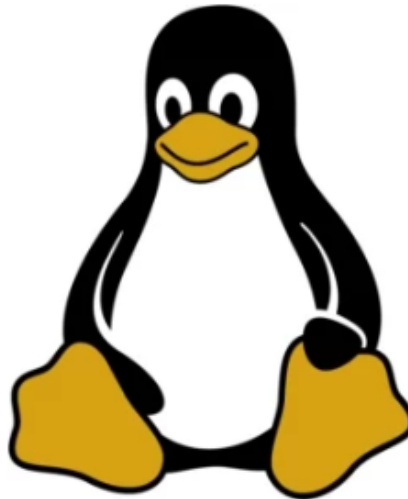


Learn basic commands for Linux, a free and open-source operating system that you can make changes to and redistribute.

ARTICLE

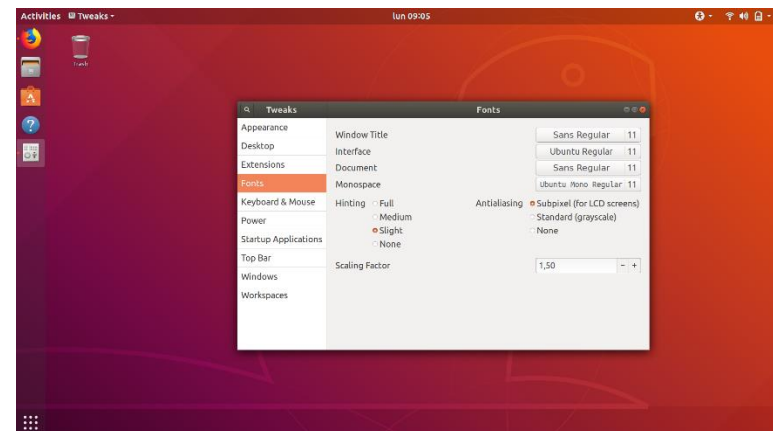
What Is Linux?



- <https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners>

Linux is an operating system's kernel. You might have heard of UNIX. Well, Linux is a UNIX clone. But it was actually created by Linus Torvalds from Scratch. Linux is free and open-source, that means that you can simply change anything in Linux and redistribute it in your own name! There are several Linux Distributions, commonly called “distros”.

- Ubuntu Linux
- Red Hat Enterprise Linux
- Linux Mint
- Debian
- Fedora



Linux is Mainly used in servers. About 90% of the internet is powered by Linux servers. This is because Linux is fast, secure, and free! The main problem of using Windows servers are their cost. This is solved by using Linux servers. The OS that runs in about 80% of the smartphones in the world, Android, is also made from the Linux kernel. Most of the viruses in the world run on Windows, but not on Linux!

Linux Shell or “Terminal”

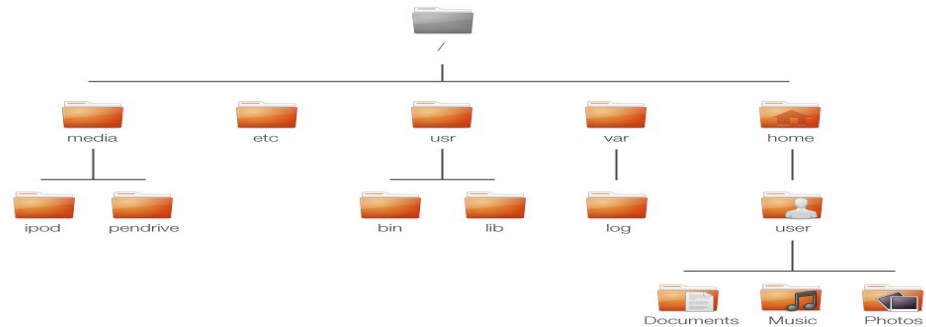
So, basically, a shell is a program that receives commands from the user and gives it to the OS to process, and it shows the output. Linux's shell is its main part. Its distros come in GUI (graphical user interface), but basically, Linux has a CLI (command line interface). In this tutorial, we are going to cover the basic commands that we use in the shell of Linux.



