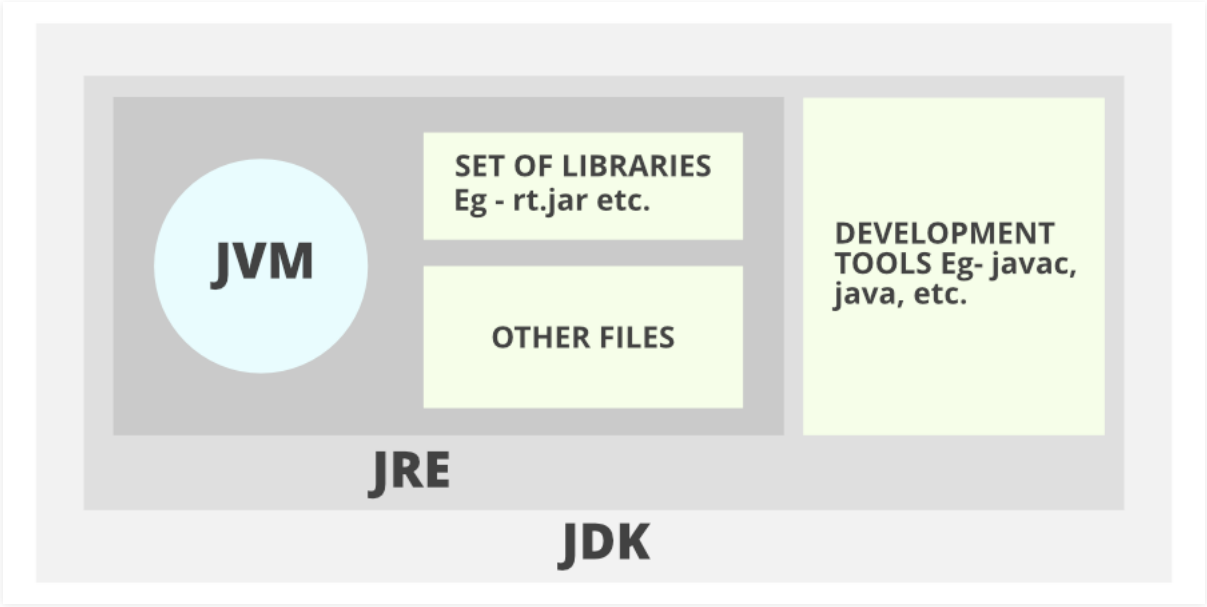
Setting up the environment in Java

Difficulty Level : Basic Last Updated : 04 Jan, 2022

Java is a general-purpose computer programming language that is concurrent, class-based, object-oriented, etc. Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of computer architecture. The latest version is **Java 17**. Below are the environment settings for both Linux and Windows. JVM, JRE, and JDK three are all platform-dependent because the configuration of each Operating System is different. But, Java is platform-independent. Few things must be clear before setting up the environment which can better be perceived from the below image provided as follows:



- **JDK**(Java Development Kit): JDK is intended for software developers and includes development tools such as the Java compiler, Javadoc, Jar, and a debugger.
- **JRE**(Java Runtime Environment): JRE contains the parts of the Java libraries required to run Java programs and is intended for end-users. JRE can be view as a subset of JDK.
- **JVM:** JVM (Java Virtual Machine) is an abstract machine. It is a specification that provides a runtime environment in which java bytecode can be executed. JVMs are available for many hardware and software platforms.

Now let us discuss the steps for setting up a Java environment with visual aids. Let be operating system be windows to illustrate visual aids.

