

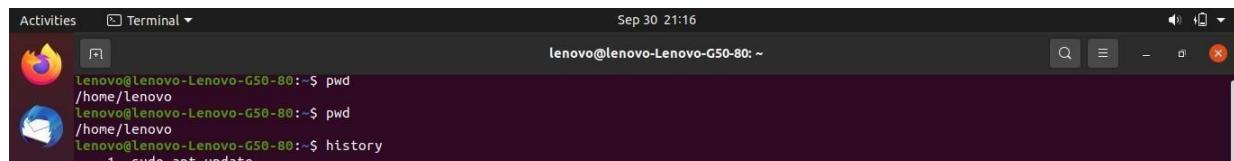
# **Networking and System Administration Lab**

## **LAB RECORD**

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## 1. PWD(Print Working Word)

- 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.

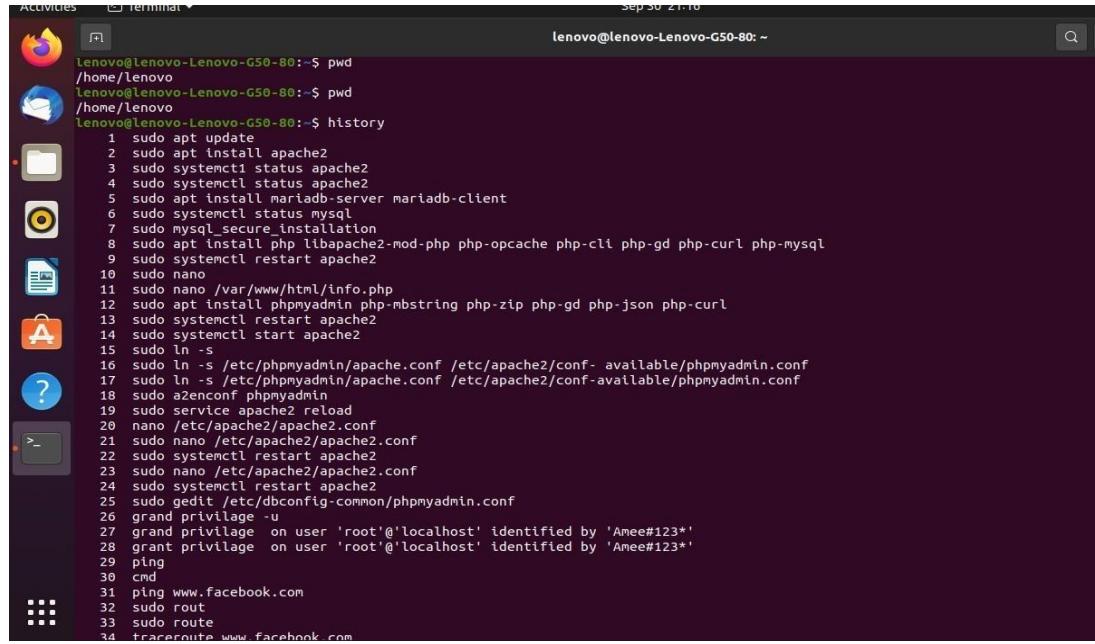


A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal". The terminal content shows the following session:

```
Activities Terminal Sep 30 21:16
lenovo@lenovo-Lenovo-G50-80:~$ pwd
/home/lenovo
lenovo@lenovo-Lenovo-G50-80:~$ pwd
/home/lenovo
lenovo@lenovo-Lenovo-G50-80:~$ history
1 sudo apt update
```