Linux Commands



Basic Commands



1. pwd — When you first open the terminal, you are in the home directory of your user. To know which directory you are in, you can use the “**pwd**” command. It gives us the absolute path, which means the path that starts from the root. The root is the base of the Linux file system. It is denoted by a forward slash(/). The user directory is usually something like “/home/username”.

```
nayso@Alok-Aspire:~$ pwd
```

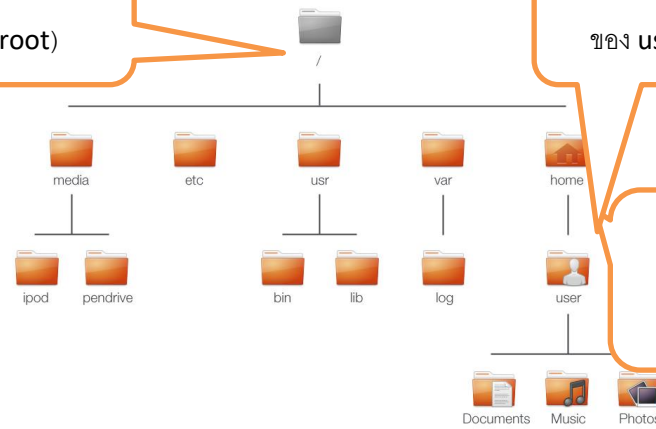
2. ls — Use the “**ls**” command to know what files are in the directory you are in. You can see all the hidden files by using the command “**ls -a**”.

```
nayso@Alok-Aspire:~$ ls
Desktop          itsuserguide.desktop  reset-settings         VCD_Copy
Documents        Music                  School_Resources      Videos
Downloads        Pictures               Students_Works_10
examples.desktop Public                 Templates
GplatesProject   Qgis Projects         TuxPaint-Pictures
```

3. **cd** — Use the "cd" command to go to a directory. For example, if you are in the home folder, and you want to go to the downloads folder, then you can type in "**cd Downloads**". Remember, this command is case sensitive, and you have to type in the name of the folder exactly as it is. But there is a problem with these commands. Imagine you have a folder named "Raspberry Pi". In this case, when you type in "**cd Raspberry Pi**", the shell will take the second argument of the command as a different one, so you will get an error saying that the directory does not exist. Here, you can use a backward slash. That is, you can use "**cd Raspberry\ Pi**" in this case. Spaces are denoted like this: If you just type "**cd**" and press enter, it takes you to the home directory. To go back from a folder to the folder before that, you can type "**cd ..**". The two dots represent back.

```
nayso@Alok-Aspire:~$ cd Downloads
nayso@Alok-Aspire:~/Downloads$ cd
nayso@Alok-Aspire:~$ cd Raspberry\ Pi
nayso@Alok-Aspire:~/Raspberry Pi$ cd ..
nayso@Alok-Aspire:~$
```

root (ต้องมีสิทธิ์
ของ root)



Home directory
ของ user ใดๆ

Default user
สำหรับ live คือ
ubuntu

4. **mkdir & rmdir** — Use the **mkdir** command when you need to create a folder or a directory. For example, if you want to make a directory called “DIY”, then you can type “**mkdir DIY**”. Remember, as told before, if you want to create a directory named “DIY Hacking”, then you can type “**mkdir DIY\ Hacking**”. Use **rmdir** to delete a directory. But **rmdir** can only be used to delete an empty directory. To delete a directory containing files, use **rm**.

```
nayso@Alok-Aspire:~/Desktop$ ls
nayso@Alok-Aspire:~/Desktop$ mkdir DIY
nayso@Alok-Aspire:~/Desktop$ ls
DIY
nayso@Alok-Aspire:~/Desktop$ rmdir DIY
nayso@Alok-Aspire:~/Desktop$ ls
nayso@Alok-Aspire:~/Desktop$
```

5. **rm** - Use the **rm** command to delete files and directories. Use “**rm -r**” to delete just the directory. It deletes both the folder and the files it contains when using only the **rm** command.

```
nayso@Alok-Aspire:~/Desktop$ ls
newer.py  New Folder
nayso@Alok-Aspire:~/Desktop$ rm newer.py
nayso@Alok-Aspire:~/Desktop$ ls
New Folder
nayso@Alok-Aspire:~/Desktop$ rm -r New\ Folder
nayso@Alok-Aspire:~/Desktop$ ls
nayso@Alok-Aspire:~/Desktop$
```