Steps: Here we will be proposing steps for three different operating systems as listed:

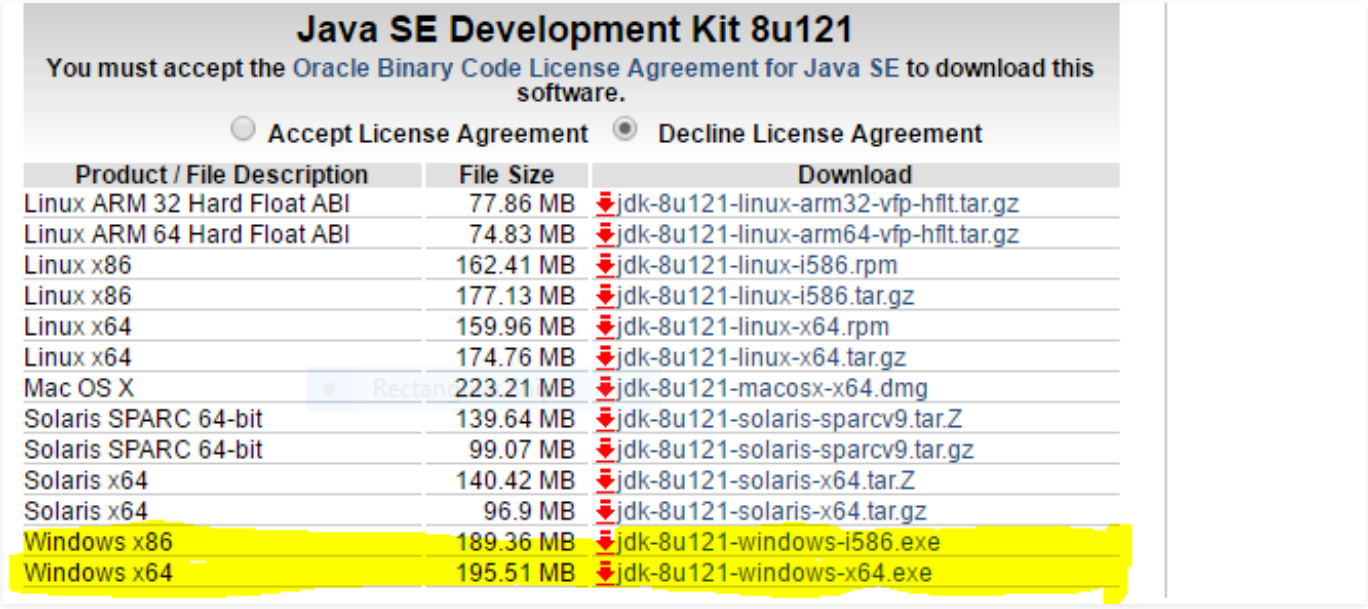
1. Windows operating system
2. Linux operating system

3. macOS operating system

A. Windows operating systems

Steps for setting the environment in Windows operation system are as follows:

Step 1: Java8 JDK is available at Download Java 8. Click the second last link for Windows(32 bit) and the last link for Windows(64 bit) as highlighted below.