## 2. History

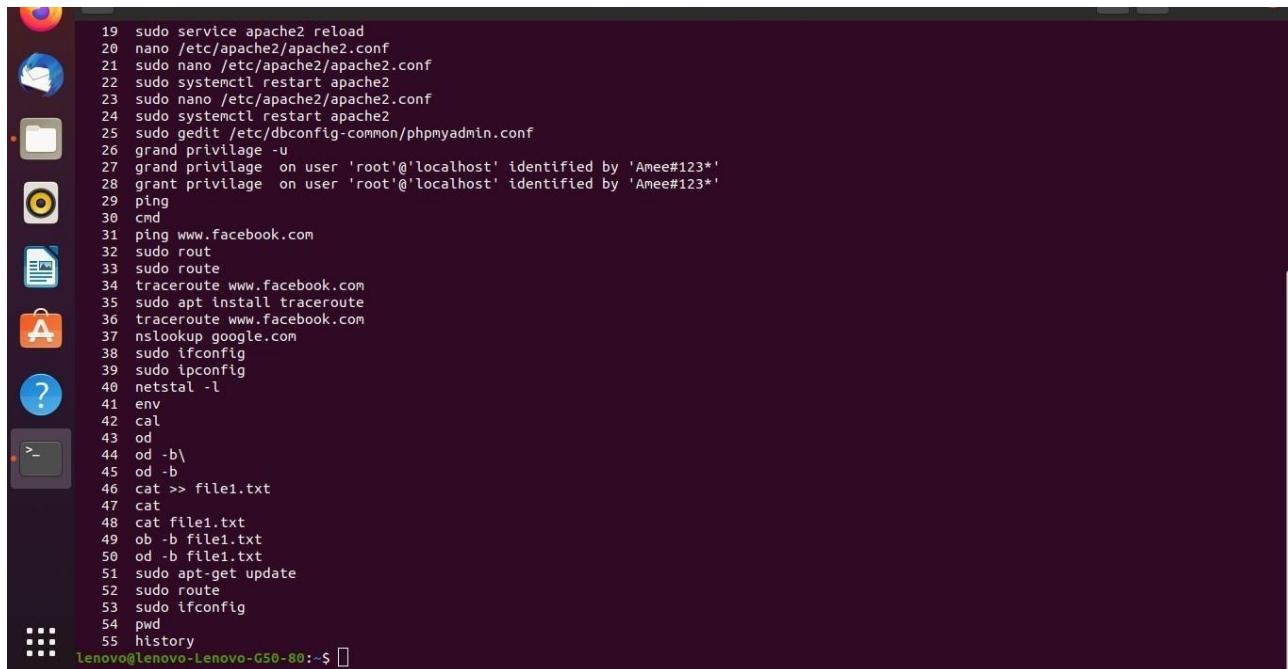
- To review the commands, you have entered before .



A screenshot of a Linux desktop environment showing a terminal window. The terminal window title is "Terminal" and the command prompt is "lenovo@lenovo-Lenovo-G50-80: ~". The window shows a command history from session 30. The history includes various system management commands such as apt update, apt install apache2, systemctl status apache2, sudo apt install mariadb-server mariadb-client, sudo mysql\_secure\_installation, sudo apt install php libapache2-mod-php php-opcache php-cli php-gd php-curl php-mysql, sudo systemctl restart apache2, sudo nano /var/www/html/info.php, sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl, sudo systemctl restart apache2, sudo systemctl start apache2, sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf-available/phpmyadmin.conf, sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf-available/phpmyadmin.conf, sudo a2enconf phpmyadmin, sudo service apache2 reload, nano /etc/apache2/apache2.conf, sudo nano /etc/apache2/apache2.conf, sudo systemctl restart apache2, sudo systemctl restart apache2, sudo gedit /etc/dbconfig-common/phpmyadmin.conf, sudo gedit /etc/dbconfig-common/phpmyadmin.conf, grant privilege -u, grant privilege on user 'root'@'localhost' identified by 'Amee#123\*', grant privilege on user 'root'@'localhost' identified by 'Amee#123\*', ping, cmd, ping www.facebook.com, sudo rout, sudo route, traceroute www.facebook.com.

