

# **NETWORKING AND SYSTEM ADMINISTRATION LAB(20MCA136)**

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**ROLL.NO: 08**

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## **BASIC COMMAND LINE**

### **1. Pwd(Print Working Directory)**

- Used to find the path of the current working directory
- Absolute path Which is basically a path of all the directories that start with a forward slash()
- Relative path defined as the path related to the present working directory From root directory

```
aleena@aleena-VirtualBox:~/Desktop$ pwd  
/home/aleena/Desktop  
aleena@aleena-VirtualBox:~/Desktop$ █
```

### **2. History**

- To review the commands, you have entered before

```
aleena@aleena-VirtualBox:~/Desktop$ history  
 1  pwd  
 2  man  
 3  man pwd  
 4  pwd  
 5  history  
 6  pwd  
 7  man man  
 8  cd  
 9  cd ..  
10  cd -  
11  ls  
12  ls -l  
13  ls -ol  
14  ls -R  
15  ls -t  
16  ls -r  
17  mkdir abcd  
18  ls  
19  mkdir -p trade/trade1  
20  ls  
21  rmdir abcd  
22  ls  
23  touch new.txt  
24  ls  
25  rm new.txt  
26  ls
```

### 3. Man

- Shows the manual instruction of the tail command

Man, man to start learning about man utility

```
aleena@aleena-VirtualBox:~/Desktop$ man ls
aleena@aleena-VirtualBox:~/Desktop$
```

LS(1)	User Commands	LS(1)
<b>NAME</b>	ls - list directory contents	
<b>SYNOPSIS</b>	<b>ls [OPTION]... [FILE]...</b>	
<b>DESCRIPTION</b>	List information about the FILEs (the current directory by default). Sort entries alphabetically if none of <b>-cftuvSUX</b> nor <b>--sort</b> is specified.	
	Mandatory arguments to long options are mandatory for short options too.	
<b>-a, --all</b>	do not ignore entries starting with .	
<b>-A, --almost-all</b>	do not list implied . and ..	
<b>--author</b>	with <b>-l</b> , print the author of each file	
<b>-b, --escape</b>	print C-style escapes for nongraphic characters	

### 4. CD

- To navigate through the Linux files and directories
- Cd ... (to move one directory up)
- Cd ~ (to go straight to the homefolder)
- Cd - (to move to a previous directory)

```
aleena@aleena-VirtualBox:~/Desktop$ cd ..
aleena@aleena-VirtualBox:~$ cd Downloads
aleena@aleena-VirtualBox:~/Downloads$
```

## 5. Ls

- Used to view the content of the directory
- Ls -R (Will list all the files in the sub directory)
- Ls -a (long listing)
- Ls -al (will show hidden files)

```
aleena@aleena-VirtualBox:~/Desktop$ ls  
aleena.pub archive.tar f.txt  
aleena@aleena-VirtualBox:~/Desktop$
```

## 6. Mkdir

- To make a new directory
- Mkdir -p (to create a directory in between two existing directory)

```
aleena@aleena-VirtualBox:~/Desktop$ mkdir aaa  
aleena@aleena-VirtualBox:~/Desktop$ ls  
aaa aleena.pub archive.tar f.txt
```

## 7. Rmdir

- To delete a directory (only allows you to delete empty directories)

```
aleena@aleena-VirtualBox:~/Desktop$ rmdir aaa  
aleena@aleena-VirtualBox:~/Desktop$ ls  
aleena.pub archive.tar f.txt
```

## 8. Touch

- To create a blank new file

```
aleena@aleena-VirtualBox:~/Desktop$ touch file.txt text.txt  
aleena@aleena-VirtualBox:~/Desktop$ ls  
aleena.pub archive.tar file.txt f.txt text.txt
```

## 9. Rm

- To delete directories and the contents within them
- Rm -r (to delete directory)
- Rm filename (to remove a file)

```
aleena@aleena-VirtualBox:~/Desktop$ ls  
aleena.pub archive.tar file.txt f.txt text.txt  
aleena@aleena-VirtualBox:~/Desktop$ rm text.txt  
aleena@aleena-VirtualBox:~/Desktop$ ls  
aleena.pub archive.tar file.txt f.txt
```

## 10. Cat

- List the content of a file
- Cat >filename(create a new file)
- Cat filename1file name2>filename3(join two files and store the output)
- Cat filename | tr a-z A-Z

```
aleena@aleena-VirtualBox:~/Desktop$ cat >sample.txt
hai....
how are you
^C
aleena@aleena-VirtualBox:~/Desktop$ cat sample.txt
hai....
how are you
```

## 1) echo :

- to move some data into a file
- to add a text

```
aleena@aleena-VirtualBox:~/Desktop$ echo hello>>file.txt
aleena@aleena-VirtualBox:~/Desktop$ echo how are you ??..>>file.txt
aleena@aleena-VirtualBox:~/Desktop$ cat file.txt
hello
how are you ??..
```

## 2) head :

- used to view the first lines of any text file
- default it shows 10 lines

```
aleena@aleena-VirtualBox:~/Desktop$ cat >head.txt
aa
bb
cc
dd
ee
ff
^C
aleena@aleena-VirtualBox:~/Desktop$ head -n 3 head.txt
aa
bb
cc
```

## 3) tail :

- will display the last ten lines of a text files

```
aleena@aleena-VirtualBox:~/Desktop$ cat >tail.txt
11
22
33
44
55
66
^C
aleena@aleena-VirtualBox:~/Desktop$ tail -n 3 tail.txt
44
55
66
```

## 4) read :

- read the contents of a line into a variable

```
aleena@aleena-VirtualBox:~/Desktop$ read name
ALEENA
aleena@aleena-VirtualBox:~/Desktop$ echo $name
ALEENA
```

## 5) more :

- displays content of the file. Only difference is that in case of larger files cat command output will scroll off your screen while more command displays output one screenful at a time.
- Enter key : to scroll down page line by line
- Space bar : to go to next page
- b key : to go to the backward page
- /key : to search string

```
aleena@aleena-VirtualBox:~/Desktop$ more /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
```

## 6) Less :

- Automatically adjust with the width and height of terminal window

```
aleena@aleena-VirtualBox:~/Desktop$ less /etc/passwd
```

```
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:103:106::/nonexistent:/usr/sbin/nologin
```

## 7) Cut :

- used for cutting out the section from each lines of files and writing the standard output.
- It can be used to cut parts of a line by byte position character and field

```
aleena@aleena-VirtualBox:~/Desktop$ cat file.txt
hello
how are you ??..
aleena@aleena-VirtualBox:~/Desktop$ cut -b 1,2,3 file.txt
hel
how
```

## 8) paste :

- used to join files horizontally by outputting lines consisting of lines from each file specified, separated by tab as delimiter, to the standard output.

```
aleena@aleena-VirtualBox:~/Desktop$ paste file.txt state.txt
hello
how are you ??..
aleena@aleena-VirtualBox:~/Desktop$
```

## 9) uname :

- will print detailed information about your linux system like machine name, operating system, kernel etc..

```
aleena@aleena-VirtualBox:~/Desktop$ uname
Linux
aleena@aleena-VirtualBox:~/Desktop$ uname -r
5.8.0-55-generic
```

## 10) cp :

- used to copy files from the current directory to a different directory
- cp -i (will ask for user's consent in case of a potential file overwrite.)
- cp -p (will preserve source file mode, ownership and time stamp)
- cp -r (will copy directories recursively)
- cp -u (copies files only if the destination file is not existing or the source file is newer than the destination file)

```
aleena@aleena-VirtualBox:~/Desktop$ cp sample.txt Documents
aleena@aleena-VirtualBox:~/Desktop$
```

## 11) mv :

- to move files
- rename files

```
aleena@aleena-VirtualBox:~/Desktop$ mv file.txt Documents
aleena@aleena-VirtualBox:~/Desktop$
```

## 12) locate :

- to find a file
- locate -i filename (make it case insensitive you can search file if you don't remember its exact name)
- \* ( to search for a file that contains two or more words)

```
aleena@aleena-VirtualBox:~/Desktop$ locate head.txt
```

## 13) Find :

- To search for files or directories
- Find. -name filename (to find files in the current directory)

```
aleena@aleena-VirtualBox:~/Desktop$ find sample.txt
```

## 14) grep :

- Search through all the text in a given file

```
aleena@aleena-VirtualBox:~/Desktop$ grep aa head.txt
```

## 15) Df :

- To get report on the system's disk space usage shows in percentage and kbs

```
aleena@aleena-VirtualBox:~/Desktop$ df -m
Filesystem      1M-blocks  Used Available Use% Mounted on
udev              462      0     462   0% /dev
tmpfs             99      2     97   2% /run
/dev/sda5       9509  8493     514  95% /
tmpfs             491      0     491   0% /dev/shm
tmpfs              5      1      5   1% /run/lock
tmpfs             491      0     491   0% /sys/fs/cgroup
/dev/loop3            1      1      0  100% /snap/bare/5
/dev/loop0            56      56      0  100% /snap/core18/2128
/dev/loop4            219    219      0  100% /snap/gnome-3-34-1804/66
/dev/loop6            33      33      0  100% /snap/snapd/12883
/dev/loop5            51      51      0  100% /snap/snap-store/547
/dev/loop7            33      33      0  100% /snap/snapd/13170
/dev/loop2            56      56      0  100% /snap/core18/2074
/dev/loop10           66      66      0  100% /snap/gtk-common-themes/1515
/dev/loop8            66      66      0  100% /snap/gtk-common-themes/1519
/dev/loop9            51      51      0  100% /snap/snap-store/542
/dev/loop1            219    219      0  100% /snap/gnome-3-34-1804/72
/dev/sda1            511      1     511   1% /boot/efi
tmpfs              99      1      99   1% /run/user/1000
```

## 16) du :

- to check how many space a file or directory takes

```
aleena@aleena-VirtualBox:~/Desktop$ du -h
4.0K  ./f.txt
56K  .
```

## **17) useradd :**

- available only for system admins.
- To create new user

```
aleena@aleena-VirtualBox:~/Desktop$ sudo useradd hima  
[sudo] password for aleena:
```

## **18) Userdel :**

- remove user or delete user account

```
aleena@aleena-VirtualBox:~/Desktop$ sudo userdel hima  
aleena@aleena-VirtualBox:~/Desktop$
```

## **19) sudo :**

- SuperUserDo ,enables you to perform tasks that require administrativeq or root permissions.

```
aleena@aleena-VirtualBox:~/Desktop$ sudo apt update  
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease  
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]  
Get:3 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]  
Get:4 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [101 kB]  
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Metadata [29.0 kB]  
Get:6 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [62.5 kB]  
Get:7 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [2,464 B]  
Get:8 http://in.archive.ubuntu.com/ubuntu focal-updates/main i386 Packages [544 kB]  
30% [8 Packages 170 kB/544 kB 31%] 75.8 kB/s 50s^  
C
```

## **20) passwd :**

- to change passwords for user account.

```
aleena@aleena-VirtualBox:~/Desktop$ passwd  
Changing password for aleena.  
Current password:  
New password:  
Retype new password:  
Password unchanged
```

## 1. usermod

- usermod command is used to change the properties of a user in Linux through the command line

```
aleena@aleena-VirtualBox:~/Desktop$ sudo useradd aleena
useradd: user 'aleena' already exists
aleena@aleena-VirtualBox:~/Desktop$ sudo passwd
New password:
Retype new password:
passwd: password updated successfully
aleena@aleena-VirtualBox:~/Desktop$ █
```

```
aleena@aleena-VirtualBox:~/Desktop$ usermod -u 2000 aleena
usermod: user aleena is currently used by process 765
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 2. groupadd

- groupadd command creates a new group account using the values specified on the command line and the default values from the system.

```
aleena@aleena-VirtualBox:~/Desktop$ sudo groupadd nw
[sudo] password for aleena:
aleena@aleena-VirtualBox:~/Desktop$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,aleena
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:aleena
floppy:x:25:
tape:x:26:
sudo:x:27:aleena
audio:x:29:pulse
dip:x:30:aleena
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
```

## 3. groups –

- print the groups a user is in

```
aleena@aleena-VirtualBox:~/Desktop$ groups
aleena adm cdrom sudo dip plugdev lpadmin lxd sambashare
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 4. groupdel

- groupdel command modifies the system account files, deleting all entries that refer to group. The named group must exist

```
aleena@aleena-VirtualBox:~/Desktop$ sudo groupdel nw
aleena@aleena-VirtualBox:~/Desktop$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,aleena
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:aleena
floppy:x:25:
tape:x:26:
sudo:x:27:aleena
audio:x:29:pulse
dip:x:30:aleena
www-data:x:33:
backup:x:34:
operator:x:37:
list:x:38:
irc:x:39:
src:x:40:
gnats:x:41:
shadow:x:42:
```

## 5.groupmod

- The groupmod command modifies the definition of the specified group by modifying the appropriate entry in the group database.

```
aleena@aleena-VirtualBox:~/Desktop$ sudo groupadd add
aleena@aleena-VirtualBox:~/Desktop$ sudo groupmod -n add1 add
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 6.chmod

- To change directory permissions of file/ Directory in Linux.

```
aleena@aleena-VirtualBox:~/Desktop$ chmod u+x file.txt  
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 7.chown

- The chown command allows you to change the user and/or group ownership of a given file, directory

```
aleena@aleena-VirtualBox:~/Desktop$ chown aleena h.txt  
aleena@aleena-VirtualBox:~/Desktop$ ls -l h.txt  
-rw-rw-r-- 1 aleena aleena 2 Aug 13 16:49 h.txt  
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 8.id

- id command in Linux is used to find out user and group names and numeric ID's (UID or group ID) of the current user.

```
aleena@aleena-VirtualBox:~/Desktop$ id  
uid=1000(aleena) gid=1000(aleena) groups=1000(aleena),4(adm),24(cdrom),27(sudo),30(dip)  
,46(plugdev),120(lpadmin),131(lxd),132(sambashare)  
aleena@aleena-VirtualBox:~/Desktop$
```

## 9. ps

- The ps command, short for Process Status, is a command line utility that is used to display or view information related to the processes running in a Linux system.

```
aleena@aleena-VirtualBox:~/Desktop$ ps -u  
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND  
aleena     800  0.0  0.6 172652  6140 tty2      Ssl+ 15:45   0:00 /usr/lib/gdm3/gdm-x  
aleena     802  0.5  5.1 532312 51292 tty2      Sl+  15:45   0:22 /usr/lib/xorg/Xorg  
aleena     905  0.0  1.3 199428 14024 tty2      Sl+  15:45   0:00 /usr/libexec/gnome-  
aleena    1762  0.0  0.4 19248   4848 pts/0      Ss   16:23   0:00 bash  
aleena    1960  0.0  0.3 20132  3424 pts/0      R+   16:51   0:00 ps -u  
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 10. top

- top command is used to show the Linux processes. It provides a dynamic real-time view of the running system

```
aleena@aleena-VirtualBox:~/Desktop$ top
```

```
top - 16:53:32 up 1:08, 1 user, load average: 0.06, 0.08, 0.06
Tasks: 166 total, 1 running, 165 sleeping, 0 stopped, 0 zombie
%Cpu(s): 2.0 us, 0.3 sy, 0.0 ni, 97.6 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 980.8 total, 136.3 free, 536.0 used, 308.5 buff/cache
MiB Swap: 448.5 total, 406.6 free, 41.9 used. 297.6 avail Mem

      PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
 1094 aleena    20   0 3689716 285864 96508 S  1.0 28.5  0:51.92 gnome-shell
 1974 aleena    20   0  20492   3748  3236 R  0.7  0.4  0:00.42 top
  802 aleena    20   0 532312  51292 32684 S  0.3  5.1  0:23.41 Xorg
 1754 aleena    20   0 822256 49596 38096 S  0.3  4.9  0:08.40 gnome-terminal-
  1 root      20   0 169088 11460  7964 S  0.0  1.1  0:03.94 systemd
  2 root      20   0      0      0      0 S  0.0  0.0  0:00.00 kthreadd
  3 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 rcu_gp
  4 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 rcu_par_gp
  6 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 kworker/0:0H-k+
  9 root      0 -20      0      0      0 I  0.0  0.0  0:00.00 mm_percpu_wq
 10 root     20   0      0      0      0 S  0.0  0.0  0:00.31 ksoftirqd/0
 11 root     20   0      0      0      0 I  0.0  0.0  0:01.24 rcu_sched
 12 root     rt   0      0      0      0 S  0.0  0.0  0:00.11 migration/0
 13 root    -51   0      0      0      0 S  0.0  0.0  0:00.00 idle_inject/0
 14 root     20   0      0      0      0 S  0.0  0.0  0:00.00 cpuhp/0
 15 root     20   0      0      0      0 S  0.0  0.0  0:00.00 kdevtmpfs
 16 root    0 -20      0      0      0 I  0.0  0.0  0:00.00 netns
 17 root     20   0      0      0      0 S  0.0  0.0  0:00.00 rcu_tasks_kthre
 18 root     20   0      0      0      0 S  0.0  0.0  0:00.00 rcu_tasks_rude_
 19 root     20   0      0      0      0 S  0.0  0.0  0:00.00 rcu_tasks_trace
 20 root     20   0      0      0      0 S  0.0  0.0  0:00.00 kauditd
 21 root     20   0      0      0      0 S  0.0  0.0  0:00.00 khungtaskd
 22 root     20   0      0      0      0 S  0.0  0.0  0:00.00 oom_reaper
 23 root    0 -20      0      0      0 I  0.0  0.0  0:00.00 writeback
 24 root     20   0      0      0      0 S  0.0  0.0  0:00.00 kcompactd0
 25 root     25   5      0      0      0 S  0.0  0.0  0:00.00 ksmd
```