Java SE Development Kit 8u121

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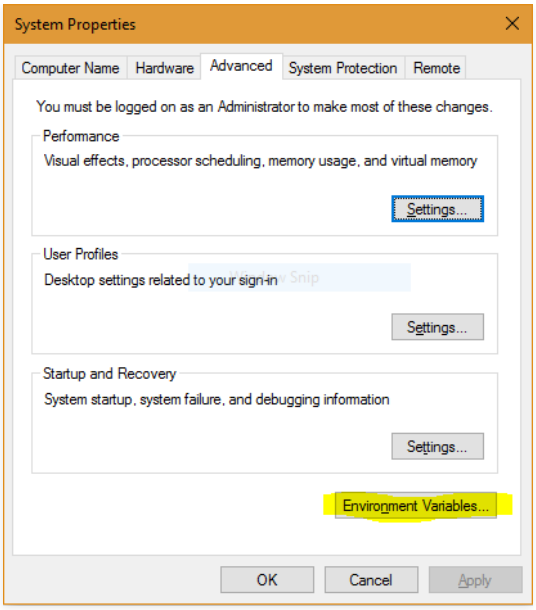
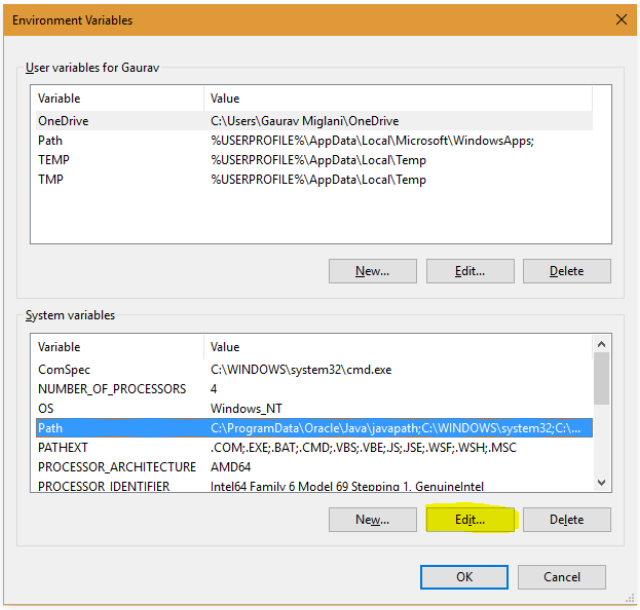
Product / File Description	File Size	Download
Linux ARM 32 Hard Float ABI	77.86 MB	jdk-8u121-linux-arm32-vfp-hflt.tar.gz
Linux ARM 64 Hard Float ABI	74.83 MB	jdk-8u121-linux-arm64-vfp-hflt.tar.gz
Linux x86	162.41 MB	jdk-8u121-linux-i586.rpm
Linux x86	177.13 MB	jdk-8u121-linux-i586.tar.gz
Linux x64	159.96 MB	jdk-8u121-linux-x64.rpm
Linux x64	174.76 MB	jdk-8u121-linux-x64.tar.gz
Mac OS X	223.21 MB	jdk-8u121-macosx-x64.dmg
Solaris SPARC 64-bit	139.64 MB	jdk-8u121-solaris-sparcv9.tar.Z
Solaris SPARC 64-bit	99.07 MB	jdk-8u121-solaris-sparcv9.tar.gz
Solaris x64	140.42 MB	jdk-8u121-solaris-x64.tar.Z
Solaris x64	96.9 MB	jdk-8u121-solaris-x64.tar.gz
Windows x86	189.36 MB	jdk-8u121-windows-i586.exe
Windows x64	195.51 MB	jdk-8u121-windows-x64.exe

Step 2: After download, run the *.exe* file and follow the instructions to install Java on your machine. Once you installed Java on your machine, you have to set up the environment variable.

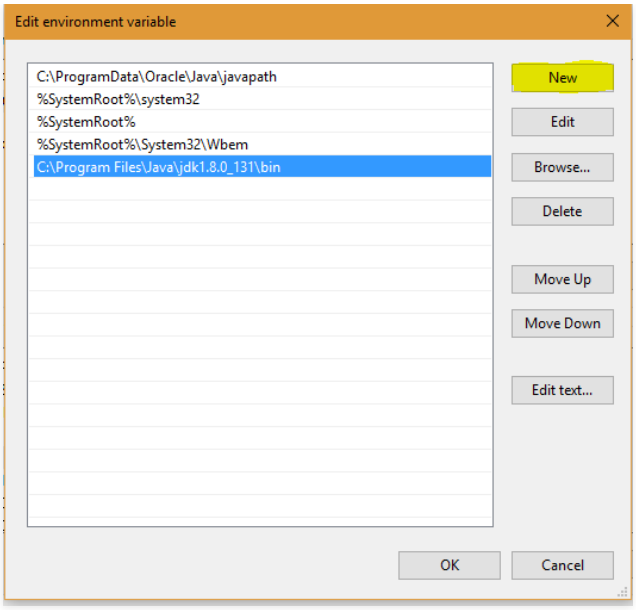
Step 3: Go to **Control Panel -> System and Security -> System.** Under the Advanced System Setting option click on **Environment Variables** as highlighted below.



Step 4: Now, you have to alter the “Path” variable under System variables so that it also contains the path to the Java environment. Select the “Path” variable and click on the Edit button as highlighted below.



