

## EXPERIMENT: 1

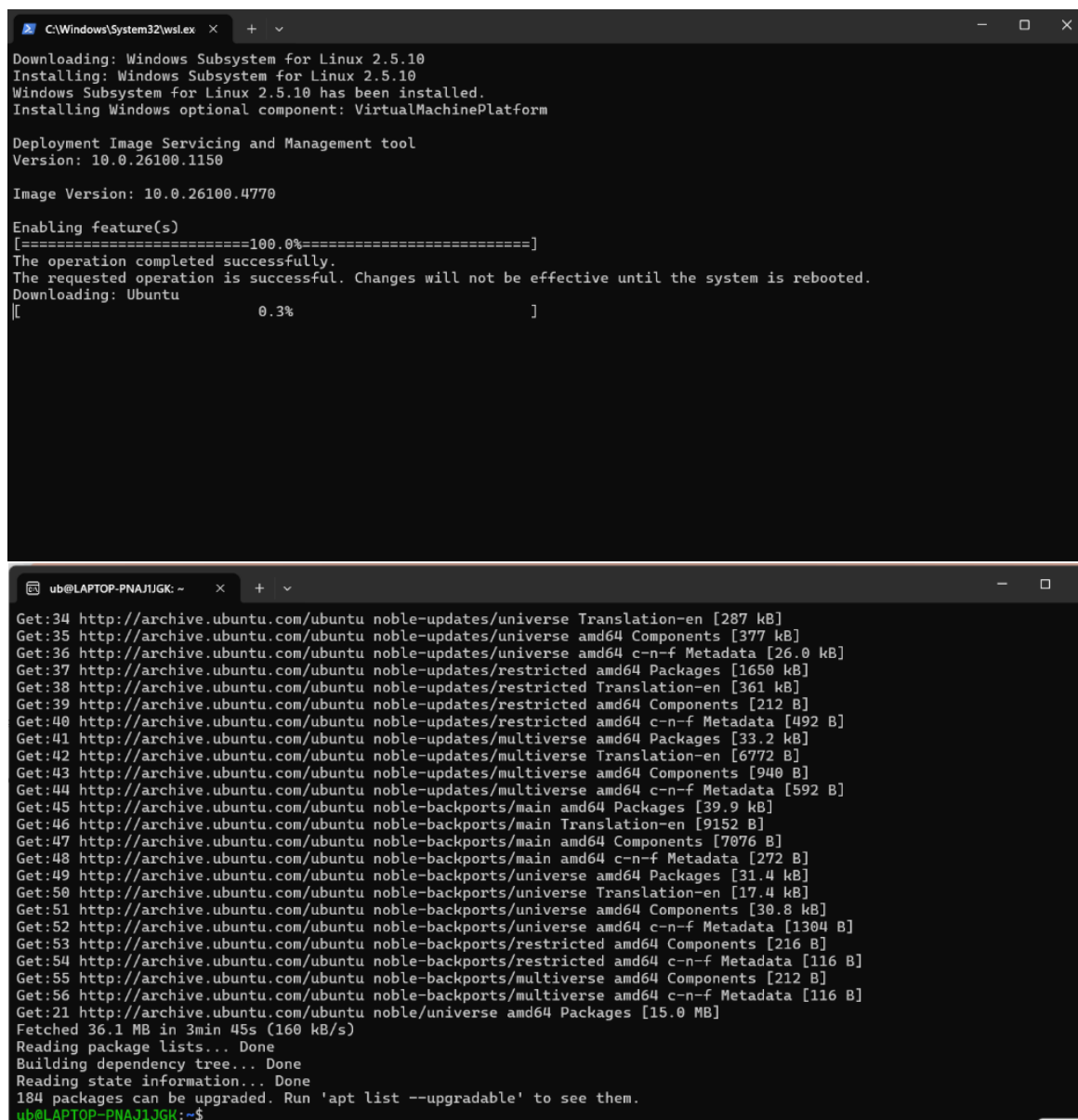
### **Aim: Installation of Java on Unix/Linux Machine (Without VirtualBox)**

■ This guide uses WSL (Windows Subsystem for Linux) to simulate a Linux environment directly on Windows.