## 1. wc

- wc stands for word count.
- Used for counting purpose.
- It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.

```
aleena@aleena-VirtualBox:~/Desktop$ wc -c h.txt
2 h.txt
aleena@aleena-VirtualBox:~/Desktop$
```

## 2. tar

- The Linux ‘tar’stands for tape archive, is used to create Archive and extract the Archive files
- Linux tar command to create compressed or uncompressed Archive files

```
aleena@aleena-VirtualBox:~/Desktop$ tar cf archive.tar h.txt paste.txt
aleena@aleena-VirtualBox:~/Desktop$ ls archive.tar
archive.tar
aleena@aleena-VirtualBox:~/Desktop$
```

### 3. expr

- The expr command evaluates a given expression and displays its corresponding output. It is used for:
- Basic operations like addition, subtraction, multiplication, division, and modulus on integers.
- Evaluating regular expressions, string operations like substring, length of strings etc.

```
aleena@aleena-VirtualBox:~/Desktop$ expr 10 + 2
12
aleena@aleena-VirtualBox:~/Desktop$ █
```

### 4. Redirections & Piping

- A pipe is a form of redirection to send the output of one command/program/process to another command/program/process for further processing.
- Pipe is used to combine two or more commands, the output of one command acts as input to another command, and this command's output may act as input to the next command and so on.

```
aleena@aleena-VirtualBox:~/Desktop$ ls -l | wc -l
8
aleena@aleena-VirtualBox:~/Desktop$ █
```

## 5. ssh-keygen

- Ssh-keygen command to generate a public/private authentication.

```
aleena@aleena-VirtualBox:~/Desktop$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/aleena/.ssh/id_rsa): aleena
aleena already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in aleena
Your public key has been saved in aleena.pub
The key fingerprint is:
SHA256:7grRoPtrlWOUlnKAod1QriSw5q0qm4t8dsdpvuyeVN+I aleena@aleena-VirtualBox
The key's randomart image is:
+---[RSA 3072]---+
|   .. |
| o .o. |
|+.oo+o.o |
|o+o..+= |
|o.....oS . |
| . . .=.o + o |
| .o. .o +. o o . |
| * .o.+..o E |
|=..oo+.+++= |
+---[SHA256]---+
aleena@aleena-VirtualBox:~/Desktop$
```

## Managing Files, Creating Users and Groups Using Command-line tools

1. a. Create six files with name of the form songX.mp3

```
aleena@aleena-VirtualBox:~$ touch song1.mp3
aleena@aleena-VirtualBox:~$ touch song2.mp3
aleena@aleena-VirtualBox:~$ touch song3.mp3
aleena@aleena-VirtualBox:~$ touch song4.mp3
aleena@aleena-VirtualBox:~$ touch song5.mp3
aleena@aleena-VirtualBox:~$ touch song6.mp3
aleena@aleena-VirtualBox:~$ ls
Desktop  Music    song1.mp3  song4.mp3  Templates
Documents Pictures song2.mp3  song5.mp3  trade
Downloads Public   song3.mp3  song6.mp3  Videos
aleena@aleena-VirtualBox:~$ █
```

- b. Create six files with name of the form snapX.mp3

```
aleena@aleena-VirtualBox:~$ touch snap1.mp3
aleena@aleena-VirtualBox:~$ touch snap2.mp3
aleena@aleena-VirtualBox:~$ touch snap3.mp3
aleena@aleena-VirtualBox:~$ touch snap4.mp3
aleena@aleena-VirtualBox:~$ touch snap5.mp3
aleena@aleena-VirtualBox:~$ touch snap6.mp3
aleena@aleena-VirtualBox:~$ ls
Desktop  Music    snap1.mp3  snap4.mp3  song1.mp3  song4.mp3  Templates
Documents Pictures snap2.mp3  snap5.mp3  song2.mp3  song5.mp3  trade
Downloads Public   snap3.mp3  snap6.mp3  song3.mp3  song6.mp3  Videos
aleena@aleena-VirtualBox:~$ █
```

- c. Create six files with name of the form filmX.mp3

```
aleena@aleena-VirtualBox:~$ touch film1.mp3
aleena@aleena-VirtualBox:~$ touch film2.mp3
aleena@aleena-VirtualBox:~$ touch film3.mp3
aleena@aleena-VirtualBox:~$ touch film4.mp3
aleena@aleena-VirtualBox:~$ touch film5.mp3
aleena@aleena-VirtualBox:~$ touch film6.mp3
aleena@aleena-VirtualBox:~$ ls
Desktop  film2.mp3  film6.mp3  snap1.mp3  snap5.mp3  song3.mp3  Templates
Documents film3.mp3  Music     snap2.mp3  snap6.mp3  song4.mp3  trade
Downloads film4.mp3  Pictures   snap3.mp3  song1.mp3  song5.mp3  Videos
film1.mp3  film5.mp3  Public    snap4.mp3  song2.mp3  song6.mp3
aleena@aleena-VirtualBox:~$ █
```

- 2.** From your home directory, move the song files into your music subdirectory, the snapshot files into your pictures subdirectory, and the movie files into videos subdirectory.

```
aleena@aleena-VirtualBox:~$ mv song1.mp3 ./Music/
aleena@aleena-VirtualBox:~$ mv song2.mp3 ./Music/
aleena@aleena-VirtualBox:~$ mv song3.mp3 ./Music/
aleena@aleena-VirtualBox:~$ mv song4.mp3 ./Music/
aleena@aleena-VirtualBox:~$ mv song5.mp3 ./Music/
aleena@aleena-VirtualBox:~$ mv song6.mp3 ./Music/
aleena@aleena-VirtualBox:~$ ls -R Music
Music:
song1.mp3  song2.mp3  song3.mp3  song4.mp3  song5.mp3  song6.mp3
aleena@aleena-VirtualBox:~$ mv snap1.mp3 ./Pictures/
aleena@aleena-VirtualBox:~$ mv snap2.mp3 ./Pictures/
aleena@aleena-VirtualBox:~$ mv snap3.mp3 ./Pictures/
aleena@aleena-VirtualBox:~$ mv snap4.mp3 ./Pictures/
aleena@aleena-VirtualBox:~$ mv snap5.mp3 ./Pictures/
aleena@aleena-VirtualBox:~$ mv snap6.mp3 ./Pictures/
aleena@aleena-VirtualBox:~$ ls -R Pictures
Pictures:
snap1.mp3  snap2.mp3  snap3.mp3  snap4.mp3  snap5.mp3  snap6.mp3
aleena@aleena-VirtualBox:~$ mv film1.mp3 ./Videos/
aleena@aleena-VirtualBox:~$ mv film2.mp3 ./Videos/
aleena@aleena-VirtualBox:~$ mv film3.mp3 ./Videos/
aleena@aleena-VirtualBox:~$ mv film4.mp3 ./Videos/
aleena@aleena-VirtualBox:~$ mv film5.mp3 ./Videos/
aleena@aleena-VirtualBox:~$ mv film6.mp3 ./Videos/
aleena@aleena-VirtualBox:~$ ls -R Videos
Videos:
film1.mp3  film2.mp3  film3.mp3  film4.mp3  film5.mp3  film6.mp3
aleena@aleena-VirtualBox:~$
```

- 3.** In your home directory, create three subdirectories for organizing your files. Call these directories friends, family, and work. Create all three with one command.

```
aleena@aleena-VirtualBox:~$ mkdir {friends,family,work}
aleena@aleena-VirtualBox:~$ ls
Desktop  Downloads  friends  Pictures  Templates  Videos
Documents  family  Music  Public  trade  work
aleena@aleena-VirtualBox:~$
```

- 4.** Copy song files to the friends folder and snap files to family folder.

```
aleena@aleena-VirtualBox:~$ cp friends dir Music/*.mp3
cp: target 'Music/song6.mp3' is not a directory
aleena@aleena-VirtualBox:~$ ls friends
song1.mp3  song2.mp3  song3.mp3  song4.mp3  song5.mp3  song6.mp3
aleena@aleena-VirtualBox:~$ cp Pictures/snap1.mp3 family
aleena@aleena-VirtualBox:~$ cp Pictures/snap2.mp3 family
aleena@aleena-VirtualBox:~$ cp Pictures/snap3.mp3 family
aleena@aleena-VirtualBox:~$ cp Pictures/snap4.mp3 family
aleena@aleena-VirtualBox:~$ cp Pictures/snap5.mp3 family
aleena@aleena-VirtualBox:~$ cp Pictures/snap6.mp3 family
aleena@aleena-VirtualBox:~$ ls family
snap1.mp3  snap2.mp3  snap3.mp3  snap4.mp3  snap5.mp3  snap6.mp3
aleena@aleena-VirtualBox:~$
```

- 5.** Attempt to delete both family and friends projects with a single rmdir command

```
aleena@aleena-VirtualBox:~$ rmdir family friends
rmdir: failed to remove 'family': No such file or directory
rmdir: failed to remove 'friends': No such file or directory
aleena@aleena-VirtualBox:~$
```

6. Use another command that will succeed in deleting both the family and friends folder.

```
aleena@aleena-VirtualBox:~$ rm -r family friends
aleena@aleena-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates trade Videos work
aleena@aleena-VirtualBox:~$
```

7. Redirect a long listing of all home directory files, including hidden, into a file named allfiles.txt. Confirm that the file contains the listing.

```
aleena@aleena-VirtualBox:~$ ls -al
total 88
drwxr-xr-x 17 aleena aleena 4096 Aug 17 16:19 .
drwxr-xr-x  3 root   root   4096 Jun  8 15:30 ..
-rw-rw-r--  1 aleena aleena 1267 Aug 17 16:28 allfiles.txt
-rw-----  1 aleena aleena 2618 Aug 17 14:15 .bash_history
-rw-r--r--  1 aleena aleena 220 Jun  8 15:30 .bash_logout
-rw-r--r--  1 aleena aleena 3771 Jun  8 15:30 .bashrc
drwx----- 13 aleena aleena 4096 Aug 17 14:15 .cache
drwx----- 13 aleena aleena 4096 Aug 13 16:52 .config
drwxr-xr-x  3 aleena aleena 4096 Aug 17 14:44 Desktop
drwxr-xr-x  2 aleena aleena 4096 Jun  8 16:23 Documents
drwxr-xr-x  2 aleena aleena 4096 Jun  8 16:23 Downloads
drwx----- 3 aleena aleena 4096 Jun 14 17:19 .gnupg
drwx----- 3 aleena aleena 4096 Jun  8 16:23 .local
drwxr-xr-x  2 aleena aleena 4096 Aug 17 14:54 Music
drwxr-xr-x  2 aleena aleena 4096 Aug 17 14:56 Pictures
-rw-r--r--  1 aleena aleena 807 Jun  8 15:30 .profile
drwxr-xr-x  2 aleena aleena 4096 Jun  8 16:23 Public
drwx----- 2 aleena aleena 4096 Jun 14 17:18 .ssh
-rw-r--r--  1 aleena aleena     0 Aug 13 16:11 .sudo_as_admin_successful
drwxr-xr-x  2 aleena aleena 4096 Jun  8 16:23 Templates
drwxrwxr-x  3 aleena aleena 4096 Jun 14 17:31 trade
drwxr-xr-x  2 aleena aleena 4096 Aug 17 14:57 Videos
drwxrwxr-x  2 aleena aleena 4096 Aug 17 15:15 work
aleena@aleena-VirtualBox:~$ ls -al >allfiles.txt
aleena@aleena-VirtualBox:~$ ls
allfiles.txt  Documents  Public    trade   work
Desktop      Downloads  Pictures  Templates  Videos
aleena@aleena-VirtualBox:~$
```

8. In the command window, display today's date with day of the week, month, date and year

```
aleena@aleena-VirtualBox:~$ date
Tuesday 17 August 2021 04:21:39 PM IST
```

9. Add the user Juliet

```
aleena@aleena-VirtualBox:~$ sudo useradd juliet
[sudo] password for aleena:
aleena@aleena-VirtualBox:~$ ls -al >allfiles.txt
```

**10.** Confirm that Juliet has been added by examining the /etc/passwd file

```
aleena@aleena-VirtualBox:~$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
systemd-timesync:x:102:104:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
in
messagebus:x:103:106::/nonexistent:/usr/sbin/nologin
syslog:x:104:110::/home/syslog:/usr/sbin/nologin
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
tss:x:106:111:TPM software stack,,,:/var/lib/tpm:/bin/false
uidd:x:107:114::/run/uidd:/usr/sbin/nologin
tcpdump:x:108:115::/nonexistent:/usr/sbin/nologin
avahi-autoipd:x:109:116:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:110:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
rtkit:x:111:117:RealtimeKit,,,:/proc:/usr/sbin/nologin
speech-dispatcher:x:114:29:Speech Dispatcher,,,:/run/speech-dispatcher:/bin/false
avahi:x:115:121:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/usr/sbin/nologin
kernoops:x:116:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
saned:x:117:123::/var/lib/saned:/usr/sbin/nologin
nm-openvpn:x:118:124:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
h
hplip:x:119:7:HPLIP system user,,,:/run/hplip:/bin/false
whoopsie:x:120:125::/nonexistent:/bin/false
colord:x:121:126:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:122:127::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:123:128:PulseAudio daemon,,,:/var/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:124:65534::/run/gnome-initial-setup:/bin/false
gdm:x:125:130:Gnome Display Manager:/var/lib/gdm3:/bin/false
aleena:x:1000:1000:Aleena,,,:/home/aleena:/bin/bash
systemd-coredump:x:999:999:systemd Core Dumper:/:/usr/sbin/nologin
alee:x:1001:1001::/home/alee:/bin/sh
aleeee:x:1002:1002::/home/aleeee:/bin/sh
juliet:x:1003:1005::/home/juliet:/bin/sh
aleena@aleena-VirtualBox:~$
```

**11.** Use the passwd command to initialize Juliet's password

```
aleena@aleena-VirtualBox:~$ sudo passwd juliet
[sudo] password for aleena:
New password:
Retype new password:
passwd: password updated successfully
aleena@aleena-VirtualBox:~$
```

- 12.** Create a supplementary group called Shakespeare with a group id of 30000

```
aleena@aleena-VirtualBox:~$ sudo groupadd -g 30000 Shakespeare
```

- 13.** Create a supplementary group called artists.

```
aleena@aleena-VirtualBox:~$ sudo groupadd -g 40000 Artists
```

- 14.** Confirm that Shakespeare and artists have been added by examining the /etc/group file.

```
aleena@aleena-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,aleena
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
systemd-coredump:x:999:
alee:x:1001:
aleeee:x:1002:
CNN:x:1003:
add1:x:1004:
juliet:x:1005:
Shakespeare:x:30000:
Artists:x:40000:
aleena@aleena-VirtualBox:~$
```

- 15.** Add the Juliet user to the Shakespeare group as a supplementary group.

```
aleena@aleena-VirtualBox:~$ sudo usermod -a -G Shakespeare juliet
aleena@aleena-VirtualBox:~$ groups juliet
juliet : juliet Shakespeare
```

- 16.** Confirm that Juliet has been added using the id command.

```
aleena@aleena-VirtualBox:~$ id juliet
uid=1003(juliet) gid=1005(juliet) groups=1005(juliet),30000(Shakespeare)
aleena@aleena-VirtualBox:~$
```

**17.** Add Romeo and Hamlet to the Shakespeare group

```
aleena@aleena-VirtualBox:~$ sudo useradd Romeo
aleena@aleena-VirtualBox:~$ sudo useradd Hamlet
aleena@aleena-VirtualBox:~$ sudo usermod -G Shakespeare Romeo
aleena@aleena-VirtualBox:~$ id Romeo
uid=1004(Romeo) gid=40001(Romeo) groups=40001(Romeo),30000(Shakespeare)
aleena@aleena-VirtualBox:~$ sudo usermod -G Shakespeare Hamlet
aleena@aleena-VirtualBox:~$ id Hamlet
uid=1005(Hamlet) gid=40002(Hamlet) groups=40002(Hamlet),30000(Shakespeare)
```

**18.** Add Reba, Dolly and Elvis to the artists group

```
aleena@aleena-VirtualBox:~$ sudo useradd Reba
aleena@aleena-VirtualBox:~$ sudo useradd Dolly
aleena@aleena-VirtualBox:~$ sudo useradd Elvis
aleena@aleena-VirtualBox:~$ sudo usermod -G Artists Reba
aleena@aleena-VirtualBox:~$ sudo usermod -G Artists Dolly
aleena@aleena-VirtualBox:~$ sudo usermod -G Artists Elvins
usermod: user 'Elvins' does not exist
aleena@aleena-VirtualBox:~$ sudo usermod -G Artists Elvis
aleena@aleena-VirtualBox:~$ id Reba
uid=1006(Reba) gid=1006(Reba) groups=1006(Reba),40000(Artists)
aleena@aleena-VirtualBox:~$ id Dolly
uid=1007(Dolly) gid=1007(Dolly) groups=1007(Dolly),40000(Artists)
aleena@aleena-VirtualBox:~$ id Elvis
uid=1008(Elvis) gid=1008(Elvis) groups=1008(Elvis),40000(Artists)
```