Step 5: You will see a list of different paths, click on the New button, and then add the path where java is installed. By default, java is installed in “C:\Program Files\Java\jdk\bin” folder OR “C:\Program Files(x86)\Java\jdk\bin”. In case, you have installed java at any other location, then add that path.



Step 6: Click on OK, Save the settings, and you are done !! Now to check whether the installation is done correctly, open the command prompt and type *javac -version*. You will see that java is running on your machine.

> ***Note:*** *To make sure whether the compiler is set up, type javac in the command prompt. You will see a list related to javac.*

B. Linux Operating System

In Linux, there are several ways to install java. But we will refer to the simplest and easy way to install java using a terminal. For Linux, we will install OpenJDK. OpenJDK is a free and open-source implementation of the Java programming language. Steps for setting the environment in the Linux operation system are as follows:

Step 1: Go to **Application -> Accessories -> Terminal**.

Step 2: Type command as below as follows:

```
sudo apt-get install openjdk-8-jdk
```

Step 3: For the “JAVA_HOME” (Environment Variable) type command as shown below, in “Terminal” using your installation path…(Note: the default path is as shown, but if you have to install OpenJDK at another location then set that path.)

```
export JAVA_HOME = /usr/lib/jvm/java-8-openjdk
```

Step 4: For “PATH” (Environment Value) type command as shown below, in “Terminal” using your installation path…Note: the default path is as shown, but if you have to install OpenJDK at another location then set that path.)

```
export PATH = $PATH:/usr/lib/jvm/java-8-openjdk/bin
```

Note: We are done setting up the environment in Java for Linux OS.

> ***Note:*** *Now to check whether the installation is done correctly, type java -version in the Ter minal. You will see that java is running on your machine.*

- ***Notepad/gedit*** *: They are simple text-editor for writing java programs. Notepad is availa ble on Windows and gedit is available on Linux.*
- ***Eclipse IDE*** *: It is the most widely used IDE(Integrated Development Environment) for developing software in java. You can download Eclipse.*

C. MacOS Operating System

Step 1: Open the terminal from the application folder or simply press “command” and “shilft” key together and write initials of terminal as press enter.

> *It will be goof to have package manager such as hombrew installed in your machine as we can operate to install any software from here itself simply by using terminal commands.*

Step 2: Now in order to configure first write the command ‘java –version ‘ where the message below it will pop that there is no

```
java --version
javac --version
```

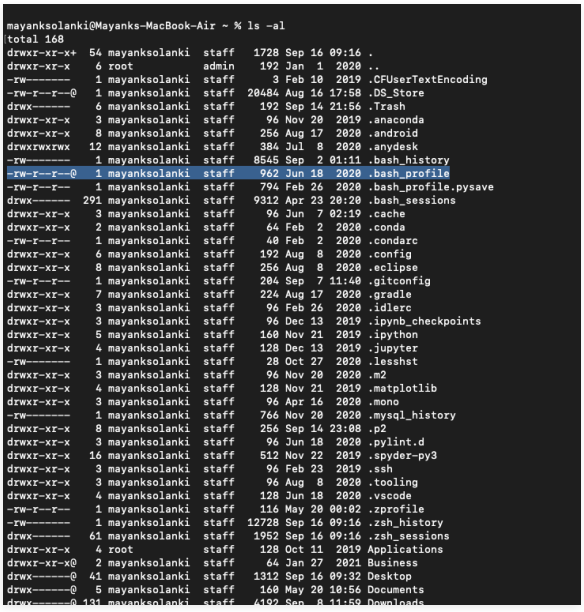
> ***Note:*** *If it was set up then you would have been getting the version displayed on the screen as it is shown below where in that machine it was already set up. So remember to cross-che ck in your machine once you have successfully set up in yours.*

```
mayanksolanki@Mayanks-MacBook-Air ~ % javac --version
javac 16.0.1
mayanksolanki@Mayanks-MacBook-Air ~ % java --version
openjdk 16.0.1 2021-04-20
OpenJDK Runtime Environment (build 16.0.1+9-24)
OpenJDK 64-Bit Server VM (build 16.0.1+9-24, mixed mode, sharing)
mayanksolanki@Mayanks-MacBook-Air ~ %
```