6. touch — The **touch** command is used to create a file. It can be anything, from an empty txt file to an empty zip file. For example, “**touch new.txt**”.

```
nayso@Alok-Aspire:~/Desktop$ ls
nayso@Alok-Aspire:~/Desktop$ touch new.txt
nayso@Alok-Aspire:~/Desktop$ ls
new.txt
```

7. man & --help — To know more about a command and how to use it, use the **man** command. It shows the manual pages of the command. For example, “**man cd**” shows the manual pages of the **cd** command. Typing in the command name and the argument helps it show which ways the command can be used (e.g., **cd -help**).

```
TOUCH(1)                                User Commands                                TOUCH(1)

NAME
    touch - change file timestamps

SYNOPSIS
    touch [OPTION]... FILE...

DESCRIPTION
    Update the access and modification times of each FILE to the current
    time.

    A FILE argument that does not exist is created empty, unless -c or -h
    is supplied.

    A FILE argument string of - is handled specially and causes touch to
    change the times of the file associated with standard output.

    Mandatory arguments to long options are mandatory for short options
    too.

    -a      change only the access time

Manual page touch(1) line 1 (press h for help or q to quit)
```

8. cp — Use the **cp** command to copy files through the command line. It takes two arguments: The first is the location of the file to be copied, the second is where to copy.

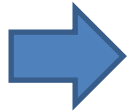
```
nayso@Alok-Aspire:~/Desktop$ ls /home/nayso/Music/  
nayso@Alok-Aspire:~/Desktop$ cp new.txt /home/nayso/Music/  
nayso@Alok-Aspire:~/Desktop$ ls /home/nayso/Music/  
new.txt
```

9. mv — Use the **mv** command to move files through the command line. We can also use the **mv** command to rename a file. For example, if we want to rename the file “**text**” to “**new**”, we can use “**mv text new**”. It takes the two arguments, just like the **cp** command.

```
nayso@Alok-Aspire:~/Desktop$ ls  
new.txt  
nayso@Alok-Aspire:~/Desktop$ mv new.txt newer.txt  
nayso@Alok-Aspire:~/Desktop$ ls  
newer.txt
```


10. locate — The **locate** command is used to locate a file in a Linux system, just like the search command in Windows. This command is useful when you don't know where a file is saved or the actual name of the file. Using the **-i** argument with the command helps to ignore the case (it doesn't matter if it is uppercase or lowercase). So, if you want a file that has the word "hello", it gives the list of all the files in your Linux system containing the word "hello" when you type in "**locate -i hello**". If you remember two words, you can separate them using an asterisk (*). For example, to locate a file containing the words "hello" and "this", you can use the command "**locate -i *hello*this**".

```
nayso@Alok-Aspire:~$ locate newer.txt
/home/nayso/Desktop/newer.txt
nayso@Alok-Aspire:~$ locate *DIY*Hacking*
/home/nayso/DIY Hacking
```