- 19.** Verify the supplemental group memberships by examining the /etc/group file.

```
aleena@aleena-VirtualBox:~$ cat /etc/group
root:x:0:
daemon:x:1:
bin:x:2:
sys:x:3:
adm:x:4:syslog,aleena
tty:x:5:syslog
disk:x:6:
lp:x:7:
mail:x:8:
news:x:9:
uucp:x:10:
man:x:12:
proxy:x:13:
kmem:x:15:
dialout:x:20:
fax:x:21:
voice:x:22:
cdrom:x:24:aleena

whoopsie:x:125:
colord:x:126:
geoclue:x:127:
pulse:x:128:
pulse-access:x:129:
gdm:x:130:
lxde:x:131:aleena
aleena:x:1000:
sambashare:x:132:aleena
systemd-coredump:x:999:
alee:x:1001:
aleeee:x:1002:
CNN:x:1003:
add1:x:1004:
juliet:x:1005:
Shakespeare:x:30000:juliet,Romeo,Hamlet
Artists:x:40000:Reba,Dolly,Elvis
Romeo:x:40001:
Hamlet:x:40002:
Reba:x:1006:
Dolly:x:1007:
Elvis:x:1008:
```

- 20.** Attempt to remove user Dolly.

```
aleena@aleena-VirtualBox:~$ userdel -r Dolly
userdel: Permission denied.
userdel: cannot lock /etc/passwd; try again later.
aleena@aleena-VirtualBox:~$
```

**1.** TryoutthesenetworkcommandsinWindows aswell as in Linux and perform at least 4 options with each commands: ping route, traceroute, nslookup, ip config, netstate

### ping

```
aleena@aleena-VirtualBox:~/Desktop$ ping www.facebook.com
PING star-mini.c10r.facebook.com (157.240.228.35) 56(84) bytes of data.
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_seq=1 ttl=
50 time=1380 ms
=50 time=270 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_seq=83 ttl=
50 time=1249 ms
^C
--- star-mini.c10r.facebook.com ping statistics ---
93 packets transmitted, 17 received, 81.7204% packet loss, time 94498ms
rtt min/avg/max/mdev = 248.540/948.963/1686.264/447.879 ms, pipe 2
aleena@aleena-VirtualBox:~/Desktop$
```

```
C:\Users\Admin>ping

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
           [-r count] [-s count] [[-j host-list] | [-k host-list]]
           [-w timeout] [-R] [-S srcaddr] [-c compartment] [-p]
           [-4] [-6] target_name

Options:
  -t          Ping the specified host until stopped.
              To see statistics and continue - type Control-Break;
              To stop - type Control-C.
  -a          Resolve addresses to hostnames.
  -n count    Number of echo requests to send.
  -l size     Send buffer size.
  -f          Set Don't Fragment flag in packet (IPv4-only).
  -i TTL      Time To Live.
  -v TOS      Type Of Service (IPv4-only. This setting has been deprecated
              and has no effect on the type of service field in the IP
              Header).
  -r count    Record route for count hops (IPv4-only).
  -s count    Timestamp for count hops (IPv4-only).
  -j host-list Loose source route along host-list (IPv4-only).
  -k host-list Strict source route along host-list (IPv4-only).
  -w timeout   Timeout in milliseconds to wait for each reply.
  -R          Use routing header to test reverse route also (IPv6-only).
              Per RFC 5095 the use of this routing header has been
              deprecated. Some systems may drop echo requests if
              this header is used.
  -S srcaddr   Source address to use.
  -c compartment Routing compartment identifier.
  -p          Ping a Hyper-V Network Virtualization provider address.
  -4          Force using IPv4.
  -6          Force using IPv6.
```

```
C:\Users\Admin>ping /t
IP address must be specified.

C:\Users\Admin>ping /t 8.8.8.8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=153ms TTL=111
Reply from 8.8.8.8: bytes=32 time=251ms TTL=111
Reply from 8.8.8.8: bytes=32 time=162ms TTL=111
Reply from 8.8.8.8: bytes=32 time=89ms TTL=111
Reply from 8.8.8.8: bytes=32 time=80ms TTL=111
Reply from 8.8.8.8: bytes=32 time=79ms TTL=111
Request timed out.
```

## Traceroute

```
aleena@aleena-VirtualBox:~/Desktop$ traceroute www.facebook.com
traceroute to www.facebook.com (157.240.228.35), 30 hops max, 60 byte packets
 1 _gateway (10.0.2.2)  5.036 ms  4.971 ms  4.927 ms
 2 * * *
 3 * * *
 4 * * *
^C
C:\Users\Admin>tracert

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d           Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list   Loose source route along host-list (IPv4-only).
  -w timeout     Wait timeout milliseconds for each reply.
  -R           Trace round-trip path (IPv6-only).
  -S srcaddr    Source address to use (IPv6-only).
  -4           Force using IPv4.
  -6           Force using IPv6.

C:\Users\Admin>tracert -R
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d           Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list   Loose source route along host-list (IPv4-only).
  -w timeout     Wait timeout milliseconds for each reply.
  -R           Trace round-trip path (IPv6-only).
  -S srcaddr    Source address to use (IPv6-only).
  -4           Force using IPv4.
  -6           Force using IPv6.

C:\Users\Admin>tracert -S
A value must be supplied for option -S.

C:\Users\Admin>tracert -D
-D is not a valid command option.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d           Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list   Loose source route along host-list (IPv4-only).
  -w timeout     Wait timeout milliseconds for each reply.
  -R           Trace round-trip path (IPv6-only).
  -S srcaddr    Source address to use (IPv6-only).
  -4           Force using IPv4.
  -6           Force using IPv6.
```

```
C:\Users\Admin>tracert -j
A target name or address must be specified.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d           Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list   Loose source route along host-list (IPv4-only).
  -w timeout     Wait timeout milliseconds for each reply.
  -R           Trace round-trip path (IPv6-only).
  -S srcaddr    Source address to use (IPv6-only).
  -4           Force using IPv4.
  -6           Force using IPv6.

C:\Users\Admin>tracert -W
-W is not a valid command option.

Usage: tracert [-d] [-h maximum_hops] [-j host-list] [-w timeout]
               [-R] [-S srcaddr] [-4] [-6] target_name

Options:
  -d           Do not resolve addresses to hostnames.
  -h maximum_hops Maximum number of hops to search for target.
  -j host-list   Loose source route along host-list (IPv4-only).
  -w timeout     Wait timeout milliseconds for each reply.
  -R           Trace round-trip path (IPv6-only).
  -S srcaddr    Source address to use (IPv6-only).
  -4           Force using IPv4.
  -6           Force using IPv6.
```

## Nslookup

```
aleena@aleena-VirtualBox:~/Desktop$ nslookup google.com
Server:      127.0.0.53
Address:     127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.77.110
Name:   google.com
Address: 2404:6800:4007:81d::200e

aleena@aleena-VirtualBox:~/Desktop$
```

```
C:\Users\Admin>nslookup
DNS request timed out.
    timeout was 2 seconds.
Default Server: UnKnown
Address: 192.168.100.64

>
C:\Users\Admin>nslookup google.com
Server: UnKnown
Address: 192.168.100.64

Non-authoritative answer:
Name:   google.com
Addresses: 2404:6800:4007:81e::200e
          142.250.183.238
```

## Netstat

```
aleena@aleena-VirtualBox:~/Desktop$ netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0  localhost:mysql          0.0.0.0:*
                                         LISTEN
tcp      0      0  localhost:domain        0.0.0.0:*
                                         LISTEN
tcp      0      0  localhost:ipp          0.0.0.0:*
                                         LISTEN
tcp6     0      0  ::1:80                 ::*:*
                                         LISTEN
tcp6     0      0  ::1:3306              ::*:*
                                         LISTEN
tcp6     0      0  ::1:53                ::*:*
                                         LISTEN
tcp6     0      0  ::1:631               ::*:*
                                         LISTEN
tcp6     0      0  ::1:mdns              ::*:*
                                         LISTEN
udp      0      0  0.0.0.0:39914        0.0.0.0:*
                                         LISTEN
udp      0      0  localhost:domain        0.0.0.0:*
                                         LISTEN
udp      0      0  0.0.0.0:35953        0.0.0.0:*
                                         LISTEN
udp      0      0  0.0.0.0:631          0.0.0.0:*
                                         LISTEN
udp      0      0  0.0.0.0:mdns         0.0.0.0:*
                                         LISTEN
udp6     0      0  ::1:mdns             ::*:*
                                         LISTEN
raw6    0      0  ::1:ipv6-icmp        ::*:*
                                         7
Active UNIX domain sockets (only servers)
Proto RefCnt Flags       Type            State           I-Node Path
unix    2      [ ACC ]   STREAM           LISTENING      29545  @/home/aleena/.cache/ibus/db
us-RirubkMF
unix    2      [ ACC ]   STREAM           LISTENING      28909  @/tmp/.ICE-unix/1215
unix    2      [ ACC ]   SEQPACKET        LISTENING      15171  /run/udev/control
unix    2      [ ACC ]   STREAM           LISTENING      27353  /tmp/.X11-unix/X0
unix    2      [ ACC ]   STREAM           LISTENING      15144  /run/systemd/private
unix    2      [ ACC ]   STREAM           LISTENING      15146  /run/systemd/userdb/io.syst
md.DynamicUser
unix    2      [ ACC ]   STREAM           LISTENING      28910  /tmp/.ICE-unix/1215
unix    2      [ ACC ]   STREAM           LISTENING      26618  /run/user/1000/systemd/priva
te
unix    2      [ ACC ]   STREAM           LISTENING      26634  /run/user/1000/bus
unix    2      [ ACC ]   STREAM           LISTENING      15157  /run/systemd/fsck.progress
```

C:\Users\Admin>NetStat

### Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:49673	activate:49674	ESTABLISHED
TCP	127.0.0.1:49674	activate:49673	ESTABLISHED
TCP	127.0.0.1:49675	activate:49676	ESTABLISHED
TCP	127.0.0.1:49676	activate:49675	ESTABLISHED
TCP	192.168.100.28:62139	20.198.162.76:https	ESTABLISHED

<sup>^C</sup>

C:\Users\Admin>netstat -n

### Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:49673	127.0.0.1:49674	ESTABLISHED
TCP	127.0.0.1:49674	127.0.0.1:49673	ESTABLISHED
TCP	127.0.0.1:49675	127.0.0.1:49676	ESTABLISHED
TCP	127.0.0.1:49676	127.0.0.1:49675	ESTABLISHED
TCP	192.168.100.28:62139	20.198.162.76:443	ESTABLISHED
TCP	192.168.100.28:62339	52.109.124.18:443	ESTABLISHED
TCP	[2409:4073:200f:fd43:80fe:8094:94a1:d813]:62352	[2603:1046:700:70::2]:443	ESTABLISHED
TCP	[fe80::8484:6278:3f18:b08fx%8]:1521	[fe80::8484:6278:3f18:b08fx%8]:49677	ESTABLISHED
TCP	[fe80::8484:6278:3f18:b08fx%8]:49677	[fe80::8484:6278:3f18:b08fx%8]:1521	ESTABLISHED

C:\Users\Admin>netstat -n 5

### Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:49673	127.0.0.1:49674	ESTABLISHED
TCP	127.0.0.1:49674	127.0.0.1:49673	ESTABLISHED
TCP	127.0.0.1:49675	127.0.0.1:49676	ESTABLISHED
TCP	127.0.0.1:49676	127.0.0.1:49675	ESTABLISHED
TCP	192.168.100.28:62139	20.198.162.76:443	ESTABLISHED
TCP	192.168.100.28:62339	52.109.124.18:443	ESTABLISHED
TCP	[2409:4073:200f:fd43:80fe:8094:94a1:d813]:62352	[2603:1046:700:70::2]:443	ESTABLISHED
TCP	[fe80::8484:6278:3f18:b08fx%8]:1521	[fe80::8484:6278:3f18:b08fx%8]:49677	ESTABLISHED
TCP	[fe80::8484:6278:3f18:b08fx%8]:49677	[fe80::8484:6278:3f18:b08fx%8]:1521	ESTABLISHED

<sup>^C</sup>

```
C:\Users\Admin>netstat -a
Active Connections

  Proto  Local Address          Foreign Address        State
  TCP    0.0.0.0:135             LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:445             LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:1521            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:3306            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:5040            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:8080            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:33060            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49664            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49665            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49666            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49667            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49668            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49671            LAPTOP-QL605AD8:0  LISTENING
  TCP    0.0.0.0:49678            LAPTOP-QL605AD8:0  LISTENING
  TCP    127.0.0.1:5939           LAPTOP-QL605AD8:0  LISTENING
  TCP    127.0.0.1:49679           LAPTOP-QL605AD8:0  LISTENING
  TCP    127.0.0.1:49673           activate:49674   ESTABLISHED
  TCP    127.0.0.1:49674           activate:49673   ESTABLISHED
  TCP    127.0.0.1:49674           activate:49674   ESTABLISHED
  TCP    127.0.0.1:49675           activate:49676   ESTABLISHED
  TCP    127.0.0.1:49676           activate:49675   ESTABLISHED
  TCP    192.168.56.1:139          LAPTOP-QL605AD8:0  LISTENING
  TCP    192.168.100.28:62139      LAPTOP-QL605AD8:0  LISTENING
  TCP    192.168.100.28:62339      20.198.162.76:https ESTABLISHED
  TCP    [::]:135                 LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:445                 LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:1521                LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:3306                LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:8080                LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:33060               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49664               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49665               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49666               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49667               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49668               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49671               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49678               LAPTOP-QL605AD8:0  LISTENING
  TCP    [::]:49669               LAPTOP-QL605AD8:0  LISTENING
  TCP    [2409:4073:200f:fd43:80fe:8094:94a1:d813]:62352 [2603:1046:700:70::2]:https ESTABLISHED
  TCP    [fe80:8:8484:6278:3f18:b00f%8]:1521 LAPTOP-QL605AD8:49677 ESTABLISHED
  TCP    [fe80:8:8484:6278:3f18:b00f%8]:49677 LAPTOP-QL605AD8:1521 ESTABLISHED

  UDP  0.0.0.0:5000              *:*
  UDP  0.0.0.0:4500              *:*
  UDP  0.0.0.0:5050              *:*
  UDP  0.0.0.0:5353              *:*
  UDP  0.0.0.0:5355              *:*
  UDP  0.0.0.0:51851             *:*
  UDP  0.0.0.0:51852             *:*
  UDP  0.0.0.0:51853             *:*
  UDP  0.0.0.0:54373             *:*
```