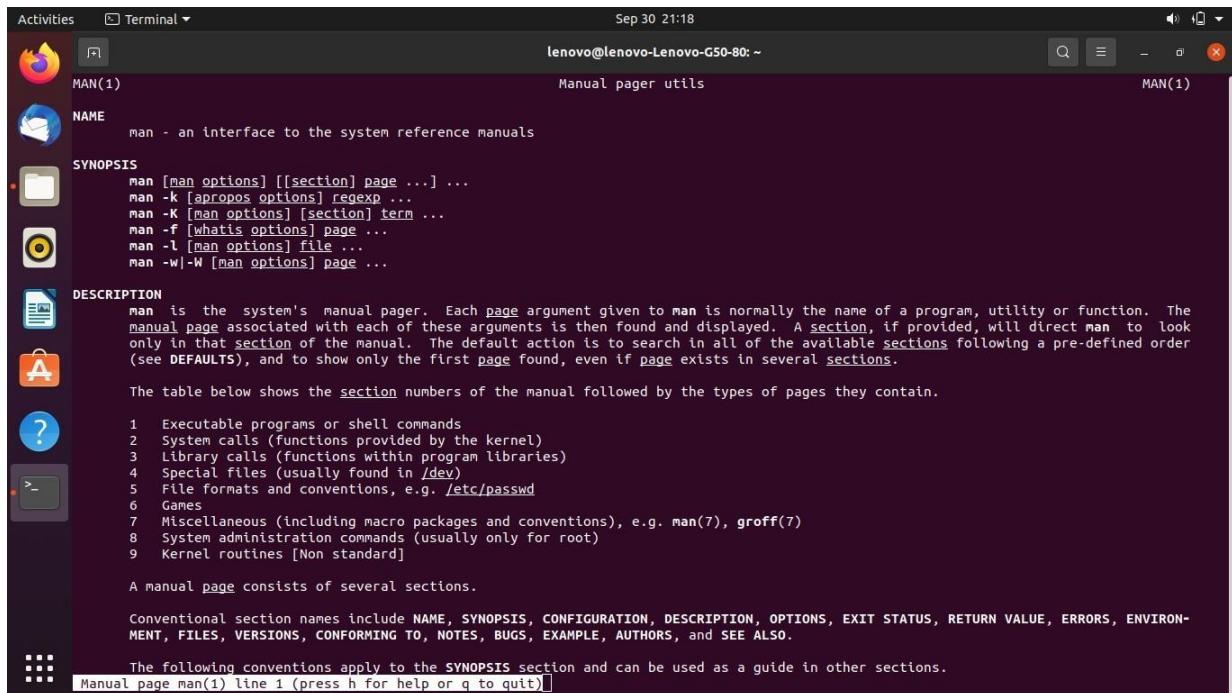
```
lenovo@lenovo-Lenovo-G50-80:~$ pwd
/home/lenovo
lenovo@lenovo-Lenovo-G50-80:~$ pwd
/home/lenovo
lenovo@lenovo-Lenovo-G50-80:~$ history
 1  sudo apt update
 2  sudo apt install apache2
 3  sudo systemctl status apache2
 4  sudo systemctl status apache2
 5  sudo apt install mariadb-server mariadb-client
 6  sudo systemctl status mysql
 7  sudo mysql_secure_installation
 8  sudo apt install php libapache2-mod-php php-opcache php-cli php-gd php-curl php-mysql
 9  sudo systemctl restart apache2
10  sudo nano
11  sudo nano /var/www/html/info.php
12  sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl
13  sudo systemctl restart apache2
14  sudo systemctl start apache2
15  sudo ln -s
16  sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf-available/phpmyadmin.conf
17  sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf-available/phpmyadmin.conf
18  sudo a2enconf phpmyadmin
19  sudo service apache2 reload
20  nano /etc/apache2/apache2.conf
21  sudo nano /etc/apache2/apache2.conf
22  sudo systemctl restart apache2
23  sudo nano /etc/apache2/apache2.conf
24  sudo systemctl restart apache2
25  sudo gedit /etc/dbconfig-common/phpmyadmin.conf
26  grant privilege -u
27  grant privilege on user 'root'@'localhost' identified by 'Amee#123*'
28  grant privilege on user 'root'@'localhost' identified by 'Amee#123*'
29  ping
30  cmd
31  ping www.facebook.com
32  sudo rout
33  sudo route
34  traceroute www.facebook.com
```

### 3. Man



```
19 sudo service apache2 reload
20 nano /etc/apache2/apache2.conf
21 sudo nano /etc/apache2/apache2.conf
22 sudo systemctl restart apache2
23 sudo nano /etc/apache2/apache2.conf
24 sudo systemctl restart apache2
25 sudo gedit /etc/dbconfig-common/phpmyadmin.conf
26 grant privilege -u
27 grant privilege on user 'root'@'localhost' identified by 'Amee#123*'
28 grant privilege on user 'root'@'localhost' identified by 'Amee#123*'
29 ping
30 cmd
31 ping www.facebook.com
32 sudo rout
33 sudo route
34 traceroute www.facebook.com
35 sudo apt install traceroute
36 traceroute www.facebook.com
37 nslookup google.com
38 sudo ifconfig
39 sudo ipconfig
40 netstal -l
41 env
42 cal
43 od
44 od -b \
45 od -b
46 cat >> file1.txt
47 cat
48 cat file1.txt
49 ob -b file1.txt
50 od -b file1.txt
51 sudo apt-get update
52 sudo route
53 sudo ifconfig
54 pwd
55 history
lenovo@lenovo-Lenovo-G50-80:~$
```