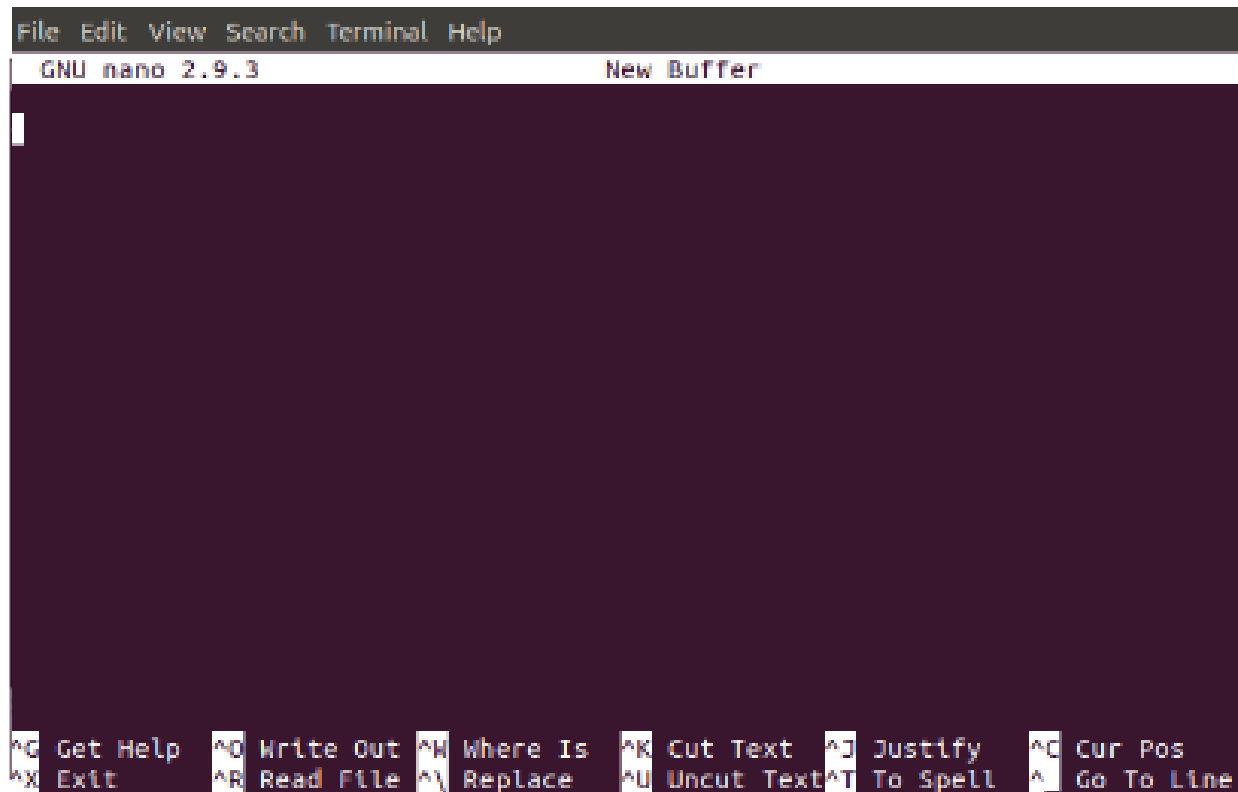
Intermediate Commands

1. echo — The "**echo**" command helps us move some data, usually text into a file. For example, if you want to create a new text file or add to an already made text file, you just need to type in, "**echo hello, my name is alok >> new.txt**". You do not need to separate the spaces by using the backward slash here, because we put in two triangular brackets when we finish what we need to write.

2. cat — Use the **cat** command to display the contents of a file. It is usually used to easily view programs.

```
nayso@Alok-Aspire:~/Desktop$ echo hello, my name is alok >> new.txt
nayso@Alok-Aspire:~/Desktop$ cat new.txt
hello, my name is alok
nayso@Alok-Aspire:~/Desktop$ echo this is another line >> new.txt
nayso@Alok-Aspire:~/Desktop$ cat new.txt
hello, my name is alok
this is another line
```

3. **nano, vi, jed** — **nano** and **vi** are already installed text editors in the Linux command line. The **nano** command is a good text editor that denotes keywords with color and can recognize most languages. And **vi** is simpler than **nano**. You can create a new file or modify a file using this editor. For example, if you need to make a new file named "**check.txt**", you can create it by using the command "**nano check.txt**". You can save your files after editing by using the sequence Ctrl+X, then Y (or N for no). In my experience, using **nano** for HTML editing doesn't seem as good, because of its color, so I recommend **jed** text editor. We will come to installing packages soon.



```
File Edit View Search Terminal Help
GNU nano 2.9.3 New Buffer

^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify   ^C Cur Pos
^X Exit      ^R Read File ^\ Replace  ^U Uncut Text ^T To Spell  ^_ Go To Line
```

4. **sudo** — A widely used command in the Linux command line, **sudo** stands for "SuperUser Do". So, if you want any command to be done with administrative or root privileges, you can use the **sudo** command. For example, if you want to edit a file like **viz. alsa-base.conf**, which needs root permissions, you can use the command – **sudo nano alsa-base.conf**. You can enter the root command line using the command "**sudo bash**", then type in your user password. You can also use the command "**su**" to do this, but you need to set a root password before that. For that, you can use the command "**sudo passwd**" (not misspelled, it is **passwd**). Then type in the new root password.

```
nayso@Alok-Aspire:~/Desktop$ sudo passwd
[sudo] password for nayso:
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
nayso@Alok-Aspire:~/Desktop$ su
Password:
root@Alok-Aspire:/home/nayso/Desktop#
```