## route

```
aleena@aleena-VirtualBox:~/Desktop$ sudo route
Kernel IP routing table
Destination     Gateway         Genmask         Flags Metric Ref  Use Iface
default         _gateway       0.0.0.0         UG    100    0      0 enp0s3
10.0.2.0        0.0.0.0        255.255.255.0  U     100    0      0 enp0s3
link-local      0.0.0.0        255.255.0.0   U     1000   0      0 enp0s3

C:\Users\Admin>route
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination] [MASK netmask] [gateway] [METRIC metric] [IF interface]
  -f      Clears the routing tables of all gateway entries. If this is used in conjunction with one of the commands, the tables are cleared prior to running the command.
  -p      When used with the ADD command, makes a route persistent across boots of the system. By default, routes are not preserved when the system is restarted. Ignored for all other commands, which always affect the appropriate persistent routes.
  -4      Force using IPv4.
  -6      Force using IPv6.
command      One of these:
            PRINT   Prints a route
            ADD    Adds a route
            DELETE Deletes a route
            CHANGE Modifies an existing route
destination   Specifies the 'cost'.
MASK         Specifies that the next parameter is the 'netmask' value.
netmask      Specifies a subnet mask value for this route entry.
            If not specified, it defaults to 255.255.255.255.
gateway      Specifies gateway.
interface    the interface number for the specified route.
METRIC       specifies the metric, i.e. cost for the destination.

All symbolic names used for destination are looked up in the network database file NETWORKS. The symbolic names for gateway are looked up in the host name database file HOSTS.

If the command is PRINT or DELETE, Destination or gateway can be a wildcard, (wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only matching destination routes are printed. The * matches any string, and ? matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.
Diagnostic Notes:
  Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
  Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
            The route addition failed: The specified mask parameter is invalid. (Destination & Mask) != Destination.

Examples:
  > route PRINT
  > route PRINT -4
  > route PRINT -6
  > route PRINT 157*           .... Only prints those matching 157*
  > route ADD 157.0.0.0 MASK 255.0.0.0 157.55.80.1 METRIC 3 IF 2
```

```
C:\Users\Admin>route -cn
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
      [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f      Clears the routing tables of all gateway entries. If this is
used in conjunction with one of the commands, the tables are
cleared prior to running the command.

-p      When used with the ADD command, makes a route persistent across
boots of the system. By default, routes are not preserved
when the system is restarted. Ignored for all other commands,
which always affect the appropriate persistent routes.

-4      Force using IPv4.

-6      Force using IPv6.

command  One of these:
         PRINT    Prints a route
         ADD     Adds a route
         DELETE   Deletes a route
         CHANGE   Modifies an existing route

destination Specifies the host.
MASK       Specifies that the next parameter is the 'netmask' value.
netmask    Specifies a subnet mask value for this route entry.
           If not specified, it defaults to 255.255.255.255.
gateway   Specifies gateway.
interface  the interface number for the specified route.
METRIC    specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE. Destination or gateway can be a wildcard,
(wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.

Diagnostic Notes:
  Invalid MASK generates an error, that is when (DEST & MASK) != DEST.
  Example> route ADD 157.0.0.0 MASK 155.0.0.0 157.55.80.1 IF 1
            The route addition failed: The specified mask parameter is invalid. (Destination & Mask) != Destination.

Examples:
> route PRINT
> route PRINT -4
> route PRINT -6
> route PRINT 157*      .... Only prints those matching 157*
> route ADD 157.0.0.0 MASK 255.0.0.0 157.55.80.1 METRIC 3 IF 2
      destination^      ^mask        ^gateway      metric^      ^
                           ^           ^           ^           ^
                           Interface^
   IF IF is not given, it tries to find the best interface for a given
   gateway.
> route ADD 3ffe::/32 3ffe::1
```

```
C:\Users\Admin>route -n
Manipulates network routing tables.

ROUTE [-f] [-p] [-4|-6] command [destination]
      [MASK netmask] [gateway] [METRIC metric] [IF interface]

-f      Clears the routing tables of all gateway entries. If this is
used in conjunction with one of the commands, the tables are
cleared prior to running the command.

-p      When used with the ADD command, makes a route persistent across
boots of the system. By default, routes are not preserved
when the system is restarted. Ignored for all other commands,
which always affect the appropriate persistent routes.

-4      Force using IPv4.

-6      Force using IPv6.

command  One of these:
         PRINT    Prints a route
         ADD     Adds a route
         DELETE   Deletes a route
         CHANGE   Modifies an existing route

destination Specifies the host.
MASK       Specifies that the next parameter is the 'netmask' value.
netmask    Specifies a subnet mask value for this route entry.
           If not specified, it defaults to 255.255.255.255.
gateway   Specifies gateway.
interface  the interface number for the specified route.
METRIC    specifies the metric, ie. cost for the destination.

All symbolic names used for destination are looked up in the network database
file NETWORKS. The symbolic names for gateway are looked up in the host name
database file HOSTS.

If the command is PRINT or DELETE, Destination or gateway can be a wildcard,
(wildcard is specified as a star '*'), or the gateway argument may be omitted.

If Dest contains a * or ?, it is treated as a shell pattern, and only
matching destination routes are printed. The '*' matches any string,
and '?' matches any one char. Examples: 157.*.1, 157.*, 127.*, *224*.

Pattern match is only allowed in PRINT command.

Diagnostic Notes:
```

## Sudo ifconfig

```
aleena@aleena-VirtualBox:~/Desktop$ sudo ifconfig
enp0s3: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
      inet 10.0.2.15 netmask 255.255.255.0 broadcast 10.0.2.255
      inet6 fe80::ff6:96d5:9484:9bfb prefixlen 64 scopeid 0x20<link>
        ether 08:00:27:a5:2b:8a txqueuelen 1000 (Ethernet)
          RX packets 442 bytes 301523 (301.5 KB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 643 bytes 69224 (69.2 KB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
      inet 127.0.0.1 netmask 255.0.0.0
      inet6 ::1 prefixlen 128 scopeid 0x10<host>
        loop txqueuelen 1000 (Local Loopback)
          RX packets 2014 bytes 150290 (150.2 KB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 2014 bytes 150290 (150.2 KB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

```
aleena@aleena-VirtualBox:~/Desktop$ ipconfig
C:\Users\Admin>IPConfig

Windows IP Configuration

Ethernet adapter Ethernet:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . .

Ethernet adapter VirtualBox Host-Only Network:

  Connection-specific DNS Suffix . .
  Link-local IPv6 Address . . . . . : fe80::8484:6278:3f18:b08f%8
  IPv4 Address. . . . . : 192.168.56.1
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . :

Wireless LAN adapter Local Area Connection* 1:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . .

Wireless LAN adapter Local Area Connection* 2:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . .

Wireless LAN adapter Wi-Fi:

  Connection-specific DNS Suffix . .
  IPv6 Address. . . . . : 2409:4073:200f:fd43:c98e:b07:7b92:ebd9
  Temporary IPv6 Address. . . . . : 2409:4073:200f:fd43:80fe:8094:94a1:d813
  Link-local IPv6 Address . . . . . : fe80::c98e:b07:7b92:ebd9%18
  IPv4 Address. . . . . : 192.168.100.28
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : fe80::9c1f:7ff:fe0a:164c%18
                                192.168.100.64

Ethernet adapter Bluetooth Network Connection:

  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . .
```

```
C:\Users\Admin>ipconfig/all
Windows IP Configuration

Host Name . . . . . : LAPTOP-QL6054DB
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled . . . . . : No
WINS Proxy Enabled . . . . . : No

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Realtek PCIe GBE Family Controller
    Physical Address . . . . . : 08-84-6A-71-9A-79
    DHCP Enabled . . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes

Ethernet adapter VirtualBox Host-Only Network:

    Connection-specific DNS Suffix . . . . . : VirtualBox Host-Only Ethernet Adapter
    Description . . . . . : VirtualBox Host-Only Ethernet Adapter
    Physical Address . . . . . : 08-00-27-00-00-00
    DHCP Enabled . . . . . : No
    Autoconfiguration Enabled . . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::8484:6278%3(Forever)
    IPv4 Address . . . . . : 192.168.56.1(PREFERRED)
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . :
    DHCPv6 TAID . . . . . : 00000000000000000000000000000000
    DHCPv6 Client DUID . . . . . : 00-01-00-01-24-06-62-05-F8-84-6A-71-9A-79
    DNS Servers . . . . . : fe00::ffff::1#1
                           fe00::ffff::2#1
                           fe00::ffff::3#1
    NetBIOS over Tcpip . . . . . :

Wireless LAN adapter Local Area Connection 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
    Physical Address . . . . . : 80-91-33-69-52-1D
    DHCP Enabled . . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Local Area Connection 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #
    Physical Address . . . . . : 80-91-33-69-52-1D
    DHCP Enabled . . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Wi-Fi:
```

## 2. Identify and perform 5 more commands and it's working

### Linux

### Ls

```
aleena@aleena-VirtualBox:~/Desktop$ ls
aleena      file.txt   film4.mp3  h.txt      snap2.mp3  snap6.mp3  song4.mp3
aleena.pub   film1.mp3  film5.mp3  name.txt   snap3.mp3  song1.mp3  song5.mp3
aleena.txt   film2.mp3  film6.mp3  paste.txt  snap4.mp3  song2.mp3  song6.mp3
archive.tar  film3.mp3  f.txt     snap1.mp3  snap5.mp3  song3.mp3
```

### Cat

```
aleena@aleena-VirtualBox:~/Desktop$ cp aleena.txt paste.txt
aleena@aleena-VirtualBox:~/Desktop$ cat paste.txt
hi
i am aleena
hai hello
hai
how are you
aleena@aleena-VirtualBox:~/Desktop$
```

## echo

```
aleena@aleena-VirtualBox:~/Desktop$ echo -e "linux command.\n for beginners
> "
linux command.
for beginners
```

## History

```
aleena@aleena-VirtualBox:~/Desktop$ history
 1  pwd
 2  man
 3  man pwd
 4  pwd
 5  history
 6  pwd
 7  man man
 8  cd
 9  cd ..
10 cd -
11 ls
12 ls -l
13 ls -ol
14 ls -R
15 ls -t
16 ls -r
17 mkdir abcd
18 ls
19 mkdir -p trade/trade1
20 ls
21 rmdir abcd
22 ls
23 touch new.txt
24 ls
25 rm new.txt
26 ls
27 rm -r
28 cat
29 man pwd
30 man history

30 man history
31 man cd
32 man cd ..
33 name="aleena"
34 echo $name
35 clear
36 echo hi>>aleena.txt
37 echo i am aleena>>aleena.txt
38 echo hal hello>>aleena.txt
39 cat aleena.txt
40 head aleena.txt
41 head -n2 aleena.txt
42 clear
43 ls
44 tail aleena.txt
45 tail -f aleena.txt
46 cut -b 1,2 aleena.txt
47 clear
48 cat paste.txt
49 mk paste.txt
50 echo hi>>paste.txt
51 ls
52 clear
53 cat paste.txt
54 paste aleena.txt paste.txt
55 clear
56 userdel -h
57 clear
58 sudo -v
59 echo aleena joseph
60 name="aleena"
61 echo $name
62 clea
```

## Wc

```
aleena@aleena-VirtualBox:~/Desktop$ cat paste.txt
hi
i am aleena
hai hello
hai
how are you
aleena@aleena-VirtualBox:~/Desktop$ wc -l paste.txt
5 paste.txt
```

## Windows

### cd

```
C:\Users>cd
C:\Users

C:\Users>cd ..
C:\>
```

### cipher

```
C:\>cipher

Listing C:\

New files added to this directory will not be encrypted.

U hpswsetup
U Intel
U java
U javalab
U kingsoft
U KMPlayer
U mongo
U Nekmit Free Website Template from OS Templates
U oracleexe
U PerfLogs
U Program Files
U Program Files (x86)
U TurboC3
U Users
U wamp
U Windows
```

## driverquery

Module Name	Display Name	Description	Driver Type	Start Mode	State	Status	Accept Stop	Accept Pause	Paged Pool(bytes)	Code(bytes)	BSS(bytes)	Link Date	Path
===== ======													
1394hc1	1394 OHCI Compliant	1394 OHCI Compliant	Kernel	Manual	Stopped	OK	FALSE	FALSE	4,096	2,29,376	0	C:\Windows\system32\drivers\1394hc1.sys	
3ware	3ware	3ware	Kernel	Manual	Stopped	OK	FALSE	FALSE	0	81,926	0	19-05-2015 03:58:03 AM C:\Windows\system32\drivers\3ware.sys	
ACPI	Microsoft ACPI Driver	Microsoft ACPI Driver	Kernel	Boot	Running	OK	TRUE	FALSE	1,76,128	4,42,368	0	C:\Windows\system32\drivers\ACPI.sys	
AcpiDev	ACPI Devices driver	ACPI Devices driver	Kernel	Manual	Stopped	OK	FALSE	FALSE	8,192	8,192	0	C:\Windows\system32\drivers\AcpiDev.sys	
AcpiEx	Microsoft ACPIEx Drive	Microsoft ACPIEx Drive	Kernel	Boot	Running	OK	TRUE	FALSE	40,096	65,536	0	C:\Windows\system32\Drivers\acpix.sys	
acpiPAGE	ALPI Processor Aggregate	ALPI Processor Aggregate	Kernel	Manual	Running	OK	TRUE	FALSE	4,096	4,096	0	L:\Windows\system32\drivers\acpiPAGE.sys	
AcpiPMI	ACPI Power Meter Drive	ACPI Power Meter Drive	Kernel	Manual	Stopped	OK	FALSE	FALSE	8,192	4,096	0	C:\Windows\system32\drivers\acpiPMI.sys	
acptime	ACPI Wake Alarm Driver	ACPI Wake Alarm Driver	Kernel	Manual	Running	OK	TRUE	FALSE	8,192	4,096	0	C:\Windows\system32\drivers\acptime.sys	
Acx01000	Acx01000	Acx01000	Kernel	Manual	Stopped	OK	FALSE	FALSE	2,17,088	77,824	0	C:\Windows\system32\drivers\Acx01000.sys	
ADP08XX	ADP08XX	ADP08XX	Kernel	Manual	Stopped	OK	FALSE	FALSE	0	11,01,824	0	19-04-2015 02:19:48 AM C:\Windows\system32\drivers\ADP08XX.SYS	
AfD	Ancillary Function Dri	Ancillary Function Dri	Kernel	System	Running	OK	TRUE	FALSE	3,56,352	1,14,688	0	L:\Windows\system32\drivers\afd.sys	
afunix	aFunix	aFunix	Kernel	System	Running	OK	TRUE	FALSE	24,576	8,192	0	C:\Windows\system32\drivers\afunix.sys	
ahcache	Application Compatibil	Application Compatibil	Kernel	System	Running	OK	TRUE	FALSE	1,08,224	20,496	0	C:\Windows\system32\DRIVERS\ahcache.sys	

## echo

```
C:\Users\Admin>echo google.com
google.com

C:\Users\Admin>
```

## powercfg

```
C:\>powercfg
Invalid Parameters -- try "/?" for help

C:\>powercfg /a
The following sleep states are available on this system:
  Standby (S3)
  Hibernate
  Hybrid Sleep
  Fast Startup

The following sleep states are not available on this system:
  Standby (S1)
    The system firmware does not support this standby state.

  Standby (S2)
    The system firmware does not support this standby state.

  Standby (S0 Low Power Idle)
    The system firmware does not support this standby state.
```

## LAMP INSTALLATION

### Install Apache

- Update your system  
sudo apt update

- Install Apache using apt:

```
sudo apt install apache2
```

- Confirm that Apache is now running with the following command:

```
sudo systemctl status apache2
```

- if it is not working

```
sudo systemctl start apache2
```

```
aleena@aleena-VirtualBox:~/Desktop$ sudo systemctl status apache2
[sudo] password for aleena:
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor pres>
   Active: active (running) since Wed 2021-09-29 20:20:52 IST; 2min 58s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Process: 635 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SU>
 Main PID: 814 (apache2)
    Tasks: 6 (limit: 1107)
   Memory: 10.8M
      CPU: 0.000 CPU(s) @ 2.40GHz
     CGroup: /system.slice/apache2.service
             └─814 /usr/sbin/apache2 -k start
                 ├─923 /usr/sbin/apache2 -k start
                 ├─924 /usr/sbin/apache2 -k start
                 ├─925 /usr/sbin/apache2 -k start
                 ├─926 /usr/sbin/apache2 -k start
                 └─929 /usr/sbin/apache2 -k start

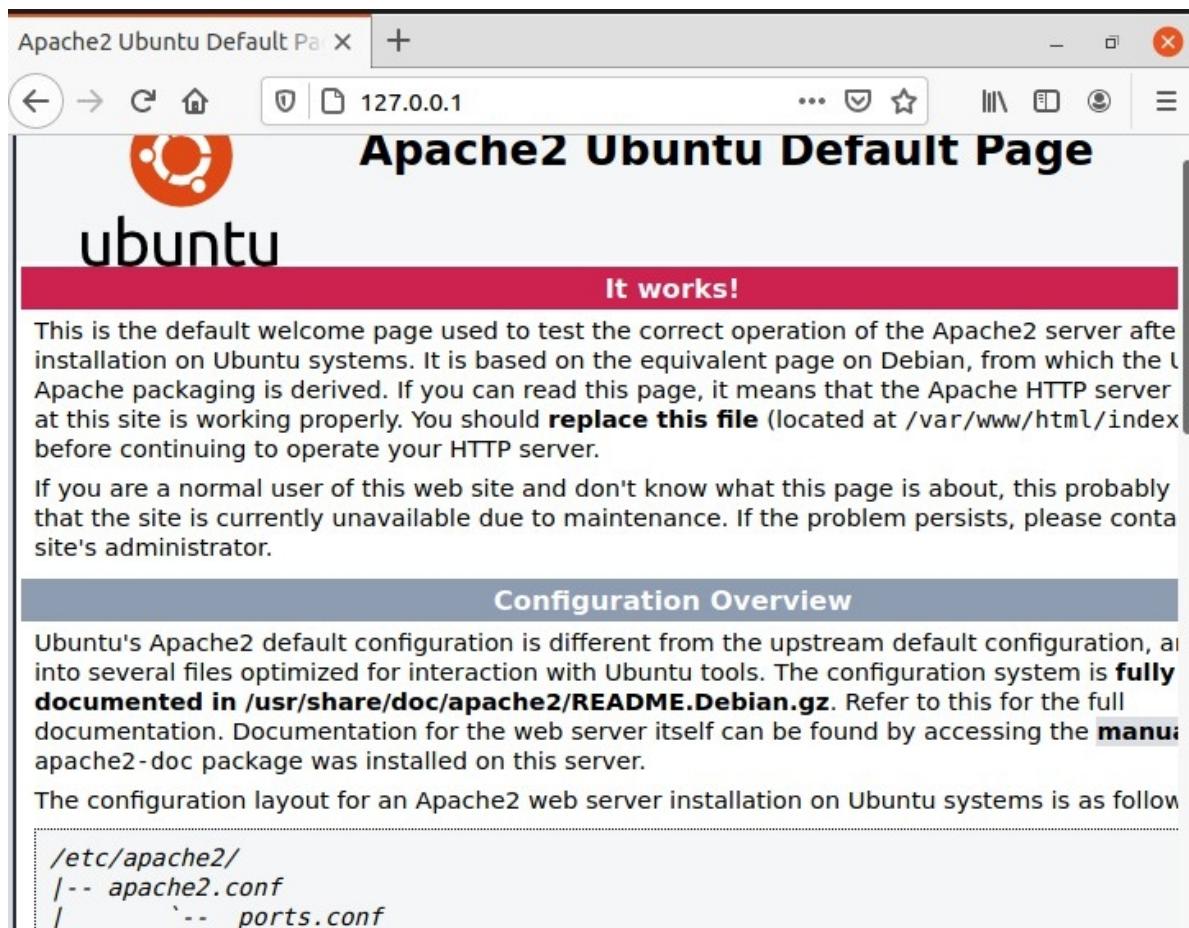
Sep 29 20:20:46 aleena-VirtualBox systemd[1]: Starting The Apache HTTP Server.>
Sep 29 20:20:52 aleena-VirtualBox apachectl[667]: AH00558: apache2: Could not >
Sep 29 20:20:52 aleena-VirtualBox systemd[1]: Started The Apache HTTP Server.