- Shows the manual instructions of the tail command
- Man, man to start learning about man utility



```
Activities Terminal Sep 30 21:18 lenovo@lenovo-Lenovo-G50-80:~ Manual pager utils lenovo@lenovo-Lenovo-G50-80:~ MAN(1)
NAME man - an interface to the system reference manuals
SYNOPSIS
man [man options] [[section] page ...]
man -k [apropos options] regexp ...
man -K [man options] [section] term ...
man -f [whatis options] page ...
man -l [man options] file ...
man -w|-W [man options] page ...
DESCRIPTION
man is the system's manual pager. Each page argument given to man is normally the name of a program, utility or function. The manual page associated with each of these arguments is then found and displayed. A section, if provided, will direct man to look only in that section of the manual. The default action is to search in all of the available sections following a pre-defined order (see DEFAULTS), and to show only the first page found, even if page exists in several sections.
The table below shows the section numbers of the manual followed by the types of pages they contain.
1 Executable programs or shell commands
2 System calls (functions provided by the kernel)
3 Library calls (functions within program libraries)
4 Special files (usually found in /dev)
5 File formats and conventions, e.g. /etc/passwd
6 Games
7 Miscellaneous (including macro packages and conventions), e.g. man(7), groff(7)
8 System administration commands (usually only for root)
9 Kernel routines [Non standard]
A manual page consists of several sections.
Conventional section names include NAME, SYNOPSIS, CONFIGURATION, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUE, ERRORS, ENVIRONMENT, FILES, VERSIONS, CONFORMING TO, NOTES, BUGS, EXAMPLE, AUTHORS, and SEE ALSO.
The following conventions apply to the SYNOPSIS section and can be used as a guide in other sections.
Manual page man(1) line 1 (press h for help or q to quit)]
```

## 4. Cd

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



```
55 history
lenovo@lenovo-Lenovo-G50-80:~$ man
What manual page do you want?
For example, try 'man man'.
lenovo@lenovo-Lenovo-G50-80:~$ man man
lenovo@lenovo-Lenovo-G50-80:~$ cd
lenovo@lenovo-Lenovo-G50-80:~$ pwd
/home/lenovo
lenovo@lenovo-Lenovo-G50-80:~$ ls
```

## 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)



```
lenovo@lenovo-Lenovo-G50-80:~$ cd
lenovo@lenovo-Lenovo-G50-80:~$ pwd
/home/lenovo
lenovo@lenovo-Lenovo-G50-80:~$ ls
Desktop  Downloads  Music      Pictures  'sudo apt install mariadb-server mariadb-client'  Videos
Documents  file1.txt  phpinfo.php  Public    Templates
lenovo@lenovo-Lenovo-G50-80:~$ mldir me2
```

## 6. Mkdir

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



```
Documents file1.txt phpinfo.php Public Templates
lenovo@lenovo-Lenovo-G50-80:~$ mkdir mca
lenovo@lenovo-Lenovo-G50-80:~$ ls
Desktop Downloads mca phpinfo.php Public Templates
Documents file1.txt Music Pictures 'sudo apt install mariadb-server mariadb-client' Videos
lenovo@lenovo-Lenovo-G50-80:~$ rmdir
```

## 7. Rmdir

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



```
Try 'rmdir --help' for more information.
lenovo@lenovo-Lenovo-G50-80:~$ rmdir mca
lenovo@lenovo-Lenovo-G50-80:~$ ls
Desktop  Downloads  Music      Pictures  'sudo apt install mariadb-server mariadb-client'  Videos
Documents  file1.txt  phpinfo.php  Public    Templates
lenovo@lenovo-Lenovo-G50-80:~$ touch newfile.txt
lenovo@lenovo-Lenovo-G50-80:~$ ls
```

## 8. Touch

- To create a blank new file.

```
Documents  file1.txt  phpinfo.php  Public  Templates
lenovo@lenovo-Lenovo-G50-80:~$ touch newfile.txt
lenovo@lenovo-Lenovo-G50-80:~$ ls
Desktop  Downloads  Music      phpinfo.php  Public          Templates
Documents  file1.txt  newfile.txt  Pictures    'sudo apt install mariadb-server mariadb-client'  Videos
lenovo@lenovo-Lenovo-G50-80:~$ rm newfile.txt
```