Step 2: Once we are done with installing JDK now let us move on setting up the java home environment variable for that you will have to look into something called s 'bash_profie' using the below command

```
ls -al
```

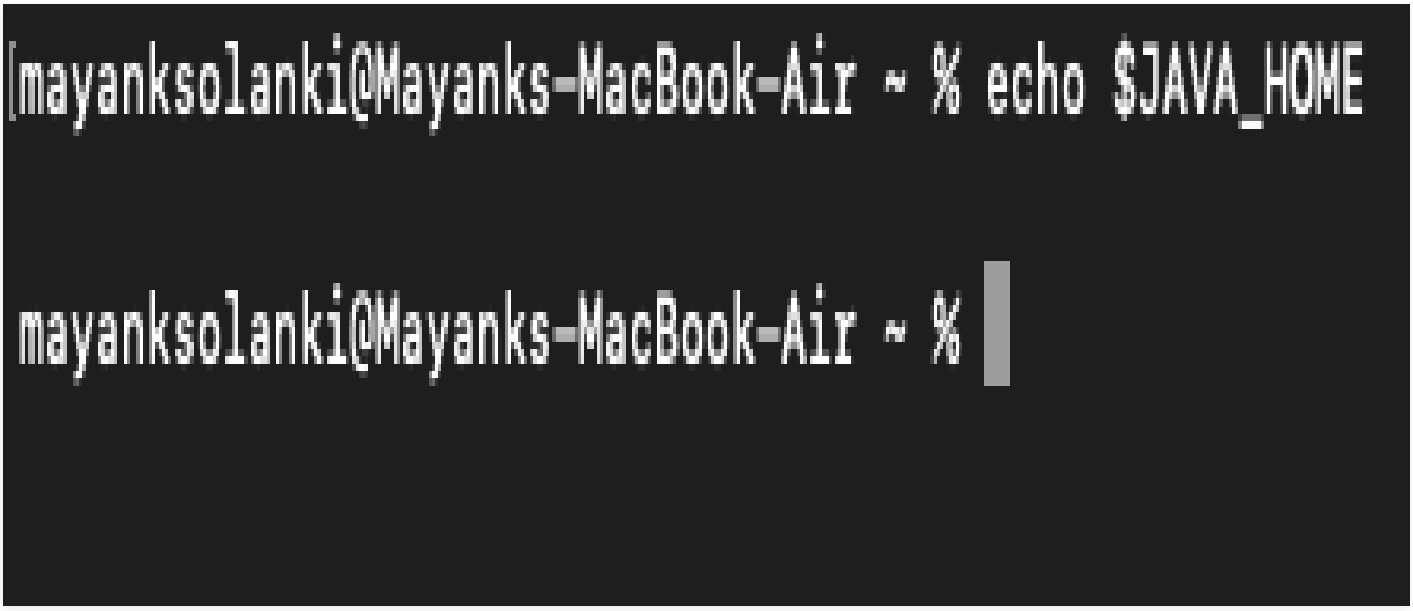
You will notice that in your terminal there will be no bash_profile set but it is shown below so here in this machine it is already set up. In order to setup if not there we have to create it for which lets us prior seek into java home variables whether it is set up or not.



```
mayanksolanki@Mayanks-MacBook-Air ~ % ls -al
total 168
drwxr-xr-x+  54 mayanksolanki  staff   1728 Sep 16 09:16 .
drwxr-xr-x    6 root          admin    192 Jan  1  2020 ..
-rw-------    1 mayanksolanki  staff      3 Feb 10  2019 .CFUserTextEncoding
-rw-r--r--@   1 mayanksolanki  staff  20484 Aug 16 17:58 .DS_Store
drwx------    6 mayanksolanki  staff    192 Sep 14 21:56 .Trash
drwxr-xr-x    3 mayanksolanki  staff     96 Nov 20  2019 .anaconda
drwxr-xr-x    8 mayanksolanki  staff    256 Aug 17  2020 .android
drwxrwxrwx   12 mayanksolanki  staff    384 Jul  8  2020 .anydesk
-rw-------    1 mayanksolanki  staff   8545 Sep  2 01:11 .bash_history
-rw-r--r--@   1 mayanksolanki  staff    962 Jun 18  2020 .bash_profile
-rw-r--r--    1 mayanksolanki  staff    794 Feb 26  2020 .bash_profile.pysave
drwx------  291 mayanksolanki  staff   9312 Apr 23 20:20 .bash_sessions
drwxr-xr-x    3 mayanksolanki  staff     96 Jun  7 02:19 .cache
drwxr-xr-x    2 mayanksolanki  staff     64 Feb  2  2020 .conda
-rw-r--r--    1 mayanksolanki  staff     40 Feb  2  2020 .condarc
drwxr-xr-x    6 mayanksolanki  staff    192 Aug  8  2020 .config