aleena@aleena-VirtualBox:~/Desktop$ █
```

- Once installed, test by accessing your server's IP in your browser:

`http://youripaddress`

( find out your ip address using ifconfig)



Ubuntu's Apache2 default configuration is different from the upstream default configuration, and is split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in /usr/share/doc/apache2/README.Debian.gz**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manpage** for apache2-doc package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```
/etc/apache2/  
|-- apache2.conf  
|   '-- ports.conf
```

## Install mariDB

- sudo apt install mariadb-server mariadb-clientCheck mariadb

### Installation

- sudo systemctl status mysql

(if it is not working sudsystemctl start mysql )

```
aleena@aleena-VirtualBox:~/Desktop$ sudo systemctl status mysql
● mariadb.service - MariaDB 10.3.31 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor pres>
   Active: active (running) since Wed 2021-09-29 20:20:56 IST; 6min ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 636 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var>
   Process: 644 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_ST>
   Process: 646 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && >
   Process: 893 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_S>
   Process: 895 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/>
 Main PID: 717 (mysqld)
   Status: "Taking your SQL requests now..."
   Tasks: 30 (limit: 1107)
  Memory: 27.1M
    CGroup: /system.slice/mariadb.service
            └─717 /usr/sbin/mysqld

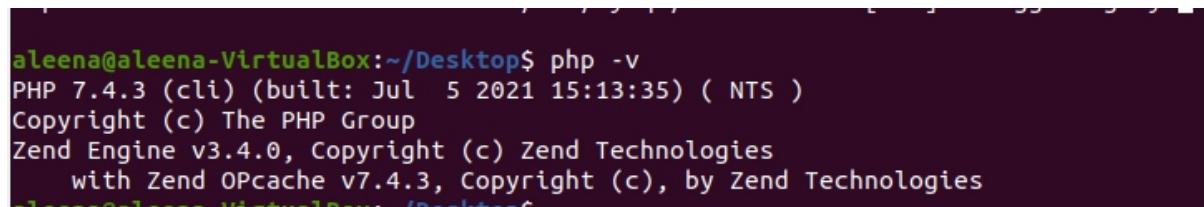
Sep 29 20:20:46 aleena-VirtualBox systemd[1]: Starting MariaDB 10.3.31 database...
Sep 29 20:20:51 aleena-VirtualBox mysqld[717]: 2021-09-29 20:20:51 0 [Note] /u>
Sep 29 20:20:56 aleena-VirtualBox systemd[1]: Started MariaDB 10.3.31 database...
Sep 29 20:20:56 aleena-VirtualBox /etc/mysql/debian-start[897]: Upgrading MySQL...
Sep 29 20:20:58 aleena-VirtualBox /etc/mysql/debian-start[900]: Looking for 'm...
Sep 29 20:20:58 aleena-VirtualBox /etc/mysql/debian-start[900]: Looking for 'm...
Sep 29 20:20:58 aleena-VirtualBox /etc/mysql/debian-start[900]: This installat...
Sep 29 20:20:58 aleena-VirtualBox /etc/mysql/debian-start[914]: Checking for i...
Sep 29 20:20:58 aleena-VirtualBox /etc/mysql/debian-start[918]: Triggering myi...
```

### Install PHP and commonly used modules

- sudo apt install php libapache2-mod-php php-ocache php-gd php-curl php-mysql
- Restart apache2
- sudo systemctl restart apache2

Now you can check php installation

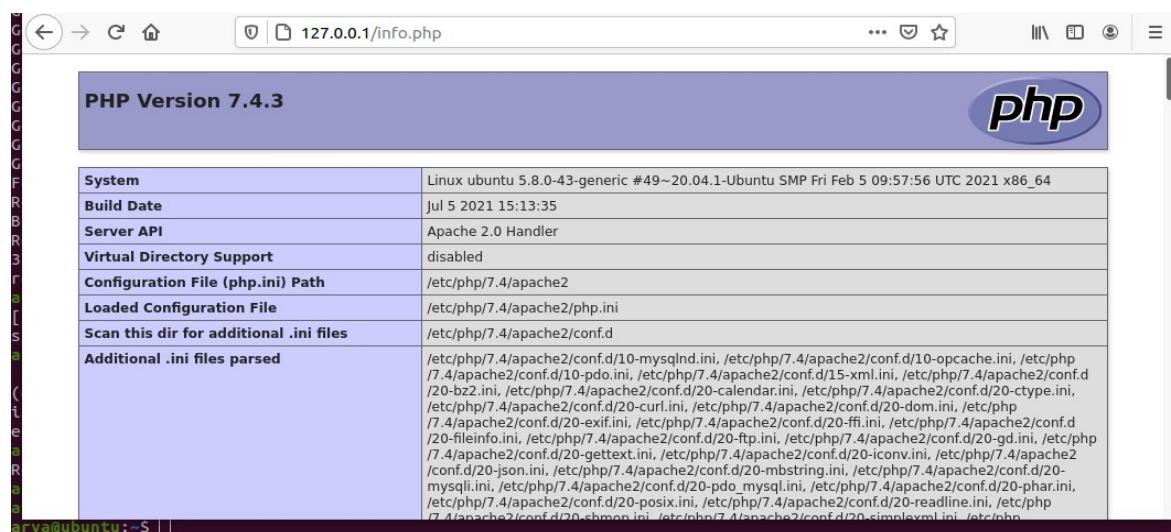
```
Sudo echo "<?php  phpinfo();?>" | sudo tee -a  
/var/www/html/phpinfo.php > /dev/null
```



```
aleena@aleena-VirtualBox:~/Desktop$ php -v  
PHP 7.4.3 (cli) (built: Jul 5 2021 15:13:35) ( NTS )  
Copyright (c) The PHP Group  
Zend Engine v3.4.0, Copyright (c) Zend Technologies  
    with Zend OPcache v7.4.3, Copyright (c), by Zend Technologies
```

Open a browser

<http://127.0.0.1/phpinfo.php>



### Install phpmyadmin

- sudo apt install phpmyadmin php-mbstring php-zip php-gd json php-curl

(It asks for webserver select apache2, select db-configuration and set password)

Restart apache2

- sudo systemctl restart apache2

```
aleena@aleena-VirtualBox:~/Desktop$ sudo mysql -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 37
Server version: 10.3.31-MariaDB-0ubuntu0.20.04.1 Ubuntu 20.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

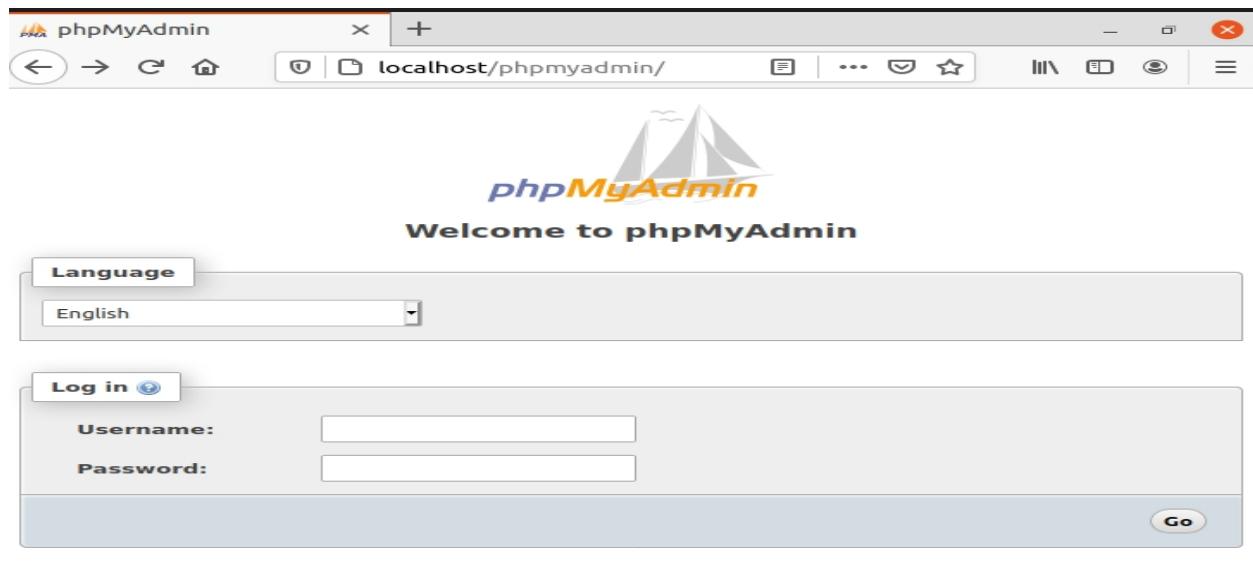
MariaDB [(none)]> show databases;
+-----+
| Database      |
+-----+
| information_schema |
| mysql          |
| performance_schema |
| phpmyadmin     |
+-----+
4 rows in set (0.539 sec)
```

### **Check phpmyadmin**

Open a browser <http://localhost/phpmyadmin>

username : root

password : yourpassword



The screenshot shows the 'Databases' section of phpMyAdmin. The left sidebar lists databases: 'information\_schema', 'mysql', 'performance\_schema', and 'phpmyadmin'. The main area shows a table of databases:

Database	Collation	Action
information_schema	utf8_general_ci	<input type="button" value="Check privileges"/>
mysql	utf8mb4_general_ci	<input type="button" value="Check privileges"/>
performance_schema	utf8_general_ci	<input type="button" value="Check privileges"/>
phpmyadmin	utf8mb4_general_ci	<input type="button" value="Check privileges"/>
<b>Total: 4</b>	<b>utf8mb4_general_ci</b>	

At the bottom, there are buttons for 'Check all' and 'With selected: Drop'.

## Ansible Installation

```
a literal. Did you mean "=="?
  if x is 0 or x is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:34: SyntaxWarning: "is" with
  a literal. Did you mean "=="?
    elif y is 0 or y is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:34: SyntaxWarning: "is" with
  a literal. Did you mean "=="?
    elif y is 0 or y is 1:
/usr/lib/python3/dist-packages/jmespath/visitor.py:260: SyntaxWarning: "is" wit
h a literal. Did you mean "=="?
    if original_result is 0:
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ieee-data (20180805.1) ...
Setting up python3-dnspython (1.16.0-1build1) ...
Setting up python3-selinux (3.0-1build2) ...
Setting up python3-crypto (2.6.1-13ubuntu2) ...
Setting up python3-argcomplete (1.8.1-1.3ubuntu1) ...
Setting up python3-lib2to3 (3.8.10-0ubuntu1~20.04) ...
Setting up python3-distutils (3.8.10-0ubuntu1~20.04) ...
Setting up python3-requests-ntlm (1.1.0-1) ...
Setting up python3-libcloud (2.8.0-1) ...
Setting up python3-netaddr (0.7.19-3) ...
/usr/lib/python3/dist-packages/netaddr/strategy/__init__.py:189: SyntaxWarning:
  "is not" with a literal. Did you mean "!="?
    if word_sep is not '':
Setting up python3-winrm (0.3.0-2) ...
Setting up ansible (2.9.6+dfsg-1) ...
Processing triggers for man-db (2.9.1-1) ...
aleena@aleena-VirtualBox:~/Desktop$
```

```
aleena@aleena-VirtualBox:~/Desktop$ sudo apt-get install ansible
[sudo] password for aleena:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ieee-data python3-argcomplete python3-crypto python3-distutils
  python3-dnspython python3-jinja2 python3-jmespath python3-kerberos
  python3-lib2to3 python3-libcloud python3-netaddr python3-ntlm-auth
  python3-requests-kerberos python3-requests-ntlm python3-selinux
  python3-winrm python3-xmldict
Suggested packages:
  cowsay sshpass python-jinja2-doc ipython3 python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-distutils
  python3-dnspython python3-jinja2 python3-jmespath python3-kerberos
  python3-libcloud python3-netaddr python3-ntlm-auth
  python3-requests-kerberos python3-requests-ntlm python3-selinux
  python3-winrm python3-xmldict
The following packages will be upgraded:
  python3-lib2to3
1 upgraded, 17 newly installed, 0 to remove and 349 not upgraded.
Need to get 9,942 kB of archives.
After this operation, 92.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-jinja2 all 2
.10.1-2 [95.5 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-crypto amd64
  2.6.1-13ubuntu2 [237 kB]
```

## Ansible Version

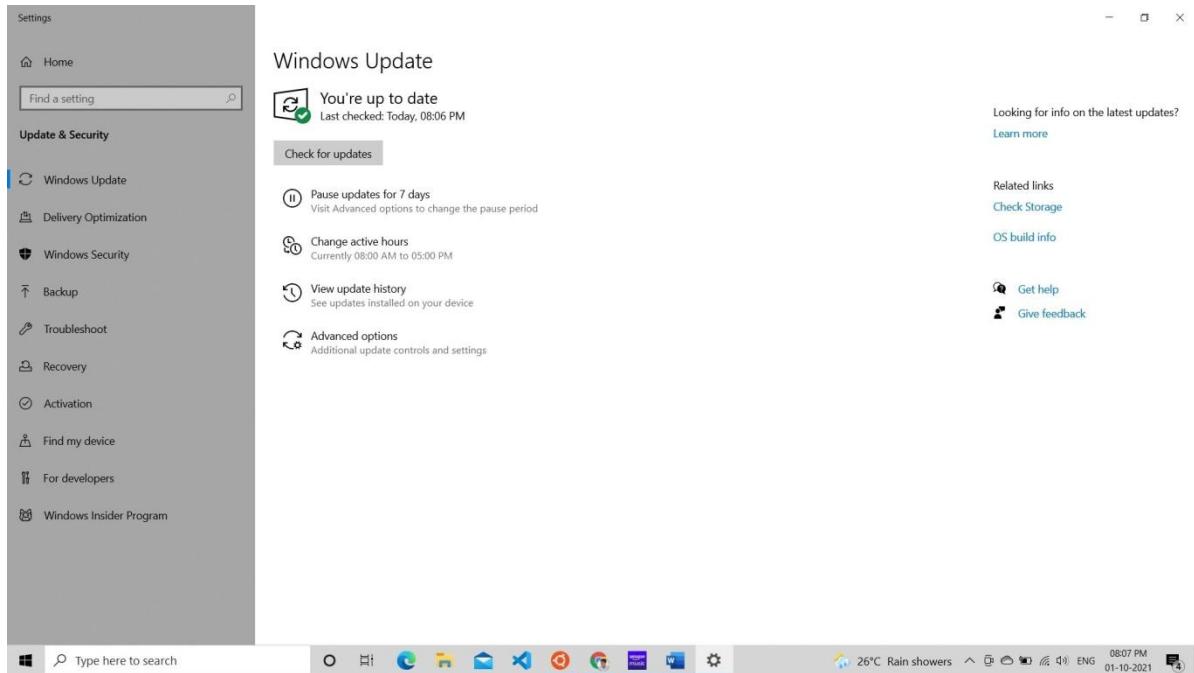
```
processing triggers for man-db (2.9.1-1) ...
aleena@aleena-VirtualBox:~/Desktop$ ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/aleena/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
    ansible python module location = /usr/lib/python3/dist-packages/ansible
      executable location = /usr/bin/ansible
        python version = 3.8.5 (default, Jul 28 2020, 12:59:40) [GCC 9.3.0]
aleena@aleena-VirtualBox:~/Desktop$
```

## Installing Docker on Windows 10

First make sure Windows is up to date.

In the Windows search type "Windows Update" and select Windows Update setting

You should see a green check and "You're up to date". If not click "Check for updates".  
You will need to repeat this process until you no longer have any updates to install.



## Next install WSL2

From the Windows Search Type "powershell" then right-click on Windows PowerShell and then Run as administrator.

Click 'Yes' to allow PowerShell to make changes to your device.