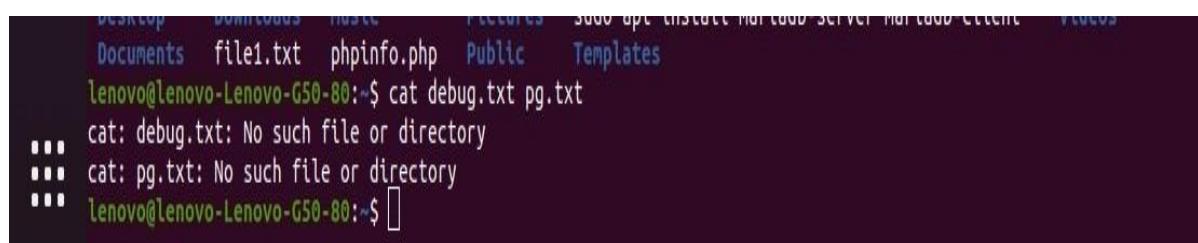
## 9. Rm

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

```
Documents file1.txt newfile.txt Pictures 'sudo apt install Mariadb-server Mariadb-client' Videos
lenovo@lenovo-Lenovo-G50-80:~$ rm newfile.txt
lenovo@lenovo-Lenovo-G50-80:~$ ls
Desktop Downloads Music Pictures 'sudo apt install mariadb-server mariadb-client' Videos
Documents file1.txt phpinfo.php Public Templates
lenovo@lenovo-Lenovo-G50-80:~$ 
```

## 10. Cat

- List the content of a file
- Cat >filename(create a new file)
- Cat filename1 filename2>filename3(join two files and store the output)
- Cat filename | tr a-z A-Z

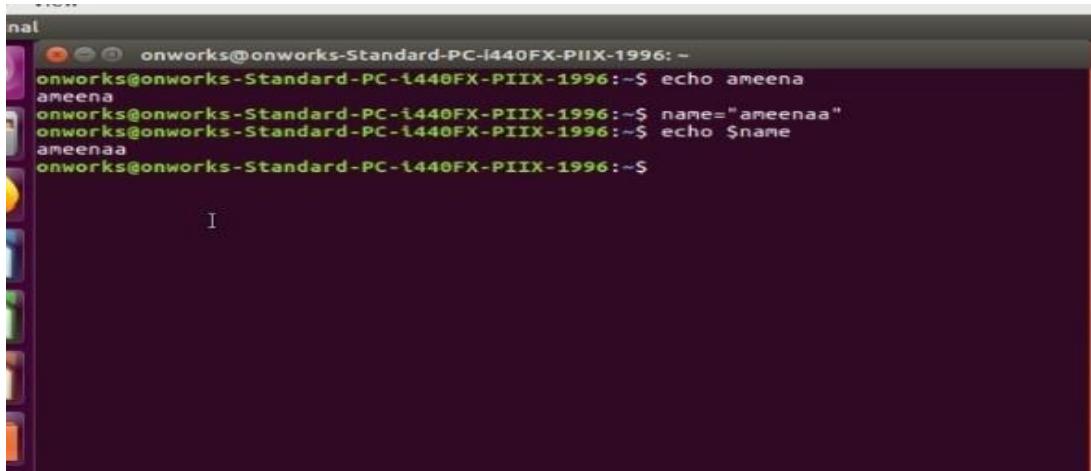


A screenshot of a terminal window on a Linux system. The window title is 'Terminal'. The background is dark, and the text is white. At the top, there's a horizontal bar with various icons and text labels like 'DESKTOP', 'Downloads', 'Music', 'Pictures', 'Sudo apt install MySQL Server MySQL Client', and 'Videos'. Below this, the terminal prompt shows the user's name 'lenovo' followed by the computer name 'Lenovo-G50-80' and the command '\$'. The user then types 'cat debug.txt pg.txt'. The terminal responds with two error messages: 'cat: debug.txt: No such file or directory' and 'cat: pg.txt: No such file or directory'. Finally, the user types '\$' again, which is followed by a small square cursor icon.

```
DESKTOP Downloads Music Pictures Sudo apt install MySQL Server MySQL Client Videos
Documents file1.txt phpinfo.php Public Templates
lenovo@lenovo-Lenovo-G50-80:~$ cat debug.txt pg.txt
cat: debug.txt: No such file or directory
cat: pg.txt: No such file or directory
lenovo@lenovo-Lenovo-G50-80:~$ 
```

echo command in linux is used to display line of text/string that are passed as an argument