5. **df** — Use the **df** command to see the available disk space in each of the partitions in your system. You can just type in **df** in the command line and you can see each mounted partition and their used/available space in % and in KBs. If you want it shown in megabytes, you can use the command “**df -m**”.

```
root@Alok-Aspire:/home/nayso/Desktop# df -m
Filesystem      1M-blocks  Used Available Use% Mounted on
udev             940        1      940      1% /dev
tmpfs            191        2      189      1% /run
/dev/sda5        96398 23466    68013    26% /
none              1         0         1     0% /sys/fs/cgroup
none              5         0         5     0% /run/lock
none            951        1      950      1% /run/shm
none            100        1      100      1% /run/user
```

6. **du** — Use **du** to know the disk usage of a file in your system. If you want to know the disk usage for a particular folder or file in Linux, you can type in the command **du** and the name of the folder or file. For example, if you want to know the disk space used by the documents folder in Linux, you can use the command “**du Documents**”. You can also use the command “**ls -lah**” to view the file sizes of all the files in a folder.

```
nayso@Alok-Aspire:~$ du Documents
516  Documents/DIYHacking
548  Documents
```

7. **tar** — Use **tar** to work with tarballs (or files compressed in a tarball archive) in the Linux command line. It has a long list of uses. It can be used to compress and uncompress different types of tar archives like **.tar**, **.tar.gz**, **.tar.bz2**, etc. It works on the basis of the arguments given to it. For example, "**tar -cvf**" for creating a **.tar** archive, **-xvf** to untar a tar archive, **-tvf** to list the contents of the archive, etc. Since it is a wide topic, here are some [examples of tar commands](#).

8. **zip**, **unzip** — Use **zip** to compress files into a zip archive, and **unzip** to extract files from a zip archive.

9. **uname** — Use **uname** to show the information about the system your Linux distro is running. Using the command "**uname -a**" prints most of the information about the system. This prints the kernel release date, version, processor type, etc.

```
nayso@Alok-Aspire:~$ uname -a
Linux Alok-Aspire 4.4.0-22-generic #40~14.04.1-Ubuntu SMP Fri May 13 17:27:18 UTC
2016 i686 i686 i686 GNU/Linux
```


10. apt-get — Use **apt** to work with packages in the Linux command line. Use **apt-get** to install packages. This requires root privileges, so use the **sudo** command with it. For example, if you want to install the text editor **jed** (as I mentioned earlier), we can type in the command “**sudo apt-get install jed**”. Similarly, any packages can be installed like this. It is good to update your repository each time you try to install a new package. You can do that by typing “**sudo apt-get update**”. You can upgrade the system by typing “**sudo apt-get upgrade**”. We can also upgrade the distro by typing “**sudo apt-get dist-upgrade**”. The command “**apt-cache search**” is used to search for a package. If you want to search for one, you can type in “**apt-cache search jed**”(this doesn't require root).

```
nayso@Alok-Aspire:~$ sudo apt-get install jed
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  jed-common libslang2-modules slsh
Suggested packages:
  gpm
The following NEW packages will be installed:
  jed jed-common libslang2-modules slsh
0 upgraded, 4 newly installed, 0 to remove and 419 not upgraded.
Need to get 810 kB of archives.
After this operation, 2,992 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```


11. chmod — Use **chmod** to make a file executable and to change the permissions granted to it in Linux. Imagine you have a python code named **numbers.py** in your computer. You'll need to run "**python numbers.py**" every time you need to run it. Instead of that, when you make it executable, you'll just need to run "**numbers.py**" in the terminal to run the file. To make a file executable, you can use the command "**chmod +x numbers.py**" in this case. You can use "**chmod 755 numbers.py**" to give it root permissions or "**sudo chmod +x numbers.py**" for root executable. Here is some more [information about the chmod command](#).