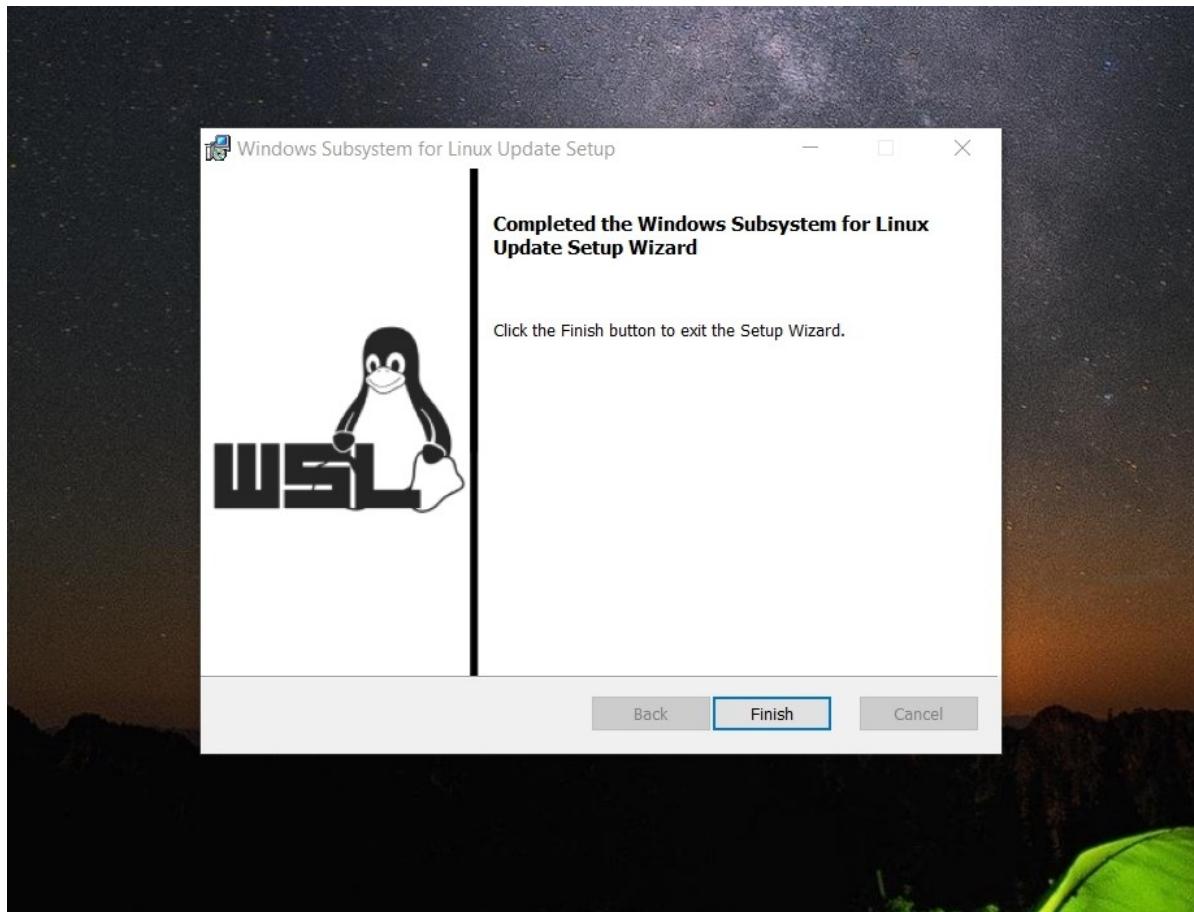
In the Administrator: Windows PowerShell window run (copy and past) "wsl – install" to install Windows Services for Linux (wsl).

```
Display usage information.  
PS C:\Windows\system32> wsl --install  
Installing: Virtual Machine Platform  
Virtual Machine Platform has been installed.  
Installing: Windows Subsystem for Linux  
Windows Subsystem for Linux has been installed.  
Downloading: WSL Kernel  
Installing: WSL Kernel  
WSL Kernel has been installed.  
Downloading: Ubuntu  
The requested operation is successful. Changes will not be effective until the system is rebooted.  
PS C:\Windows\system32>
```

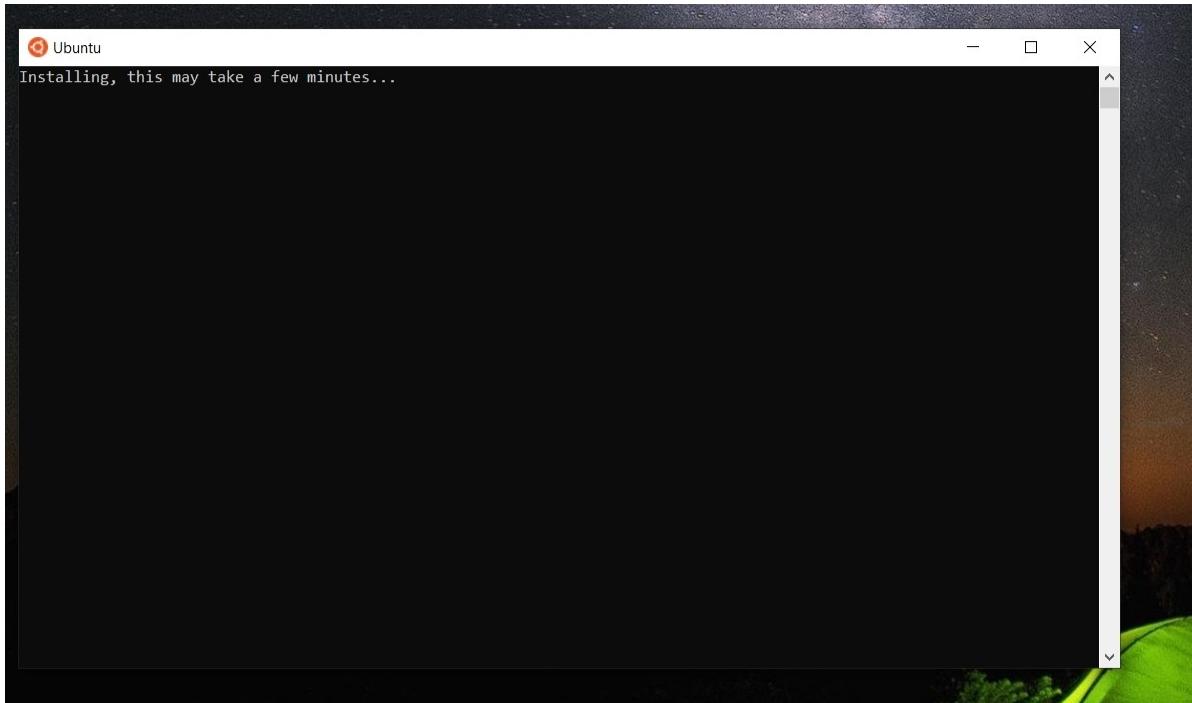
Next enable the Virtual Machine Platform. In the Administrator: Windows PowerShell run (copy and past) "dism.exe /online /enable-feature /featurename:VirtualMachinePlatform/all/norestart".

```
PS C:\Windows\system32> dism.exe /online /enable-feature /featurename:VirtualMachinePlatform /all /norestart  
Deployment Image Servicing and Management tool  
Version: 10.0.19041.844  
  
Image Version: 10.0.19043.1266  
  
Enabling feature(s)  
[=====100.0%=====]  
The operation completed successfully.  
PS C:\Windows\system32>
```

Download and install the [WSL2 Linux kernel update package for x64 machines](#)



set up a Linux user



```
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 20.04 LTS (GNU/Linux 5.10.16.3-microsoft-standard-WSL2 x86_64)  
  
 * Documentation:  https://help.ubuntu.com  
 * Management:    https://landscape.canonical.com  
 * Support:        https://ubuntu.com/advantage  
  
 System information as of Fri Oct  1 11:50:30 IST 2021  
  
 System load:  0.16           Processes:          8  
 Usage of /:   0.4% of 250.98GB  Users logged in:   0  
 Memory usage: 2%            IPv4 address for eth0: 172.24.46.235  
 Swap usage:   0%  
  
 0 updates can be installed immediately.  
 0 of these updates are security updates.  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update  
  
This message is shown once once a day. To disable it please create the  
/home/sam/.hushlogin file.
```

Reboot Windows.

Again, from the Windows Search Type "powershell" then right-click on Windows PowerShell and then Run as administrator.

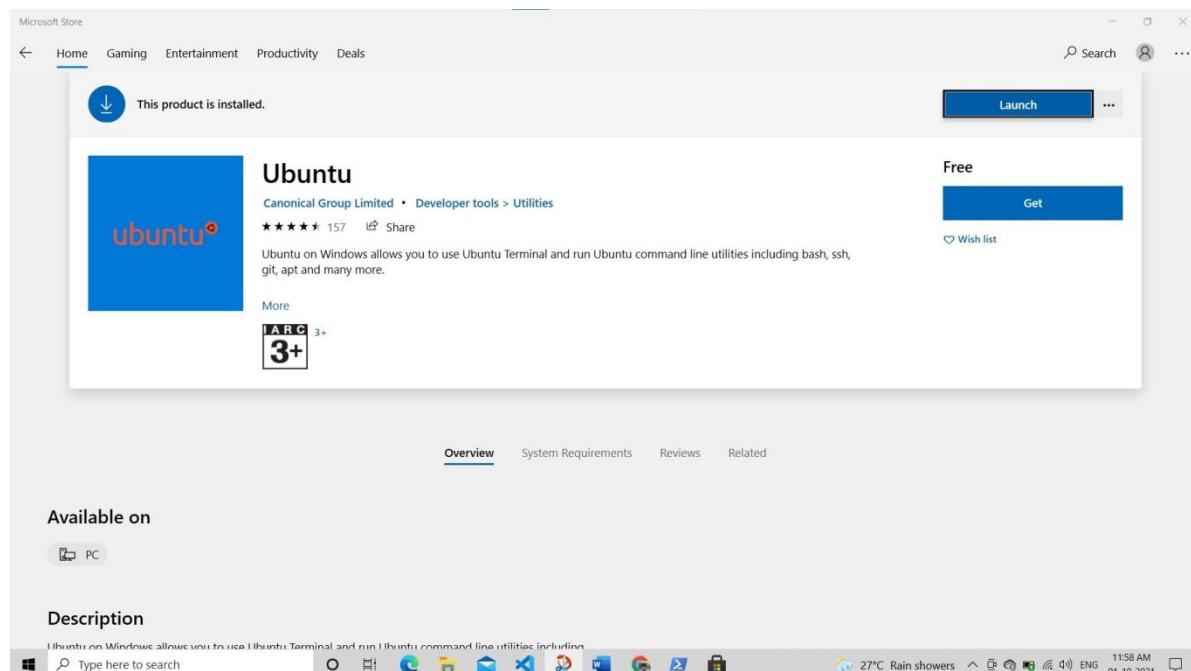
In the PowerShell window run "**wsl --set-default-version 2**".

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Windows\system32> wsl --set-default-version 2
For information on key differences with WSL 2 please visit https://aka.ms/wsl2
The operation completed successfully.
PS C:\Windows\system32>
```

Next install a Linux distribution from the [Microsoft Store](#)



You will now be able to run Linux commands in the Ubuntu terminal window.

```
3 sam@LAPTOP-2S6KTBFB: ~
$ run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
```

Now you can install [Docker Desktop for Windows](#)

Download the Docker Desktop for Windows installer from <https://www.docker.com/products/docker-desktop>

Run the installer.

## Configuration

Install required Windows components for  
WSL2 Add shortCUT tO desktop

Ok



## Docker Desktop

### Unpacking

```
Unpacking file: resources/d ocke r-desLto p.iso
Unpacking file: resources/d dvp.ico
  Unpacking file: resources/config-options.json
  Unpacking file: resources/componentsVersion.json
  Unpacking file: resources/bin/docker-compose
  Un packing file: resou rces/bin/docker
  Un packing file: resou rces/.gitignore
    Un packing file: In stal ler Cli. pdb
  Un packing file: In stal ler Cli. exe.config
  Un packing file: fronten cl/vk s\7iftshader icd.json
Ur pac k Jm fi 6 : frs nten c! ". 8 c' ijtuxt ñ ns pm '1at.b n
```

## Docker Desktop 4.1.0

Installation succeeded

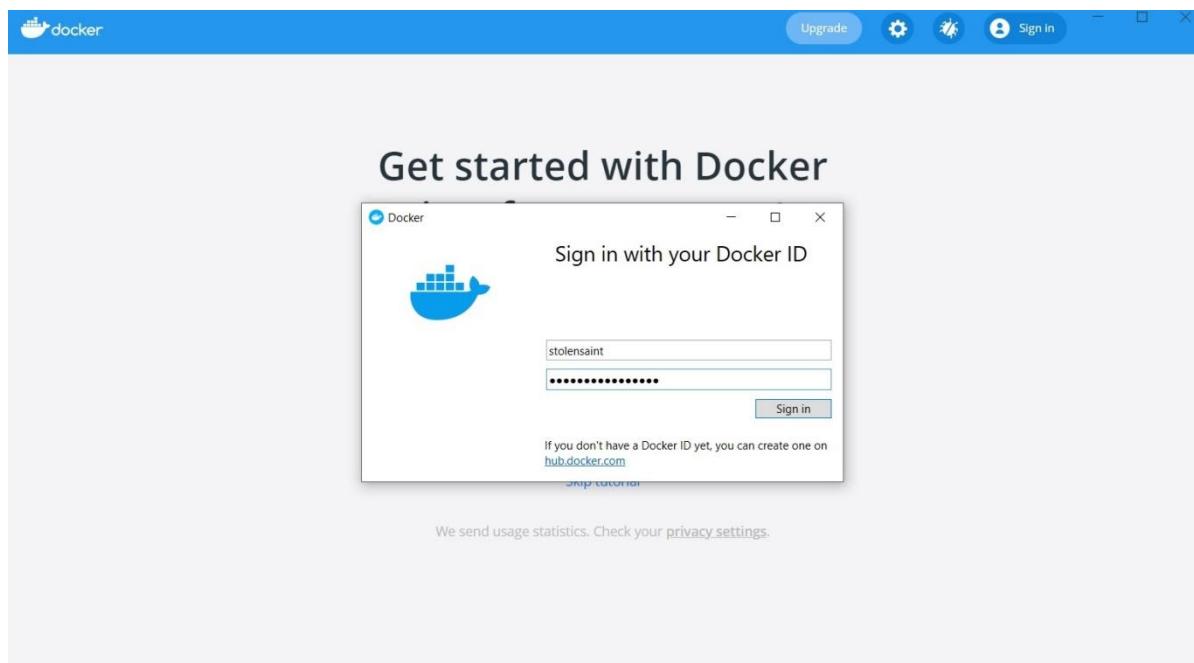
You must log out of Windows to complete installation.

**Close and log out**

---

Reboot Windows.

Login to Windows and let Docker finish setting up. This can take a few minutes depending on your machine.





## 0 You ran your first container image

A screenshot of the Docker desktop application's main dashboard. The left sidebar has a dark grey background with white text and icons. It shows a summary: 'Containers / Apps' (with a small bar chart icon), 'Images' (cloud icon), 'Volumes' (disk icon), and 'Dev Environments' (server icon) with a 'PREVIEW' badge. The main right panel has a light grey background. At the top, there's a search bar with a magnifying glass icon and the placeholder 'Search...'. To the right of the search bar is a 'Sort by' dropdown arrow. Below the search bar, there are two container cards. The first card is for 'repo alpine/git' with the status 'EXITED (0)'. The second card is for 'docker-tutorial docker101tutorial' with the status 'RUNNING' and 'PORT: 80'. Both cards have a small green icon to their left.

Run the docker “Hello World” from an Ubuntu Terminal run "docker run hello-world".

```
unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
2db29710123e: Pull complete
Digest: sha256:9ade9cc2e26189a19c2e8854b9c8f1e14829b51c55a630ee675a5a9540ef6ccf
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
 1. The Docker client contacted the Docker daemon.
 2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
    (amd64)
 3. The Docker daemon created a new container from that image which runs the
    executable that produces the output you are currently reading.
 4. The Docker daemon streamed that output to the Docker client, which sent it
    to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

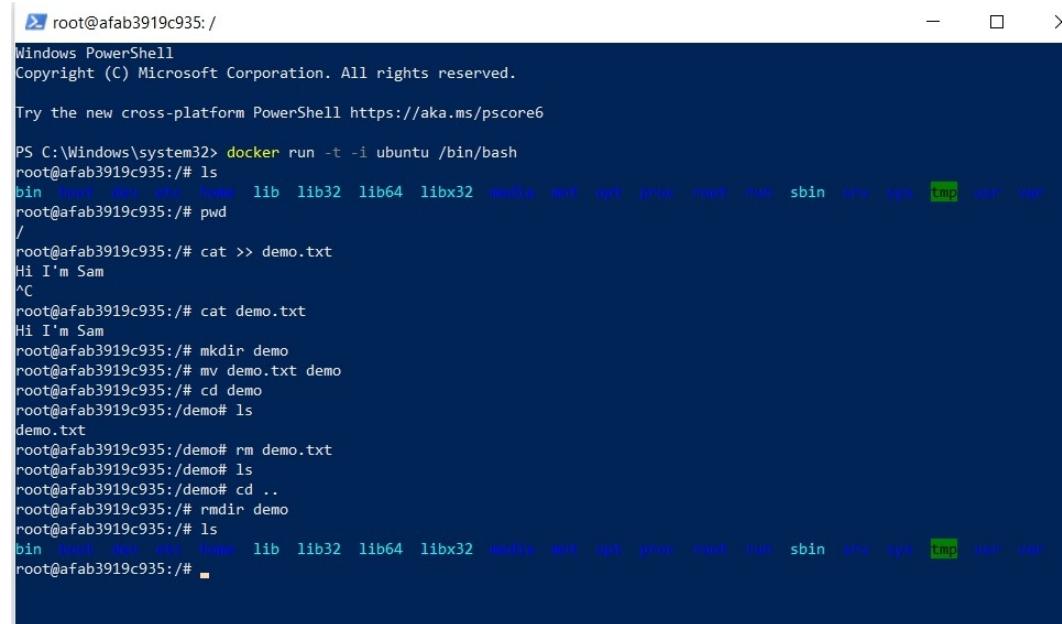
Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/
```

## Running the Ubuntu Machine

Run the command “`docker run -t -i ubuntu /bin/bash`” in powershell

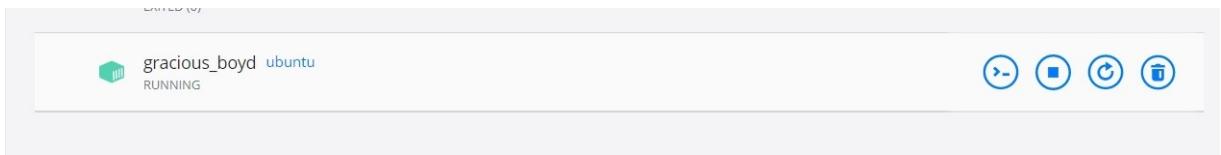
This is a Linux root bash, try some commands



A screenshot of a Windows PowerShell window titled "root@afab3919c935:". The window shows a root shell on a Docker container. The prompt is "root@afab3919c935:~". The session starts with the PowerShell logo and "Windows PowerShell" text. It then shows standard directory navigation and file operations like creating, moving, and deleting files. A notable interaction is where the user types "Hi I'm Sam" and receives a response. The session ends with the user navigating back to the root directory.

