it here because in this Java course, we will keep examining the source code of the Java classes, and we use the source code of Java as a powerful tool for illustrating Java. We will be discussing the details of Java source code later in our lessons. For now, you just need to make sure this zip file has been extracted correctly into the folder you specify, and don’t forget the path and name of this extracted folder, since we will be back to check out the source code!

Step 4 and 5 below will set the Windows System Variable Path to point to ***C:\Program Files\Java\jdk-13.0.x\bin\*** directory, and you need to learn how to set it.

**Step 4:** set the system environmental variable Path, by following the actions below:

1. Open Windows Explore, right click “Computer”, select “Properties”, and click “Advanced system settings”, and then click the “Environmental Variables” button
2. In the “User variables” window or the “System Variable” window, if you don’t see a variable named Path, use the “New” button to create a system variable named Path, then move to next step; else, you already see a variable named Path, click the “edit” button for this variable to open the dialog box for Path variable. If there is an old java path variable already existing, you need to delete the old java path variable.
3. In the “Edit environmental variable” dialog window, click the New button to add a new value in to the environmental variable, which is the java JDK bin folder: ***C:\Program Files\Java\jdk-13.0.1\bin\ .***
4. However, do NOT attempt to type in this jdk bin path by yourself, and you should copy this path from the Windows Explorer address bar, and then paste the path value here. Do NOT trust anybody’s typing, not even that of yourself. In many occasions, people get stuck here because they try to type in this long path, and inevitably, they have typos. To copy the bin folder path from the Windows Explorer, you need to open a Windows Explorer, and the browse to the bin folder, and then left click the address bar of the Windows Explorer, then the entire path will be selected and displayed in the address bar, and then you need to right click the selected path value ***C:\Program Files\Java\jdk-13.0.1\bin*** , and then paste it into the path value of the “Edit environmental variable” dialog window.
5. By clicking the “ok” button of the dialog box of the Path variable, you close the dialog box for setting the Path variable, and then click the “ok” button to close the “Environment variables” box, and click the “ok” button again to close the “Advanced system settings” dialog box. Finally you close the window that contains “Advanced system settings” item. Now you are done with setting the java JDK bin folder into the windows Path system variable.

**Step 5:** test the Path setting to make sure it has been correctly set

1. Open a command line terminal. When you click the Windows Search icon, which is right next to the Windows start button, and then type in cmd in the search box, the “Command Prompt” program will show up, and then click this “Command Prompt” to start the terminal command prompt. If you already have a windows command line terminal open up before you set the Path variable in step 4 above, you need to close the old terminal and open a new terminal prompt.
2. In the terminal, type in these two commands: “javac -version”, and “java -version” without the double quotation marks, then you should see the outputs as indicated by Figure 1 as below (notice that there is a space in front of the dash sign - in these two commands).

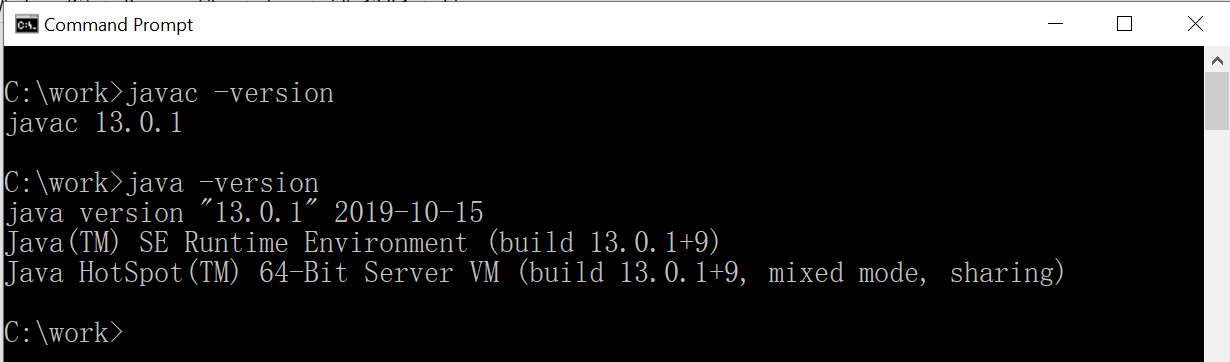


Figure 1: Verification of correctly setting the Path system variable

Notice that the jdk version is 13.0.1.