#### **Step 1: Enable WSL**

1. Open PowerShell as Administrator
2. Run the following command:

wsl --install



```
C:\Windows\System32\wsl.exe
Downloading: Windows Subsystem for Linux 2.5.10
Installing: Windows Subsystem for Linux 2.5.10
Windows Subsystem for Linux 2.5.10 has been installed.
Installing Windows optional component: VirtualMachinePlatform

Deployment Image Servicing and Management tool
Version: 10.0.26100.1150

Image Version: 10.0.26100.4770

Enabling feature(s)
[=====100.0%=====]
The operation completed successfully.
The requested operation is successful. Changes will not be effective until the system is rebooted.
Downloading: Ubuntu
[ 0.3% ]

ub@LAPTOP-PNAJ1JGK: ~
Get:34 http://archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [287 kB]
Get:35 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [377 kB]
Get:36 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [26.0 kB]
Get:37 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [1650 kB]
Get:38 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [361 kB]
Get:39 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]
Get:40 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 c-n-f Metadata [492 B]
Get:41 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [33.2 kB]
Get:42 http://archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [6772 B]
Get:43 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:44 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [592 B]
Get:45 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Packages [39.9 kB]
Get:46 http://archive.ubuntu.com/ubuntu noble-backports/main Translation-en [9152 B]
Get:47 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7076 B]
Get:48 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [272 B]
Get:49 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [31.4 kB]
Get:50 http://archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [17.4 kB]
Get:51 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [30.8 kB]
Get:52 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1304 B]
Get:53 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:54 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]
Get:55 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Get:56 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]
Get:21 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]
Fetched 36.1 MB in 3min 45s (160 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
184 packages can be upgraded. Run 'apt list --upgradable' to see them.
ub@LAPTOP-PNAJ1JGK:~$
```

3. Restart your computer when prompted.
4. After restart, choose Ubuntu or install it from the Microsoft Store.

## Step 2: Open Ubuntu (WSL)

- Search for 'Ubuntu' in Start Menu and open it.
- It will initialize and ask for a username and password.

```
ub@LAPTOP-PNAJ1JGK: ~  
Installing, this may take a few minutes...  
Please create a default UNIX user account. The username does not need to match your Windows username.  
For more information visit: https://aka.ms/wslusers  
Enter new UNIX username: Anannya05  
err: Please enter a username matching the regular expression  
       configured via the NAME_REGEX configuration variable. Use the  
       '--allow-bad-names' option to relax this check or reconfigure  
       NAME_REGEX in configuration.  
Enter new UNIX username: ub  
New password:  
Retype new password:  
passwd: password updated successfully  
Installation successful!  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.6.87.2-microsoft-standard-WSL2 x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:       https://ubuntu.com/pro  
  
System information as of Thu Aug 14 05:34:38 UTC 2025  
  
System load:  0.32          Processes:            67  
Usage of /:   0.1% of 1006.85GB  Users logged in:    0  
Memory usage: 5%          IPv4 address for eth0: 192.168.158.153  
Swap usage:   0%
```

## Step 3: Update the Package List

Run the following command:

`sudo apt update`

```
ub@LAPTOP-PNAJ1JGK: ~  
Memory usage: 5%          IPv4 address for eth0: 192.168.158.153  
Swap usage: 0%  
  
This message is shown once a day. To disable it please create the  
/home/ub/.hushlogin file.  
ub@LAPTOP-PNAJ1JGK:~$ sudo apt update  
[sudo] password for ub:  
Hit:1 http://archive.ubuntu.com/ubuntu noble InRelease  
Get:2 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]  
Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]  
Get:4 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]  
Get:5 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [1056 kB]  
Get:6 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [183 kB]  
Get:7 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.6 kB]  
Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [7068 B]  
Get:9 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [878 kB]  
Get:10 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [194 kB]  
Get:11 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]  
Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [17.0 kB]  
Get:13 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [1566 kB]  
Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [343 kB]  
Get:15 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]  
Get:16 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [468 B]  
Get:17 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [18.5 kB]  
24% [Waiting for headers] [Waiting for headers] 188 kB/s 2min 46s^  
Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [4288 B]  
Get:19 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [212 B]  
Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [380 B]  
24% [Waiting for headers]
```