```
nayso@Alok-Aspire:~/Desktop$ ls
numbers.py
nayso@Alok-Aspire:~/Desktop$ chmod +x numbers.py
nayso@Alok-Aspire:~/Desktop$ ls
numbers.py
```

12. hostname — Use **hostname** to know your name in your host or network. Basically, it displays your hostname and IP address. Just typing "**hostname**" gives the output. Typing in "**hostname -I**" gives you your IP address in your network.

```
nayso@Alok-Aspire:~/Desktop$ hostname
Alok-Aspire
nayso@Alok-Aspire:~/Desktop$ hostname -I
192.168.1.36
```

```
C:\Users\osuntana>wsl -u root
root@DESKTOP-IQOCR48:/mnt/c/Users/osuntana#
root@DESKTOP-IQOCR48:/mnt/c/Users/osuntana# wsl -u root
```

Command 'wsl' not found, but can be installed with:

```
apt install wsl
```

```
root@DESKTOP-IQOCR48:/mnt/c/Users/osuntana# passwd
New password:
Retype new password:
passwd: password updated successfully
root@DESKTOP-IQOCR48:/mnt/c/Users/osuntana#
```

```
kru@DESKTOP-IQOCR48:~$ su
```

```
Password:
```

```
root@DESKTOP-IQOCR48:/home/kru# passwd kru
```

```
New password:
```

```
Retype new password:
```

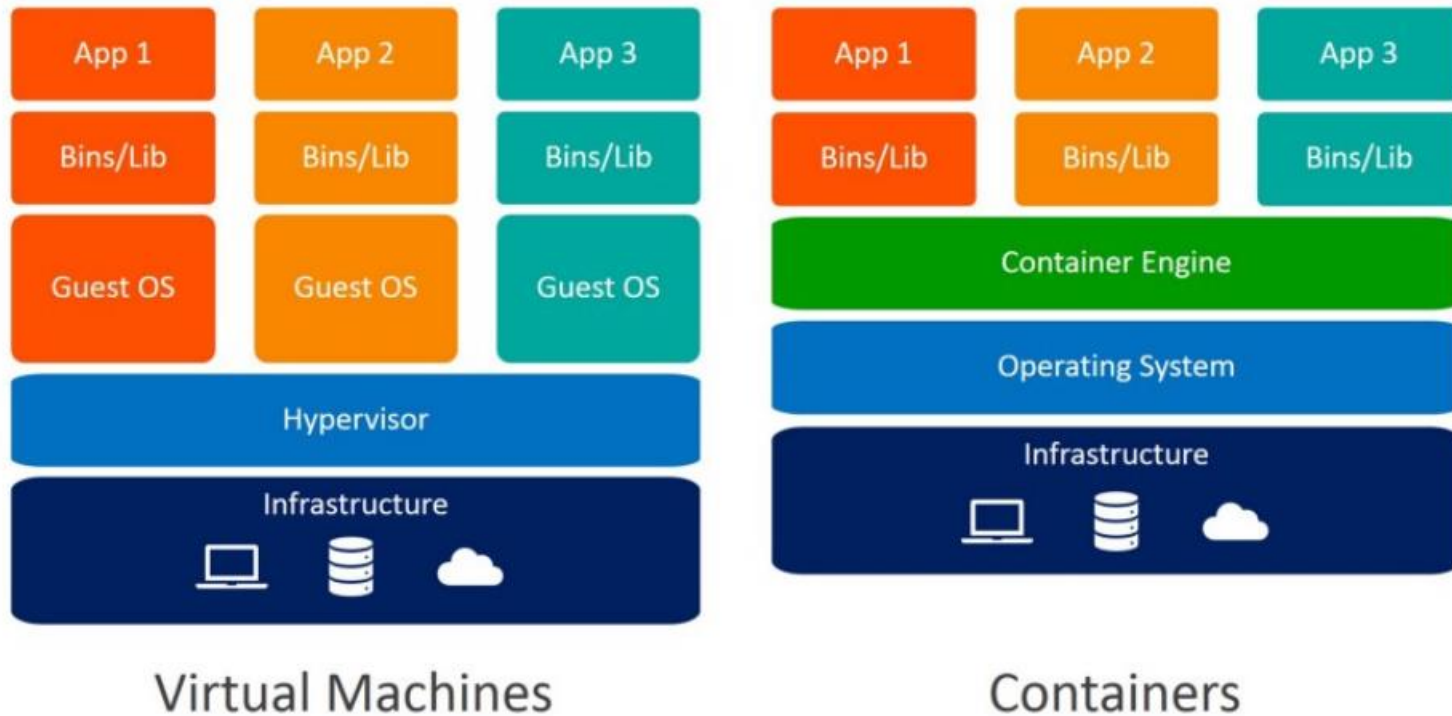
```
passwd: password updated successfully
```