drwxr-xr-x    8 mayanksolanki  staff    256 Aug  8  2020 .eclipse
-rw-r--r--    1 mayanksolanki  staff    204 Sep  7 11:40 .gitconfig
drwxr-xr-x    7 mayanksolanki  staff    224 Aug 17  2020 .gradle
drwxr-xr-x    3 mayanksolanki  staff     96 Feb 26  2020 .idlerc
drwxr-xr-x    3 mayanksolanki  staff     96 Dec 13  2019 .ipynb_checkpoints
drwxr-xr-x    5 mayanksolanki  staff    160 Nov 21  2019 .ipython
drwxr-xr-x    4 mayanksolanki  staff    128 Dec 13  2019 .jupyter
-rw-------    1 mayanksolanki  staff     28 Oct 27  2020 .lesshst
drwxr-xr-x    3 mayanksolanki  staff     96 Nov 20  2020 .m2
drwxr-xr-x    4 mayanksolanki  staff    128 Nov 21  2019 .matplotlib
drwxr-xr-x    3 mayanksolanki  staff     96 Apr 16  2020 .mono
-rw-------    1 mayanksolanki  staff    766 Nov 20  2020 .mysql_history
drwxr-xr-x    8 mayanksolanki  staff    256 Sep 14 23:08 .p2
drwxr-xr-x    3 mayanksolanki  staff     96 Jun 18  2020 .pylint.d
drwxr-xr-x   16 mayanksolanki  staff    512 Nov 22  2019 .spyder-py3
drwxr-xr-x    3 mayanksolanki  staff     96 Feb 23  2019 .ssh
drwxr-xr-x    3 mayanksolanki  staff     96 Aug  8  2020 .tooling
drwxr-xr-x    4 mayanksolanki  staff    128 Jun 18  2020 .vscode
-rw-r--r--    1 mayanksolanki  staff    116 May 20 00:02 .zprofile
-rw-------    1 mayanksolanki  staff  12728 Sep 16 09:16 .zsh_history
drwx------   61 mayanksolanki  staff   1952 Sep 16 09:16 .zsh_sessions
drwxr-xr-x    4 root          staff    128 Oct 11  2019 Applications
drwxr-xr-x@   2 mayanksolanki  staff     64 Jan 27  2021 Business
drwx------@  41 mayanksolanki  staff   1312 Sep 16 09:32 Desktop
drwx------@   5 mayanksolanki  staff    160 May 20 10:56 Documents
drwx------@ 131 mayanksolanki  staff   4192 Sep  8 11:59 Downloads
```