```
PS C:\Windows\system32> docker run -t -i ubuntu /bin/bash
root@afab3919c935:~# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@afab3919c935:~# pwd
/
root@afab3919c935:~# cat >> demo.txt
Hi I'm Sam
^C
root@afab3919c935:~# cat demo.txt
Hi I'm Sam
root@afab3919c935:~# mkdir demo
root@afab3919c935:~# mv demo.txt demo
root@afab3919c935:~# cd demo
root@afab3919c935:~/demo# ls
demo.txt
root@afab3919c935:~/demo# rm demo.txt
root@afab3919c935:~/demo# ls
root@afab3919c935:~/demo# cd ..
root@afab3919c935:~# rmdir demo
root@afab3919c935:~# ls
bin  boot  dev  etc  home  lib  lib32  lib64  libx32  media  mnt  opt  proc  root  run  sbin  srv  sys  tmp  usr  var
root@afab3919c935:~#
```

## Docker GUI-Containers



## Removing All Containers

root@afab3919c935:/# exit  
exit  
PS C:\Windows\system32> docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
8d21c1d81c22	ubuntu:latest	"bash"	6 hours ago	Exited (255) 8 minutes ago		busy_maxwell
1b0186a069a3	ubuntu	"bash"	6 hours ago	Exited (0) 6 hours ago		serene_dubinsky
48ab9a4423d5	ubuntu	"bash"	7 hours ago	Exited (0) 7 hours ago		serene_bhaskara
fd9061619454	ubuntu	"bash"	7 hours ago	Exited (0) 7 hours ago		beautiful_tereshkova
398156a697cc	hello-world	"/hello"	8 hours ago	Exited (0) 8 hours ago		jolly_torvalds
a7e83e3eeeda	docker101tutorial	"/docker-entrypoint..."	8 hours ago	Exited (0) 7 hours ago		docker-tutorial
e750d0f55bb4	alpine/git	"git clone https://g..."	8 hours ago	Exited (0) 8 hours ago		repo

PS C:\Windows\system32>

PS C:\Windows\system32> docker rm -f busy\_maxwell  
busy\_maxwell

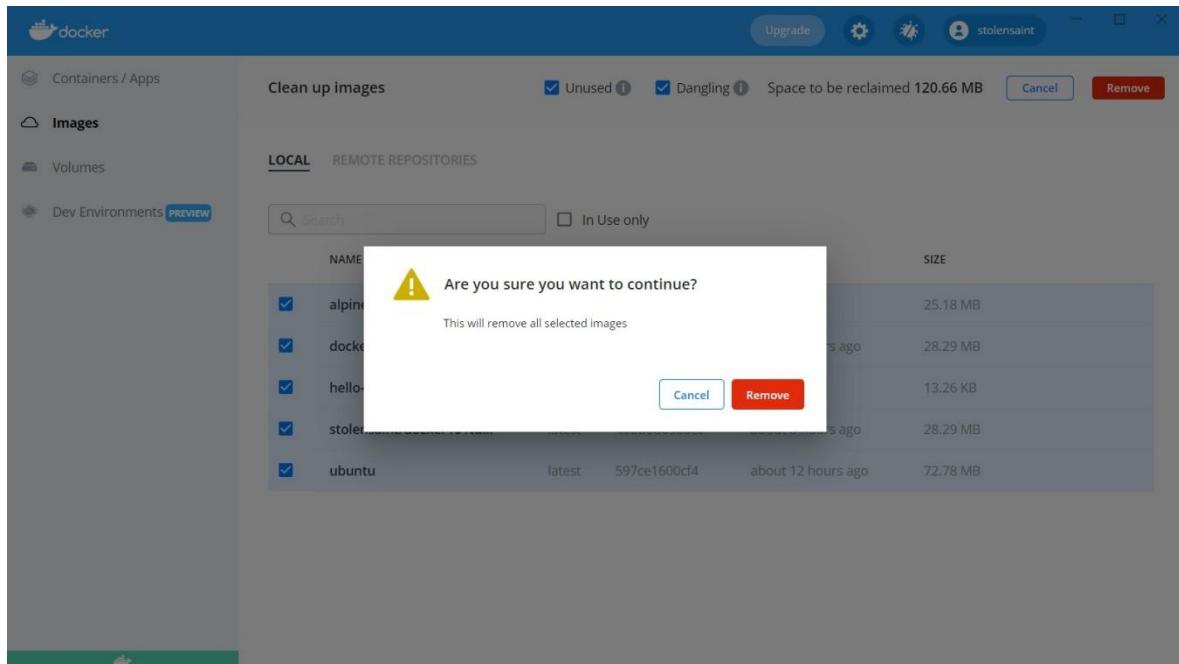
PS C:\Windows\system32> docker ps -a

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
afab3919c935	ubuntu	"/bin/bash"	7 minutes ago	Exited (0) 2 minutes ago		gracious_boyd
1b0186a069a3	ubuntu	"bash"	6 hours ago	Exited (0) 6 hours ago		serene_dubinsky
48ab9a4423d5	ubuntu	"bash"	8 hours ago	Exited (0) 7 hours ago		serene_bhaskara
fd9061619454	ubuntu	"bash"	8 hours ago	Exited (0) 7 hours ago		beautiful_tereshkova
398156a697cc	hello-world	"/hello"	8 hours ago	Exited (0) 8 hours ago		jolly_torvalds
a7e83e3eeeda	docker101tutorial	"/docker-entrypoint..."	8 hours ago	Exited (0) 8 hours ago		docker-tutorial
e750d0f55bb4	alpine/git	"git clone https://g..."	8 hours ago	Exited (0) 8 hours ago		repo

PS C:\Windows\system32> docker rm -f gracious\_boyd  
gracious\_boyd

The Docker Desktop interface shows a sidebar with 'Containers / Apps' selected. The main area displays a large blue shipping container icon. Below it, the text 'No containers running' is centered. At the bottom, there's a note: 'Try running a container: Copy and paste this command into your terminal and then come back' followed by a command line input field containing 'docker run -d -p 80:80 docker/getting-started'.

## Cleaning Up Images



## WIRESHARK

### Wireshark for Linux

- sudo apt-get install wireshark

```
aleena@aleena-VirtualBox:~/Desktop$ sudo apt-get install wireshark
[sudo] password for aleena:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5
  libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins
  libqt5multimediasupport5 libqt5multimediawidgets5 libqt5network5
  libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l
  libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13 libwiretap10
  libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme
  qttranslations5-l10n wireshark-common wireshark-qt
Suggested packages:
  qt5-image-formats-plugins qtwayland5 snmp-mibs-downloader geoipupdate
  geoip-database geoip-database-extra libjs-leaflet
  libjs-leaflet.markercluster wireshark-doc
The following NEW packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5
  libqt5gui5 libqt5multimedia5 libqt5multimedia5-plugins
  libqt5multimediasupport5 libqt5multimediawidgets5 libqt5network5
  libqt5opengl5 libqt5printsupport5 libqt5svg5 libqt5widgets5 libsmi2l
  libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark13 libwiretap10
  libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme
  qttranslations5-l10n wireshark wireshark-common wireshark-qt
0 upgraded, 29 newly installed, 0 to remove and 349 not upgraded.
Need to get 32.8 MB of archives.
After this operation, 163 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Setting up libwiretap10:amd64 (3.2.3-1) ...
Setting up libxcb-xinerama0:amd64 (1.14-2) ...
Setting up qttranslations5-l10n (5.12.8-0ubuntu1) ...
Setting up libqt5core5a:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libwireshark-data (3.2.3-1) ...
Setting up libqt5dbus5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libqt5gui5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libqt5network5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up wireshark-common (3.2.3-1) ...
Setting up libqt5multimedia5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libqt5printsupport5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up qt5-gtk-platformtheme:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libqt5multimediasupport5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5multimediawidgets5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5multimediasupport5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5multimediasupport5:amd64 (5.12.8-0ubuntu1) ...
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for shared-mime-info (1.15-1) ...
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
aleena@aleena-VirtualBox:~/Desktop$
```

- sudo dpkg-reconfigure wireshark-common
- sudo adduser \$USER wireshark

```
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
aleena@aleena-VirtualBox:~/Desktop$ sudo dpkg-reconfigure wireshark-common
aleena@aleena-VirtualBox:~/Desktop$ sudo adduser $USER wireshark
Adding user 'aleena' to group 'wireshark' ...
Adding user aleena to group wireshark
Done.
```

The Wireshark Network Analyzer

**Capture**

...using this filter:  Enter a capture filter ... All interfaces shown

- Cisco remote capture: ciscodump
- DisplayPort AUX channel monitor capture: dpauxmon
- Random packet generator: randpkt
- systemd Journal Export: sdjournal
- SSH remote capture: sshdump
- UDP Listener remote capture: udpdump

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You are running Wireshark 3.2.3 (Git v3.2.3 packaged as 3.2.3-1).

Ready to load or capture No Packets Profile: Default

Capturing from enp0s3

No. Time Source Destination Protocol Length Info

1	0.000000000	10.0.2.15	91.189.89.199	NTP	90 N	Frame 1: 90 bytes on wire (720 bits), 90 bytes captured (720 bits) on interface enp0s3 at 00:02:00:00:00:00 [ether PcsCompu_a5:2b:8a] > [ether RealtekU_12:35:02] on enp0s3 (Intel PRO/100 MT Desktop (QAT)) (PCIe)
2	0.344558746	91.189.89.199	10.0.2.15	NTP	90 N	Frame 2: 90 bytes on wire (720 bits), 90 bytes captured (720 bits) on interface enp0s3 at 00:02:00:00:00:00 [ether PcsCompu_a5:2b:8a] > [ether RealtekU_12:35:02] on enp0s3 (Intel PRO/100 MT Desktop (QAT)) (PCIe)
3	5.182769203	PcsCompu_a5:2b:8a	RealtekU_12:35:02	ARP	42 W	Frame 3: 42 bytes on wire (336 bits), 42 bytes captured (336 bits) on interface enp0s3 at 00:02:00:00:00:00 [ether PcsCompu_a5:2b:8a] > [ether RealtekU_12:35:02] on enp0s3 (Intel PRO/100 MT Desktop (QAT)) (PCIe)
4	5.184122668	RealtekU_12:35:02	PcsCompu_a5:2b:8a	ARP	60 1	Frame 4: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface enp0s3 at 00:02:00:00:00:00 [ether RealtekU_12:35:02] > [ether PcsCompu_a5:2b:8a] on enp0s3 (Intel PRO/100 MT Desktop (QAT)) (PCIe)

Frame 1: 90 bytes on wire (720 bits), 90 bytes captured (720 bits) on interface enp0s3 at 00:02:00:00:00:00 [ether PcsCompu\_a5:2b:8a] > [ether RealtekU\_12:35:02] on enp0s3 (Intel PRO/100 MT Desktop (QAT)) (PCIe)  
Ethernet II, Src: PcsCompu\_a5:2b:8a (08:00:27:a5:2b:8a), Dst: RealtekU\_12:35:02 (00:02:00:12:35:02)  
Internet Protocol Version 4, Src: 10.0.2.15, Dst: 91.189.89.199  
User Datagram Protocol, Src Port: 57422, Dst Port: 123  
Network Time Protocol (NTP Version 4, client)

No.	Time	Source	Destination	Protocol	Length	Info
0000	52 54 00 12 35 02 08 00 27 a5 2b 8a 08 00 45 10	RT-5...	' + . E-			
0010	00 4c e7 35 40 00 40 11 91 c8 0a 00 02 0f 5b bd	.L.5@.0.	.....[.			
0020	59 c7 e0 4e 00 7b 00 38 c1 dc 23 00 00 00 00 00	Y-N-{.8	....#.....			
0030	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....	.....			
0040	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00	.....	.....			
0050	00 00 e5 00 5e f5 1a 7a 2d fe	....^..Z -.	.....			

## Analyzing Data Packets on Wire shark

**\*enp0s3**

No.	Time	Source	Destination	Protocol	Length
157	174.674321965	10.0.2.15	34.122.121.32	HTTP	141 G
159	175.230132996	34.122.121.32	10.0.2.15	HTTP	202 H
196	474.630514996	10.0.2.15	35.232.111.17	HTTP	141 G
198	475.148233585	35.232.111.17	10.0.2.15	HTTP	202 H

```

Frame 157: 141 bytes on wire (1128 bits), 141 bytes captured (1128 bits) on interface enp0s3
Ethernet II, Src: PcsCompu_a5:2b:8a (08:00:27:a5:2b:8a), Dst: RealtekU_12:35:1 (00:0c:29:00:00:01)
Internet Protocol Version 4, Src: 10.0.2.15, Dst: 34.122.121.32
Transmission Control Protocol, Src Port: 47648, Dst Port: 80, Seq: 1, Ack: 1, 
Hypertext Transfer Protocol

```

No.	Time	Source	Destination	Protocol	Length
0000	52 54 00 12 35 02 08 00	27 a5 2b 8a 08 00 45 00	RT	5...'+...E.	
0010	00 7f 5a 91 40 00 40 06	38 3f 0a 00 02 0f 22 7a	.Z@.	8?...''Z	
0020	79 20 ba 20 00 50 17 9b	f7 3d 01 0b 94 02 50 18	y .P.	.=...P	
0030	fa fe a8 1a 00 00 47 45	54 20 2f 20 48 54 54 50	.....GE T /	HTTP	

**\*enp0s3**

No.	Time	Source	Destination	Protocol	Length
109	29.206137114	91.189.92.38	10.0.2.15	TLSv1.2	105
110	29.206259567	10.0.2.15	91.189.92.38	TCP	54
111	29.259573378	10.0.2.15	91.189.92.38	TLSv1.2	1262
112	29.259964647	10.0.2.15	91.189.92.38	TLSv1.2	148
113	29.260366266	91.189.92.38	10.0.2.15	TCP	60
114	29.260367032	91.189.92.38	10.0.2.15	TCP	60
115	29.718321020	91.189.92.38	10.0.2.15	TCP	1424
116	29.718415071	10.0.2.15	91.189.92.38	TCP	54
117	29.72223139302	91.189.92.38	10.0.2.15	TLSv1.2	1916
118	29.722237316	10.0.2.15	91.189.92.38	TCP	54
119	34.192514675	91.189.92.38	10.0.2.15	TLSv1.2	347

```

Frame 130: 85 bytes on wire (680 bits), 85 bytes captured (680 bits) on interface enp0s3
Ethernet II, Src: PcsCompu_a5:2b:8a (08:00:27:a5:2b:8a), Dst: RealtekU_12:35:1 (00:0c:29:00:00:01)
Internet Protocol Version 4, Src: 10.0.2.15, Dst: 91.189.92.38
Transmission Control Protocol, Src Port: 46536, Dst Port: 443, Seq: 1596, Ack: 1596, 
Transport Layer Security

```

No.	Time	Source	Destination	Protocol	Length
0000	52 54 00 12 35 02 08 00	27 a5 2b 8a 08 00 45 00	RT	5...'+...E.	
0010	00 47 4f 2f 40 00 40 06	27 90 0a 00 02 0f 5b bd	.GO@.	'....[.	
0020	5c 26 b5 c8 01 bb ae ee	b1 a0 00 e8 86 70 50 18	\&....pP.	....pP.	
0030	f6 2c c4 2b 00 00 15 03	03 00 1a 00 00 00 00 00	,+.......		

**\*enp0s3**

No.	Time	Source	Destination	Protocol	Length
77	16.182812535	10.0.2.15	192.168.100.64	DNS	76
78	21.186216883	10.0.2.15	192.168.100.64	DNS	76
79	26.190978858	10.0.2.15	192.168.100.64	DNS	76
80	26.346503320	192.168.100.64	10.0.2.15	DNS	76
136	79.863922544	10.0.2.15	192.168.100.64	DNS	89
137	79.975866822	192.168.100.64	10.0.2.15	DNS	89
138	80.022977849	10.0.2.15	192.168.100.64	DNS	89
143	85.027359600	10.0.2.15	192.168.100.64	DNS	89
144	85.093618554	192.168.100.64	10.0.2.15	DNS	89
152	174.013361818	10.0.2.15	192.168.100.64	DNS	89
153	174.260142260	192.168.100.64	10.0.2.15	DNS	137

```

Frame 153: 137 bytes on wire (1096 bits), 137 bytes captured (1096 bits) on interface enp0s3
Ethernet II, Src: RealtekU_12:35:02 (52:54:00:12:35:02), Dst: PcsCompu_a5:2b:8a (08:00:27:a5:2b:8a)
Internet Protocol Version 4, Src: 192.168.100.64, Dst: 10.0.2.15
User Datagram Protocol, Src Port: 53, Dst Port: 54696
Domain Name System (response)

```

No.	Time	Source	Destination	Protocol	Length
0000	08 00 27 a5 2b 8a 52 54 00 12 35 02 08 00 45 00	..'+.RT 5...E.			
0010	00 7b 02 7e 00 00 40 11 46 fd c0 a8 64 40 0a 00	{~. @. F...d@..			
0020	02 0f 00 35 d5 a8 00 67 30 02 3a d4 81 80 00 01	.5...g 0 :....			
0030	00 03 00 00 00 00 12 63 6f 6e 6e 65 63 74 69 76	....c onnectiv			

## Shell Scripting Lab Assignments

1. Write a shell script to ask your name, and college name and print it on the screen.