```
root@DESKTOP-IQOCR48:/home/kru# exit
```

```
exit
```

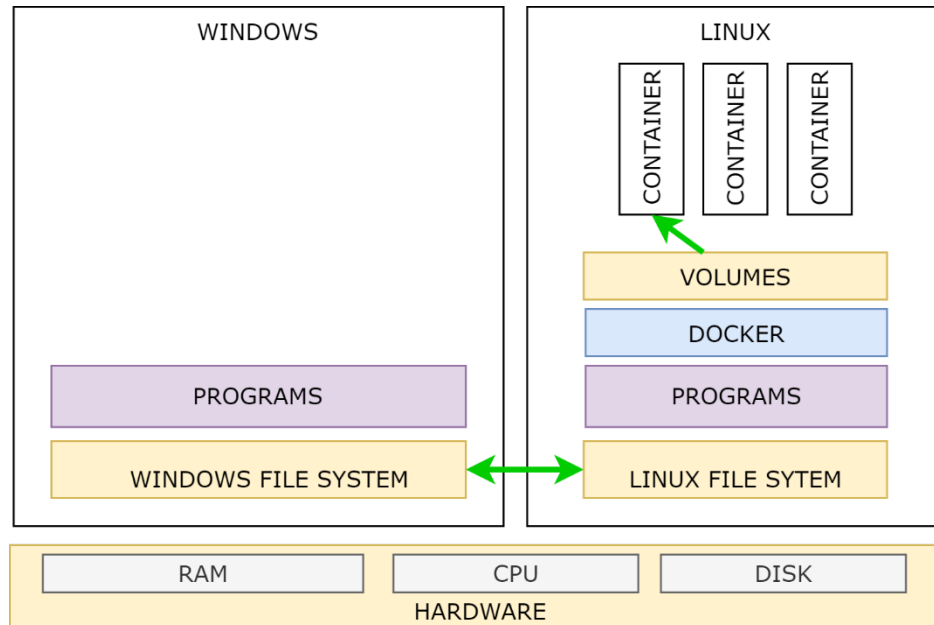
```
kru@DESKTOP-IQOCR48:~$
```

vm vs container



credit : <https://www.bmc.com/blogs/containers-vs-virtual-machines/>

<https://ai1love6.medium.com/docker-คืออะไร-abc352106cf5>



Is Docker and container the same?



A **Docker** image is an immutable (unchangeable) file that contains the source code, libraries, dependencies, tools, and other files needed for an application to run. Due to their read-only quality, these images are sometimes referred to as snapshots. ... A **container** is, ultimately, just a running image. Oct 31, 2019

A. หลังจาก เข้าระบบได้แล้ว

1. จุดสังเกตว่าเราเป็น root คือ prompt ปิดด้วยเครื่องหมาย #
2. Update path of package `sudo apt-get update`
3. (ถ้า wifi ไม่มี) Install Wifi package :
`sudo apt-get install bcmwl-kernel-source`
4. ลง C compiler : `sudo apt-get install gcc`
(บางเครื่องจะลง c compiler ไม่ได้ ต้อง update kernel)



B. <https://winaero.com/reset-password-wsl-linux-distro-windows-10/>

C. ทางเลือก Editor (สำหรับ helloWorld.c)

1. ใช้ `gedit`
(notepad บน Ubuntu)
2. ให้ใช้ `nano` เขียน
(พิมพ์ `nano` ที่ prompt)
3. ที่ windows save helloWorld.c ที่
`d:\osLab\helloWorld.c` แล้ว
`cp /mnt/d/osLab/helloWorld.c ~`
 - `C:\Users\NAME\AppData\Local\`