Step 3: Setting up the home java variable. Using the below command to check or setup if not installed as follows on the terminal:

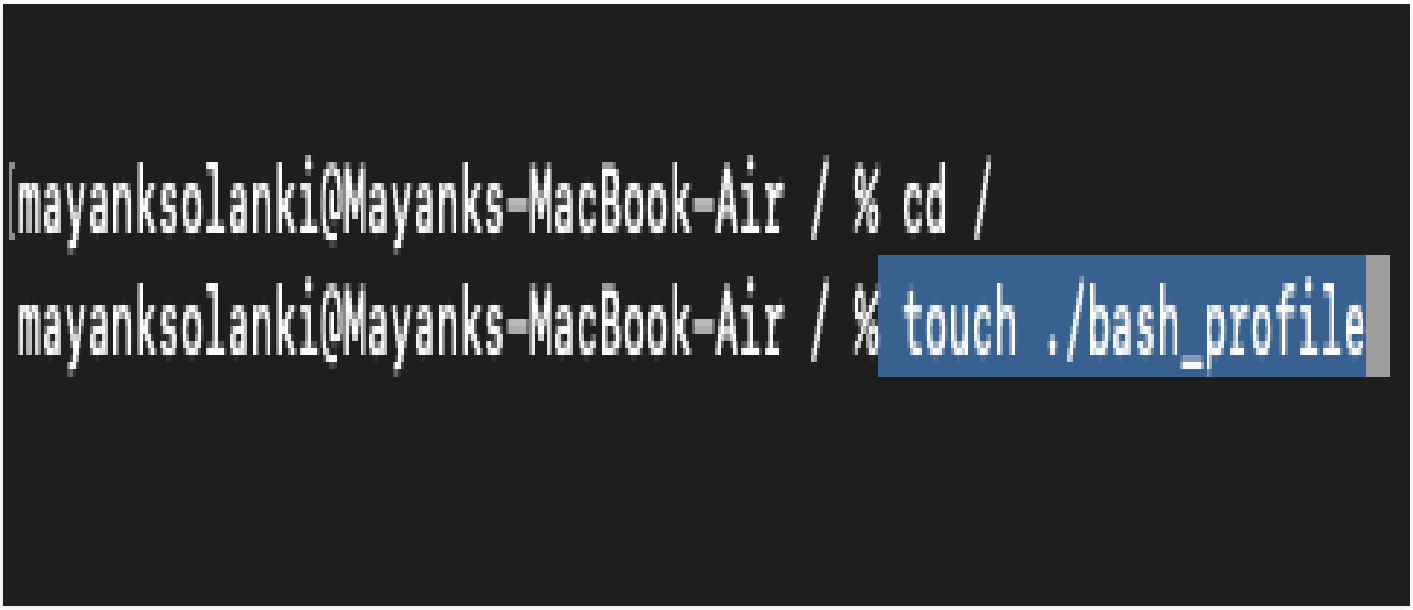
```
echo $JAVA_HOME
```



If it is showing blank then the java home variable is not set up as perceived from the above image.

Step 4: Installing bash_profile

Make sure to go to the root folder in the terminal and write the command 'touch ./bash_profile '