## Step 4: Install Java (OpenJDK 8 or 11)

- For Java 8:

`sudo apt install openjdk-8-jdk`

`-y`

```

ub@LAPTOP-PNAJ1JGK: ~
Setting up libopus0:amd64 (1.4-1build1) ...
Setting up libxv1:amd64 (2:1.0.11-1.1build1) ...
Setting up libvorbis0a:amd64 (1.3.7-1build3) ...
Setting up libpcsc-lite1:amd64 (2.0.3-1build1) ...
Setting up libgif7:amd64 (5.2.2-1ubuntu1) ...
Setting up fonts-dejavu-extra (2.37-8) ...
Setting up alsa-topology-conf (1.2.5.1-2) ...
Setting up libasyns0:amd64 (0.8-6build4) ...
Setting up xorg-sgml-doctools (1:1.11-1.1) ...
Setting up libgtk2.0-common (2.24.33-4ubuntu1.1) ...
Setting up libflac12t64:amd64 (1.4.3+ds-2.1ubuntu2) ...
Setting up libxkbfile1:amd64 (1:1.1.0-1build4) ...
Setting up ca-certificates-java (20240118) ...
No JRE found. Skipping Java certificates setup.
Setting up libsm6:amd64 (2:1.2.3-1build3) ...
Setting up libmp3lame0:amd64 (3.100-6build1) ...
Setting up libvorbisenc2:amd64 (1.3.7-1build3) ...
Setting up alsa-ucm-conf (1.2.10-1ubuntu5.7) ...
Setting up libnss3:amd64 (2:3.98-1build1) ...
Setting up libxt6t64:amd64 (1:1.2.1-1.2build1) ...
Setting up openjdk-8-jre-headless:amd64 (8u462-ga~us1-0ubuntu2~24.04.2) ...
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/java to provide /usr/bin/java (java) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/jjs to provide /usr/bin/jjs (jjs) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/keytool to provide /usr/bin/keytool (keytool) in au
to mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/pack200 to provide /usr/bin/pack200 (pack200) in au
to mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/jre/bin/rmid to provide /usr/bin/rmid (rmid) in auto mode
Progress: [ 78%] [#####.....]

```

## Step 5: Verify Java Installation

Run:

java -version

```

ub@LAPTOP-PNAJ1JGK:~$ java -version
openjdk version "1.8.0_462"
OpenJDK Runtime Environment (build 1.8.0_462-8u462-ga~us1-0ubuntu2~24.04.2-b08)
OpenJDK 64-Bit Server VM (build 25.462-b08, mixed mode)