The two commands: ***javac*** and ***java***, are locating in the JDK bin directory that has been set into the Path system environmental variable, and that is the reason why the terminal can locate these two javac and java commands, no matter what current directory you are in. You can verify the existence of these two application files, ***javac*** and ***java***, in the ***C:\Program Files\Java\jdk-13.0.1\bin\*** directory.

If any of the results does not show up as indicated by the picture above, something must be wrong, and you need to go back to Step 3 to double check whether the Path variable has been set up correctly or not.

**!!!Done with Part 1: installing and configuring Java on Windows.**

**Part 2: Installing JDK on Linux (use Ubuntu Linux as an example)**

**Step 1:** go to URL: <https://www.oracle.com/technetwork/java/javase/downloads/jdk13-downloads-5672538.html> and then select either the deb package for Debian systems such as Ubuntu, or rpm package for Redhat systems such as Fedora. So it is either “[jdk-13.0.1\_linux-x64\_bin.deb](https://download.oracle.com/otn-pub/java/jdk/13.0.1+9/cec27d702aa74d5a8630c65ae61e4305/jdk-13.0.1_linux-x64_bin.deb)” or “[jdk-13.0.1\_linux-x64\_bin.rpm](https://download.oracle.com/otn-pub/java/jdk/13.0.1+9/cec27d702aa74d5a8630c65ae61e4305/jdk-13.0.1_linux-x64_bin.rpm)”, or just the zip file “[jdk-13.0.1\_linux-x64\_bin.tar.gz](https://download.oracle.com/otn-pub/java/jdk/13.0.1+9/cec27d702aa74d5a8630c65ae61e4305/jdk-13.0.1_linux-x64_bin.tar.gz)”. The numeric number *x* after 13.0. is the minor version of jdk, and currently x is 1.

How do I know what kind of Linux is installed in my computer? In Linux command line, type in command:

uname -a

, and if “i686” is shown, then it is a 32-bit Linux; if “x86-64” is shown, then it is a 64-bit Linux. If you have a 32 bit Linux, you need to install a 32-bit java such as jdk 8, and please contact me on how to install it.

**Step 2:** run the bin file that you have downloaded, in order to install the JDK by typing the commands below.

In the command prompt terminal, go to the this folder ***/home/username/Downloads*** (username should be replaced by your login name), and then run these two commands

**chmod 855 jdk-13.0.x\_linux-x64\_bin.tar.gz**

**tar zxvf jdk-13.0.x\_linux-x64\_bin.tar.gz**

The above two commands will execute the download file and self-extract the file as the JDK folder in the current Downloads folder, thus you will see a folder named ***jdk-13.0.x***, and this is the JDK folder.

Then execute this command to move this JDK folder into ***/usr/local***,

sudo mv /home/username/Downloads/***jdk-13.0.x***/ /usr/local/

, and you need to replace the username above with your username you used to log into Linux.

**Step 3:** set the system environmental variable: PATH by typing in the commands below:

sudo -i

echo "export PATH=$PATH:/usr/local/***jdk-13.0.x***/bin" >> /etc/profile

exit

The above command will set the bin folder of the JDK into the file /etc/profile , and you can verify this by opening this file /etc/profile. **Restart Ubuntu to activate this PATH setting**.

**Step 4:** test the PATH setting to make sure it has been correctly set by following the instructions below:

1. Open a command line terminal.
2. In the terminal, type in these two commands: “javac -version”, and “java -version” , then you should see outputs similar to Figure 1 in page 2.

**Step 5:** locate the source code src.zip and unzip it to a folder in your computer.

There is a file named ***“src.zip”*** in the JDK folder, e.g., ***/usr/local/jdk13.0.x*** , then extract this zip file to a folder, and you can name this folder “javaSourceCode”, or choose another name you prefer. The command is as below:

sudo unzip /usr/local/jdk-13.0.x/lib/src.zip –d /usr/local/jdk-13.0.x/javaSourceCode

After you extract it, you can find out that there are several subfolders in the extracted folder, such as folder “java”, “javax”, etc. Inside these subfolders are the source code files of Java language, because Java is open-source!