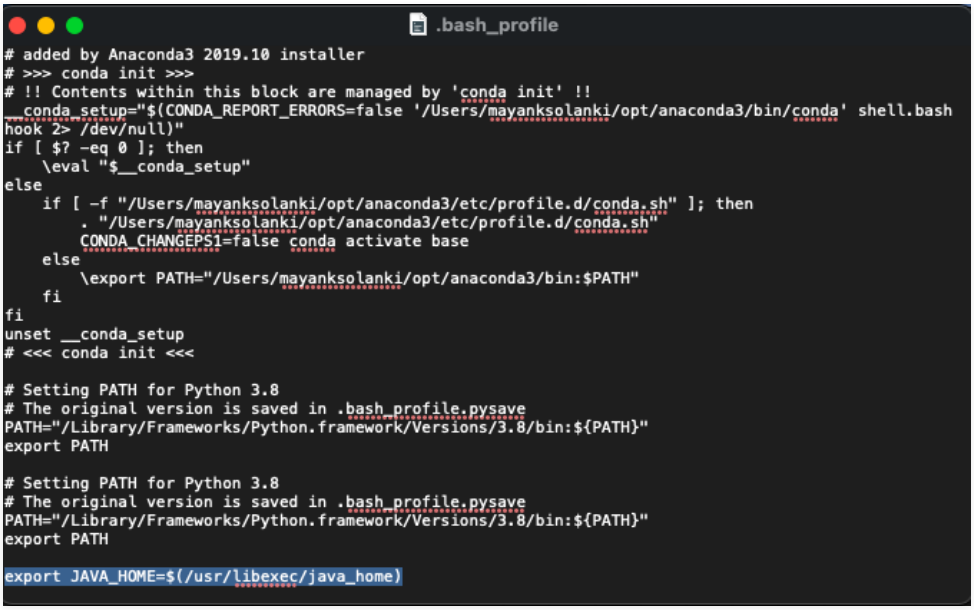


Now you will see that bash-profile s created which is as shown in step2 in your machine which hone can verify by writing command as follows:

```
ls -al
```

Step 5: Edit the .bash_profile created and for java, you just have to write the command marked in below media and provided below as follows:

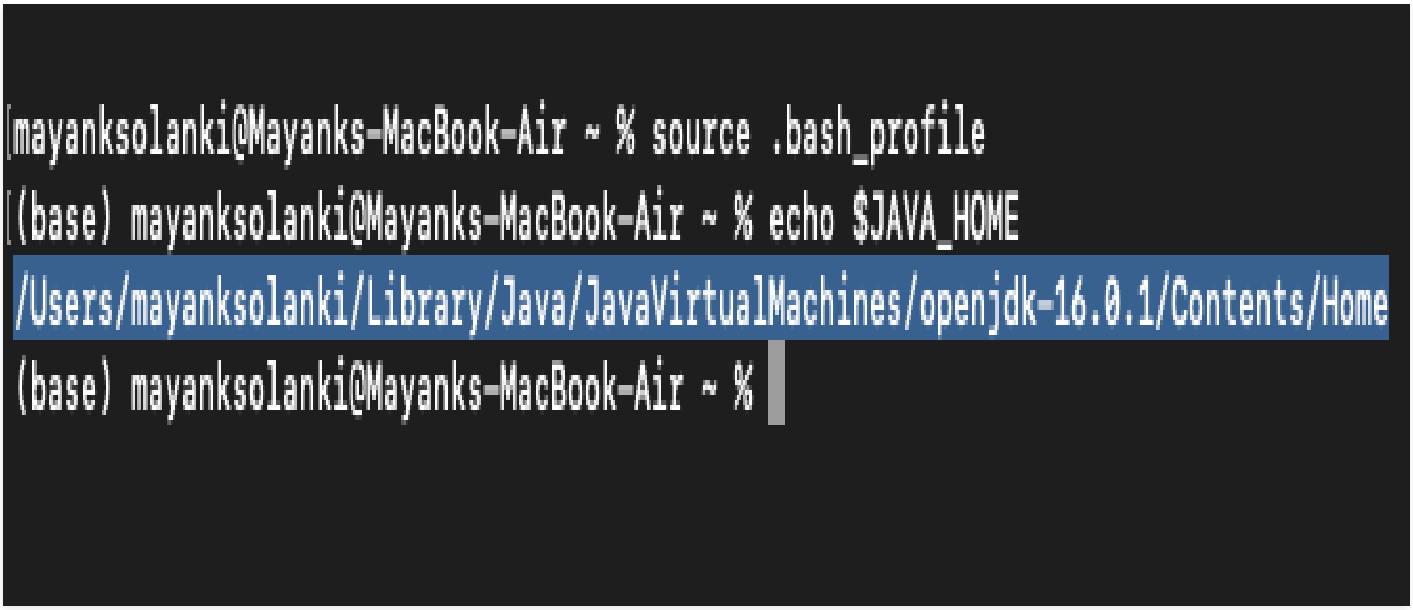
```
export JAVA_HOME=$(/usr/libexec/java_home)
// No need to remember this command
```



Save this file and relaunch the terminal by closing it.

Step 5: Verifying whether it is installed by entering the following two commands

```
source .bash_profile
echo $JAVA_HOME
```



Now from the above media, we can see the java variable is all set to go as earlier there was a blank therein the above media.