```

## Step 6: Set JAVA\_HOME Environment Variable (Optional)

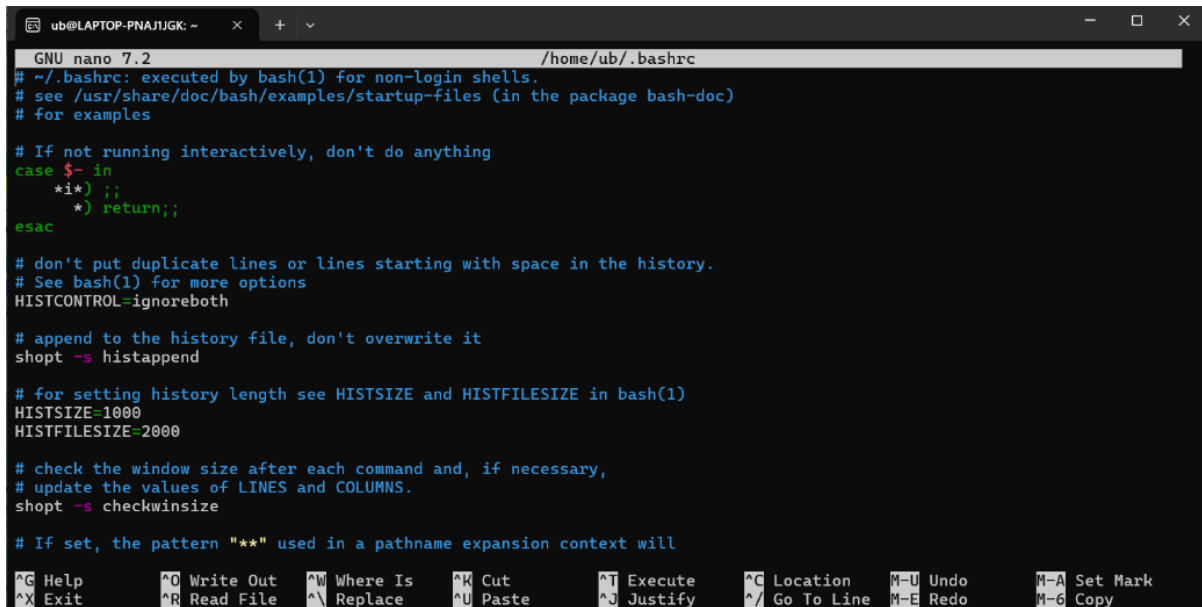
1. Open .bashrc file:

nano ~/.bashrc

```

ub@LAPTOP-PNAJ1JGK: ~
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jrunscript to provide /usr/bin/jrunscript (jrunscript)
in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jsadebugd to provide /usr/bin/jsadebugd (jsadebugd) in
auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jstack to provide /usr/bin/jstack (jstack) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jstat to provide /usr/bin/jstat (jstat) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jstatd to provide /usr/bin/jstatd (jstatd) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/native2ascii to provide /usr/bin/native2ascii (native2a
scii) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/rmic to provide /usr/bin/rmic (rmic) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/schemagen to provide /usr/bin/schemagen (schemagen) in
auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/serialver to provide /usr/bin/serialver (serialver) in
auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/wsgen to provide /usr/bin/wsgen (wsgen) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/wsimport to provide /usr/bin/wsimport (wsimport) in aut
o mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/xjc to provide /usr/bin/xjc (xjc) in auto mode
Setting up openjdk-8-jdk:amd64 (8u462-ga~us1-0ubuntu2~24.04.2) ...
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/appletviewer to provide /usr/bin/appletviewer (appletvi
ewer) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-openjdk-amd64/bin/jconsole to provide /usr/bin/jconsole (jconsole) in aut
o mode
Processing triggers for libc-bin (2.39-0ubuntu8.3) ...
ub@LAPTOP-PNAJ1JGK:~$ java -version
openjdk version "1.8.0_462"
OpenJDK Runtime Environment (build 1.8.0_462-8u462-ga~us1-0ubuntu2~24.04.2-b08)
OpenJDK 64-Bit Server VM (build 25.462-b08, mixed mode)
ub@LAPTOP-PNAJ1JGK:~$ nano ~/.bashrc