The **Step 5 above** is not required for installing JDK. However, we put it here because in this CS2163 Java course, we will keep checking out the source code of the Java classes, and we use the source code of Java as a powerful tool for illustrating Java. We will be discussing the details of Java source code later in our lessons. For now, you just need to make sure this zip file has been extracted correctly into the folder you specify, and don’t forget the name of this extracted folder, since we will be back to check out the source code!

If you use a Linux distro other than Ubuntu, the process is similar. If you do encounter problem during installation, you can come to me for help.

**!!!Done with installing and configuring Java on Linux (Ubuntu).**

**Part 3: Installing JDK on MAC OS X**

**Step 1:** go to URL: <https://www.oracle.com/technetwork/java/javase/downloads/jdk13-downloads-5672538.html>, and download file named “[dk-13.0.1\_osx-x64\_bin.dmg](https://download.oracle.com/otn-pub/java/jdk/13.0.1+9/cec27d702aa74d5a8630c65ae61e4305/jdk-13.0.1_osx-x64_bin.dmg)”, where the first appearance of letter x after string “13.0.” is the minor version of java. After download this file, just click and run this file to install. After installation, the PATH parameter will be set automatically.

If you have already installed java, you need to use the “**Software Update**” feature (available on the Apple menu on the upper left corner of Mac OS X) to verify that you have the up-to-date version of jdk for your Mac OS X. If you don’t, it will prompt you to update to the latest Java, then you just click “yes” and Java will be updated for you. After the software update, the PATH parameter will be setup automatically in Mac OS X.

**Step 2:** **Setting of preferred Java version** if you have older version installed

Go to /Applications/Utilities/, and then run the “Java Preferences” application, and you will see a pop-up window. Select the “General” tap and you will see different versions of Java listed. Use mouse to select the Java version that you prefer to the top of the list, and you should choose either ***Java SE x - 64 bit CPU*** or ***Java SE x - 32 bit CPU***, where x is the minor version. So that you switch between different Java versions. Similar to Linux (OS X kernel is a UNIX kernel), type in ***uname –a*** in a command line to get the information of whether your OS X is a 32 bit or 64 bit OS, and if the output has “i386”, then it is a 32 bit; if the output has “x86\_64”, then it is a 64 bit OS.

**Step 3:** test the PATH setting to make sure it has been correctly set

1. Open a command line terminal by invoking /Applications/Utilities/Terminal.app
2. In the terminal, type in these two commands: “javac -version”, and “java -version” , then you should see the outputs as indicated by a picture similar to Figure 1 in page 2 of this document.

**Step 4:** locate the source code src.zip and extract it to a folder in your computer.

For jdk 13, refer to Question 1 at the end of this page to locate the java source code src.zip. After unzip it, you will see a folder name **src** has been created, and in this **src** folder, you can see there are several subfolders in the extracted folder, such as folder “java”, “javax”, etc. Inside these subfolders are the source code files of Java, because Java is open-source!

The **Step 4 above** is not necessary for installing JDK. However, we put it here because in this CS2163 Java course, we will keep referring to the source code of the Java classes, and we use the source code of Java as a powerful tool for illustrating Java. We will be discussing the details of Java source code later in our lessons. For now, you just need to make sure this jar file has been extracted correctly into the folder you specify, and don’t forget the name of this extracted folder, since we will be back to check out the source code!

For the sake of simplicity, you can move the extracted src folder to a folder which is easier to access, such as /Users/yourUserName/ , with this command:

***cp –r src /Users/yourUserName***

***Question 1:*** *where is Java jdk 13 installed on Mac OS X ?*

**Answer:** ***/Library/Java/JavaVirtualMachines/jdk-13.0.x.jdk/contents/Home*** , where x is the minor version. In this folder, the bin sub-directory is the JDK folder with all the javac and java commands. Jdk 13 provides the src.zip, so you can unzip this zip file by using command line: ***sudo unzip ./src.zip –d ./javaSRC***

**!!! Done with installing and configuring Java on Mac OS X.**

**How to get help during installation: If you have problem with installing JDK or setting the PATH system variable on any of the platforms, either it is Windows, Linux, or Mac OS X,** you can bring your computer to my office during office hour. The school computers in the classroom and in the Student Computer Center lab are windows platform with the JDK path set, you don’t need to make any change on them.