```
aleena@aleena-VirtualBox:~/Desktop$ chmod u+x shell1
aleena@aleena-VirtualBox:~/Desktop$ ./shell1
Enter Your Name
aleena
Enter Your College Name
AJCE
```

```
GNU nano 4.8                               shell1
echo Enter Your Name
read name
echo Enter Your College Name
read college
clear
echo Details you entered
echo Name:$name
echo College:$college
```

```
Details you entered
Name:aleena
College:AJCE
aleena@aleena-VirtualBox:~/Desktop$
```

2. Write a shell script to set a value for a variable and display it on command line interface.

```
Activities  Terminal  Oct 2 10:27 •
[+]
aleena@aleena-VirtualBox: ~/Desktop
GNU nano 4.8                               shell2.txt
#!/bin/bash
n=16
echo $n
```

```
chmod: cannot access 'shell2': No such file or directory
aleena@aleena-VirtualBox:~/Desktop$ chmod u+x shell2.txt
aleena@aleena-VirtualBox:~/Desktop$ ./shell2.txt
16
aleena@aleena-VirtualBox:~/Desktop$
```

3. Write a shell script to perform addition, subtraction, multiplication, division with two numbers that is accepted from user.

```
GNU nano 4.8                               New Buffer                               Modified
#!/bin/bash
echo "enter 2 numbers:"
read a
read b
echo "enter choice:"
echo "1.addition"
echo "2.subtraction"
echo "3.multiplication"
echo "4.division"
read ch
case $ch in
1)res=`echo $a+$b|bc`;;
2)res=`echo $a-$b|bc`;;
3)res=`echo $a*$b|bc`;;
4)res=`echo $a/$b|bc`;;
esac
echo "result:$res"

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x shell3
aleena@aleena-VirtualBox:~/Desktop$ ./shell3
enter 2 numbers:
2
1
enter choice:
1.addition
2.subtraction
3.multiplication
4.division
1
result:3
```

4. Write a shell script to check the value of a given number and display whether the number is found or not.

```
GNU nano 4.8                               shell4
echo Enter array limit
read limit
echo Enter elements:
n=1
while [ $n -le $limit ]
do
read num
eval arr$n=$num
n=`expr $n + 1`
done
echo Enter key elements:
read key
low=1
high=4n
found=0
while [ $found -eq 0 -a $high -gt $low ]
do
mid=`expr \$slow + \$high ) \ 2`
eval t=\$arr$mid
if [ $key -eq $t ]
then
found=1
elif [ $key -lt $t ]
then
high=`expr $mid + 1`
```

```

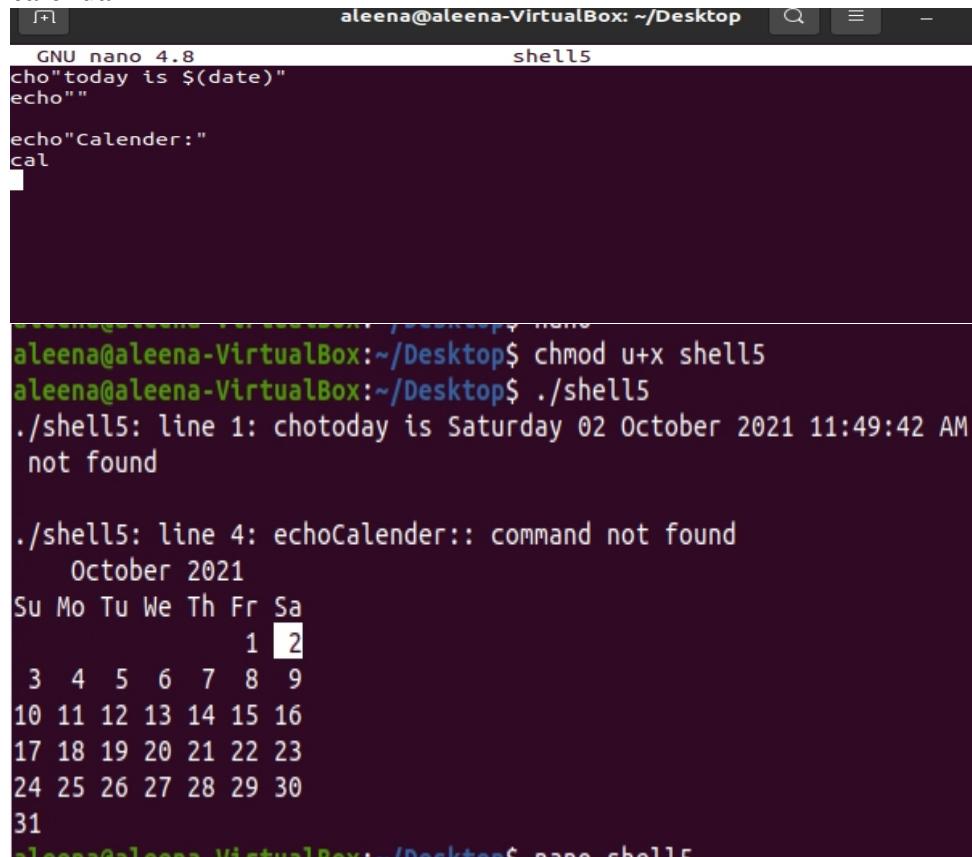
high=`expr $mid + 1`
else
low=`expr $mid + 1`
fi
done

if [ $found -eq 0 ]
then
echo Number is not found
else
echo Number is found
fi

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x shell4
aleena@aleena-VirtualBox:~/Desktop$ ./shell4
Enter array limit
5
Enter elements:
1
4
5
3
5
Enter key elements:
8
./shell4: line 16: [: 4n: integer expression expected
Number is not found

```

5. Write a shell script to display current date,  
calendar



```

GNU nano 4.8                                     shell5
cho"today is $(date)"
echo ""

echo"Calender:"
cal

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x shell5
aleena@aleena-VirtualBox:~/Desktop$ ./shell5
./shell5: line 1: chotoday is Saturday 02 October 2021 11:49:42 AM
not found

./shell5: line 4: echoCalender:: command not found
          October 2021
Su Mo Tu We Th Fr Sa
      1  2
 3  4  5  6  7  8  9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
31
aleena@aleena-VirtualBox:~/Desktop$ nano shell5

```

6. Write a shell script to check a number is even or

```
GNU nano 4.8                                         shell6
clear
echo "____even or odd____"
echo -n "enter a number:"
read n
echo -n "RESULT: "
if [ `expr $n % 2` == 0 ]
then
echo "$n is even"
else
echo "$n is odd"
fi
odd
```

```
aleena@aleena-VirtualBox:~/Desktop$ ./shell6
____even or odd____
enter a number:5
RESULT: 5 is odd
aleena@aleena-VirtualBox:~/Desktop$
```

7. Write a shell script to check a number is greater than, less than or equal to another number

```
GNU nano 4.8                                         sh
echo "Enter two numbers"
read a
read b
echo "a=$a"
echo "b=$b"
if [ $a \> $b ]
then
echo "a is greater than b"
else
echo "a is less than b"
fi
if [ $a == $b ]
then
echo "a is equal to b"
else
echo "a is not equal to b"
fi
```

```
aleena@aleena-VirtualBox:~/Desktop$ chmod u+x sh
aleena@aleena-VirtualBox:~/Desktop$ ./sh
Enter two numbers
4
6
a=4
b=6
a is less than b
a is not equal to b
```

8. Write a shell script to find the sum of first 10 numbers.

```
aleena@aleena-VirtualBox: ~/Desktop
```

```
GNU nano 4.8 e
num=10

i=1
sum=0

while [ $i -le $num ]
do
sum=`expr $sum + $i`
i=`expr $i + 1`
done
echo "the sum of first 10 numbers is"
echo "-----"
echo "$sum"

aleena@aleena-VirtualBox:~/Desktop$ nano e
aleena@aleena-VirtualBox:~/Desktop$ chmod u+x e
aleena@aleena-VirtualBox:~/Desktop$ ./e
the sum of first 10 numbers is
-----
55
```

9. Write a shell script to find the sum, the average and the product of the four integers entered.

```
aleena@aleena-VirtualBox: ~/Desktop
```

```
GNU nano 4.8 t
echo enter 4 integers with space between
read a b c d
sum=`expr $a + $b + $c + $d`
avg=`expr $sum / 4`
dce=`expr \($dec * 1000 \) / 4`
prod=`expr $a \* $b \* $c \* $d`
echo SUM=$sum
echo AVERAGE=$avg.$dec
echo PRODUCT=$prod

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x t
aleena@aleena-VirtualBox:~/Desktop$ ./t
enter 4 integers with space between
1 2 3 4
SUM=10
AVERAGE=2.
PRODUCT=24
aleena@aleena-VirtualBox:~/Desktop$ █
```

**10.** Write a shell script to find the smallest of three numbers.

```
GNU nano 4.8
echo "Enter a: "
read a
echo "Enter b: "
read b
echo "Enter c: "
read c
s=$a
if [ $b -lt $s ]
then
s=$b
fi
if [ $c -lt $s ]
then
s=$c
fi
echo Smallest of $a $b $c is $s

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x q
aleena@aleena-VirtualBox:~/Desktop$ ./q
Enter a:
3
Enter b:
5
Enter c:
10
Smallest of 3 5 10 is 3
```

**11.** Write a shell program to find factorial of given number

```
GNU nano 4.8
echo "Enter a number"
read num

fact=1

for((i=2;i<=num;i++))
{
fact=$((fact * i))
}

echo Factorial of $num is:
echo $fact

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x w
aleena@aleena-VirtualBox:~/Desktop$ ./w
Enter a number
5
Factorial of 5 is:
120
```

12. Write a shell program to check a number is palindrome or not

```
GNU nano 4.8 aleena@aleena-VirtualBox: ~/Desktop
echo Enter a number
read n
num=0
on=$n
while [ $n -gt 0 ]
do
num=$(expr $num \* 10)
k=$((n % 10))
num=$((num + $k))
n=$((n / 10))
done
if [ $num -eq $on ]
then
echo This number is a palindrome
else
echo This number is not a palindrome
fi

aleena@aleena-VirtualBox:~/Desktop$ chmod u+x m
aleena@aleena-VirtualBox:~/Desktop$ ./m
Enter a number
313
This number is a palindrome
aleena@aleena-VirtualBox:~/Desktop$ ./m
Enter a number
379
This number is not a palindrome
```

13. Write a shell script to find the average of the numbers entered in command line.

```
GNU nano 4.8 aleena@aleena-VirtualBox: ~/Desktop
clear

echo "enter 1st nmbr"
read a

echo "enter 2nd nmbr"
read b

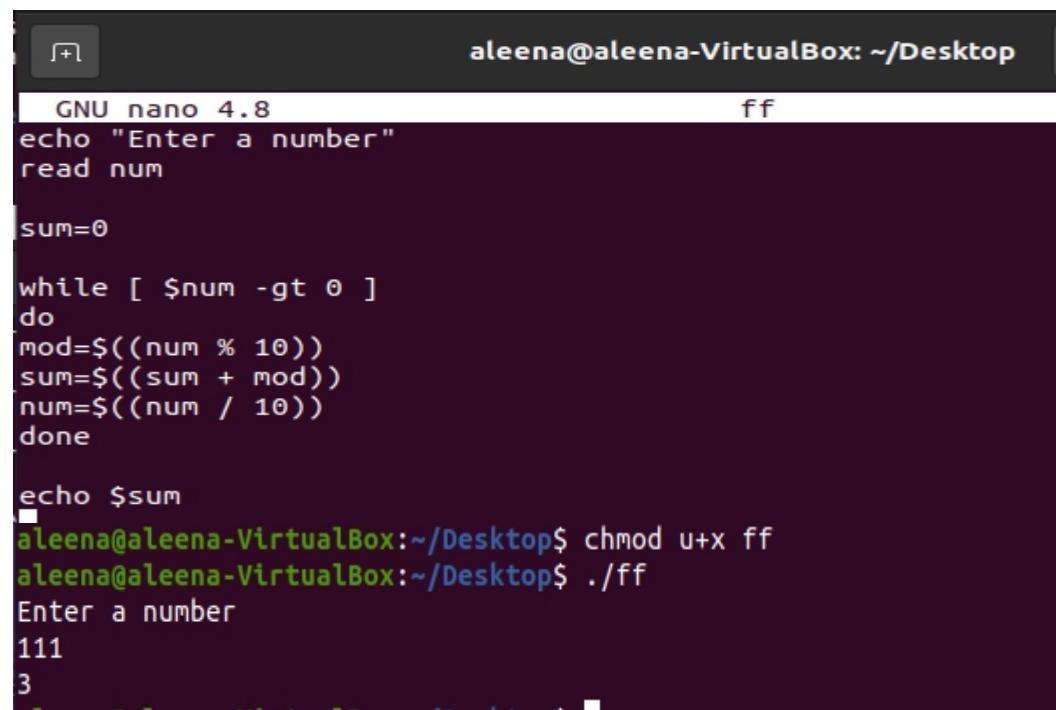
echo "enter 3rd nmbr"
read c

sum=`expr $a + $b + $c`
avg=`expr $sum / 3`

echo "average = $avg"
```

```
aleena@aleena-VirtualBox: ~/Desktop
enter 1st nmbr
4
enter 2nd nmbr
6
enter 3rd nmbr
7
average = 5
aleena@aleena-VirtualBox:~/Desktop$
```

14. Write a shell program to find the sum of all the digits in a number.



The terminal window shows the following content:

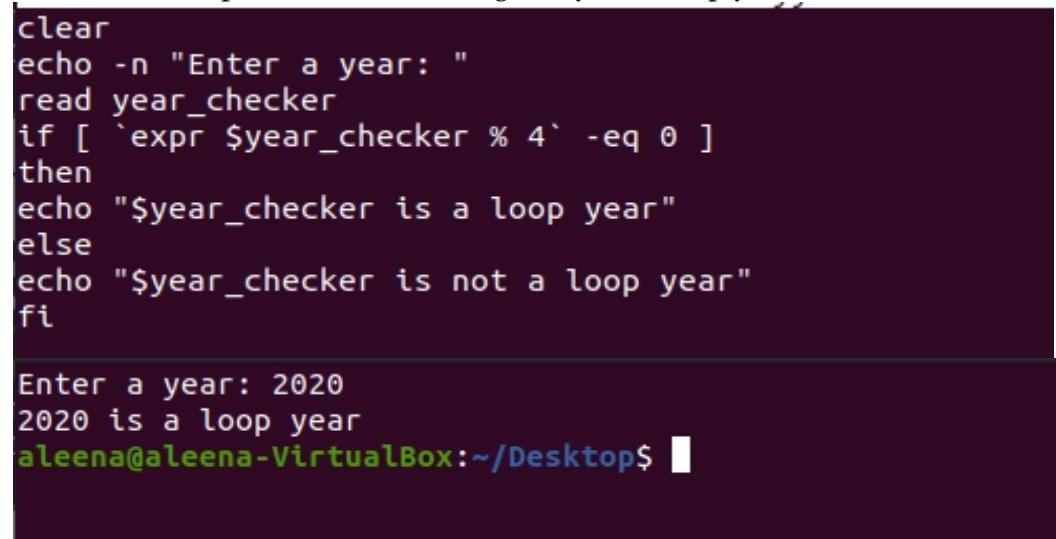
```
aleena@aleena-VirtualBox: ~/Desktop
GNU nano 4.8
echo "Enter a number"
read num

sum=0

while [ $num -gt 0 ]
do
mod=$((num % 10))
sum=$((sum + mod))
num=$((num / 10))
done

echo $sum
■
aleena@aleena-VirtualBox:~/Desktop$ chmod u+x ff
aleena@aleena-VirtualBox:~/Desktop$ ./ff
Enter a number
111
3
```

15. Write a shell Script to check whether given year is leap year or not.



The terminal window shows the following content:

```
clear
echo -n "Enter a year: "
read year_checker
if [ `expr $year_checker % 4` -eq 0 ]
then
echo "$year_checker is a leap year"
else
echo "$year_checker is not a leap year"
fi

Enter a year: 2020
2020 is a leap year
aleena@aleena-VirtualBox:~/Desktop$ ■
```