```



```
GNU nano 7.2 /home/ub/.bashrc
# ~/.bashrc: executed by bash(1) for non-login shells.
# see /usr/share/doc/bash/examples/startup-files (in the package bash-doc)
# for examples

# If not running interactively, don't do anything
case $- in
  *i*) ;;
  *) return;;
esac

# don't put duplicate lines or lines starting with space in the history.
# See bash(1) for more options
HISTCONTROL=ignoreboth

# append to the history file, don't overwrite it
shopt -s histappend

# for setting history length see HISTSIZE and HISTFILESIZE in bash(1)
HISTSIZE=1000
HISTFILESIZE=2000

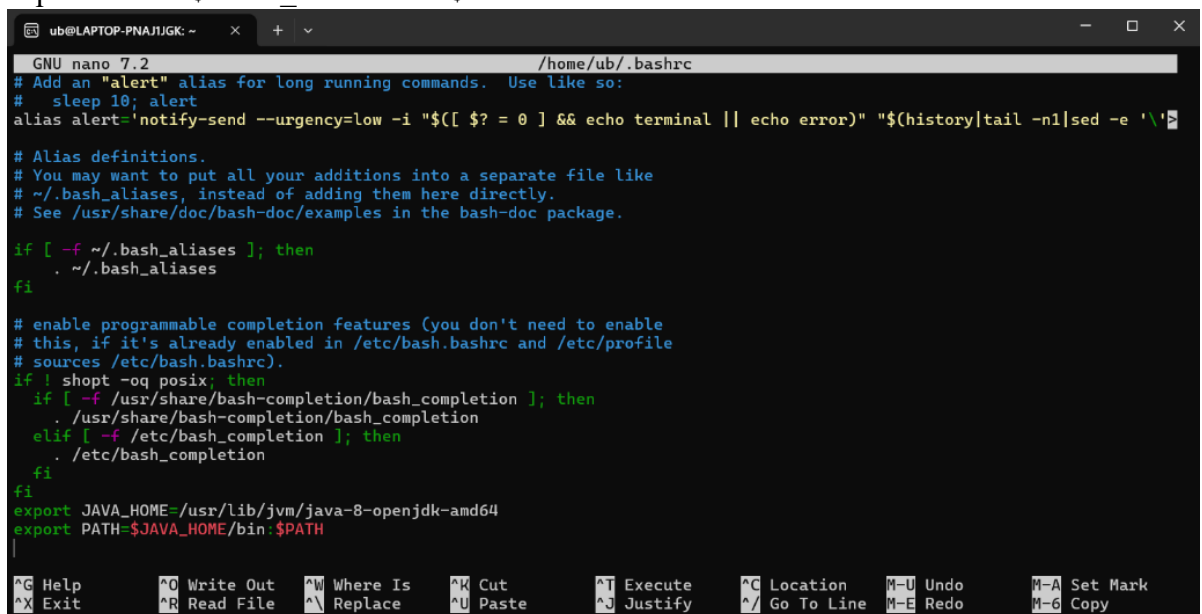
# check the window size after each command and, if necessary,
# update the values of LINES and COLUMNS.
shopt -s checkwinsize

# If set, the pattern "*" used in a pathname expansion context will
```

2. Add the following lines at the end:

```
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
```

```
export PATH=$JAVA_HOME/bin:$PATH
```



```
GNU nano 7.2 /home/ub/.bashrc
# Add an "alert" alias for long running commands. Use like so:
# sleep 10; alert
alias alert='notify-send --urgency=low -i "${?} = 0" && echo terminal || echo error)' "${history|tail -n1|sed -e '\>

# Alias definitions.
# You may want to put all your additions into a separate file like
# ~/.bash_aliases, instead of adding them here directly.
# See /usr/share/doc/bash-doc/examples in the bash-doc package.

if [ -f ~/.bash_aliases ]; then
  . ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
  if [ -f /usr/share/bash-completion/bash_completion ]; then
    . /usr/share/bash-completion/bash_completion
  elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
  fi
fi
export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64
export PATH=$JAVA_HOME/bin:$PATH
```

3. Save and exit (Ctrl+X, then Y, then Enter)

4. Reload bashrc: source ~/.bashrc

```
ub@LAPTOP-PNAJ1JGK:~$ source ~/.bashrc
```

5. Verify JAVA\_HOME is set:

```
echo $JAVA_HOME
```

```
ub@LAPTOP-PNAJ1JGK:~$ echo $JAVA_HOME
/usr/lib/jvm/java-8-openjdk-amd64
```