```
#include <stdio.h>
int main() {
    // printf() displays the string inside quotation
    printf("Hello, World!");
    return 0;
}
```

D. เปิด 2 terminal จะได้ไม่ต้องเข้าๆออกๆ

remark

1. Case WSL (<https://youtu.be/av0UQy6g2FA>)

1. เข้าแล้วระบบให้ตั้ง password new **user** (คุณนั่นเอง)
2. นิสัยเดิมของ **unix** ตอนตั้ง password คือ **cursor** ไม่เลื่อน (ไม่ตอบสนองแต่**จริงๆแล้วคีย์บอร์ดทำงานปกติ**)
3. พิมพ์ **sudo passwd** แล้วตั้ง password ของ **root** เป็น **password** (ไม่เหมือนกับ **user** น่าจะดี จะได้ดังสติได้ว่าเป็น **user** หน่อย)
4. จำ **user** ของตนเองไว้ (คราวหน้านั่งที่เดิม เพราะไม่จำเป็นต้องมาสร้าง **user** ทุกครั้ง)

2. vmware

3. Oracle Virtual Box

1. Download Oracle Virtual Box
2. Download Ubuntu 18.04 iso
3. <https://youtu.be/CkDd6jClqEE?t=326> (Install Ubuntu Linux on VirtualBox in Windows 7 (sakitech))
 1. Choose **install** not live

4. macOS ถ้าสุดเหมือนมี vm ให้ใช้

5. ใช้ rufus หรือที่สร้าง (UEFI) Ubuntu from **USB**

1. Choose **live** not install

1. ติดตั้ง

Ubuntu

2. ลอง gcc

1. gcc -o
joopjang
hello.c

3. ลอง CLI

ถ้าไม่มี -o
จะได้ a.out

input

3.1 man มีไว้เพื่อ _____

3.2 pwd มีไว้เพื่อ _____

3.3 ls มีไว้เพื่อ _____

3.4 mkdir มีไว้เพื่อ _____

3.5 สร้าง directory ชื่อ sub1 ด้วยคำสั่ง _____

3.6 cp มีไว้เพื่อ _____

3.7 คัดลอกไฟล์ HelloWorld.c ไปไว้ใน sub1
และเปลี่ยนชื่อเป็น test.txt . ใช้คำสั่ง _____

3.8 cd มีไว้เพื่อ _____

3.9 เข้าไปใน sub1 ใช้คำสั่ง _____

3.10 current directory ตอนนี้คือ _____

3.11 พิมพ์ cd /

3.12 พิมพ์ mkdir atroot

3.13 เหตุใดถึงเกิด error _____

3.14 พิมพ์ su

3.15 พิมพ์ mkdir atroot

3.16 พิมพ์ cp sub1/test.txt .

3.17 เหตุใดถึงเกิด error _____

3.18 current directory ขณะนี้คือ _____

3.19 พิมพ์ exit

3.20 พิมพ์ cd

3.21 พิมพ์ cp sub1/test.txt /atroot

3.22 เหตุใดถึงเกิด error _____

3.23 พิมพ์ sudo cp sub1/test.txt /atroot

3.24 สร้าง directory sub1/sub2

3.25 cp ~/test.txt /home/Ubuntu/sub1/sub2

3.26 จะ copy ให้สำเร็จ อ้างถึง test.txt ด้วย
~/ _____

3.27 พิมพ์ cd

3.28 current directory ขณะนี้คือ _____

3.29 (ใช้ rm) ลบ sub1 ใช้คำสั่ง _____

3.30 ลบ /atroot ใช้คำสั่ง _____

Update path of package :

```
sudo apt upgrade
```

```
sudo apt update
```

```
sudo apt install build-essential
```

Install Wifi package :

```
sudo apt-get install bcmwl-kernel-source
```

๙ C compiler :

```
sudo apt install gcc //sudo apt-get install gcc
```

๙ Compile : gcc -o targetFileName source.c

Python os module

Python Tutorial: OS Module - Use Underlying Operating System Functionality Apr 6, 2016 (<https://youtu.be/tJxcKyFMTGo>)

Python Tutorial: Automate Parsing and Renaming of Multiple Files Dec 23, 2015 (<https://youtu.be/ve2pmm5Jqml>)