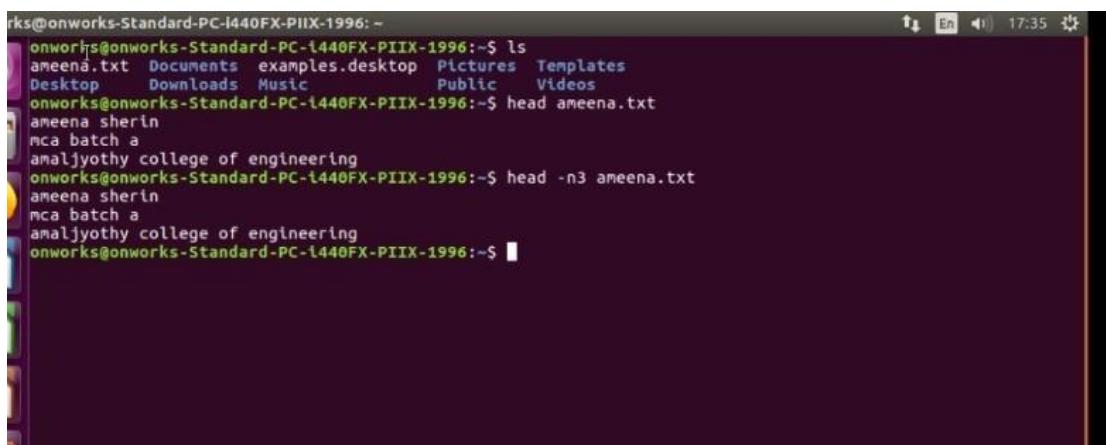
. This is a built in command that is mostly used in shell scripts and batch files to output status text to the screen or a file..



```
nal
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ echo ameena
ameena
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ name="ameenaa"
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ echo $name
ameenaa
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$
```

## head

The head command, as the name implies, print the top N number of data of the given input. By default, it prints the first 10 lines of the specified files. If more than one file name is provided then data from each file is preceded by its file name.



```
rks@onworks-Standard-PC-i440FX-PIIX-1996: ~
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ ls
ameena.txt  Documents  examples.desktop  Pictures  Templates
Desktop    Downloads  Music           Public    Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ head ameena.txt
ameena sherin
mca batch a
amaljyothi college of engineering
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ head -n3 ameena.txt
ameena sherin
mca batch a
amaljyothi college of engineering
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$
```

## Tail

The tail command, as the name implies, print the last N number of data of the given input. By default it prints the last 10 lines of the specified files. If more than one file name is provided then data from each file is preceded by its file name.



```
rk@onworks-Standard-PC-I440FX-PIIX-1996: ~
onworks@onworks-Standard-PC-I440FX-PIIX-1996:~$ ls
ameena.txt  Documents  examples.desktop  Pictures  Templates
Desktop   Downloads  Music           Public    Videos
onworks@onworks-Standard-PC-I440FX-PIIX-1996:~$ tail ameena.txt
ameena sherin
mca batch a
amaljyothy college of engineering
onworks@onworks-Standard-PC-I440FX-PIIX-1996:~$ tail -f ameena.txt
ameena sherin
mca batch a
amaljyothy college of engineering
```

## read

**read command** in Linux system is used to read from a file descriptor. Basically, this command read up the total number of bytes from the specified file descriptor into the buffer. If the number or count is zero then this command may detect the errors. But on success, it returns the number of bytes read. Zero indicates the end of the file. If some errors found then it returns -1.

## More

**more** command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large (For example log files). The more command also allows the user do scroll up and down through the page. The syntax along with options and command is as follows. Another application of more is to use it with some other command after a [pipe](#). When the output is large, we can use more command to see output one by one.

```
rks@onworks-Standard-PC-I440FX-PIIX-1996: ~
onworks@onworks-Standard-PC-I440FX-PIIX-1996:~$ more -d ameena.txt
ameena sherin
mca batch a
amaljyothi college of engineering
onworks@onworks-Standard-PC-I440FX-PIIX-1996:~$
```

## less

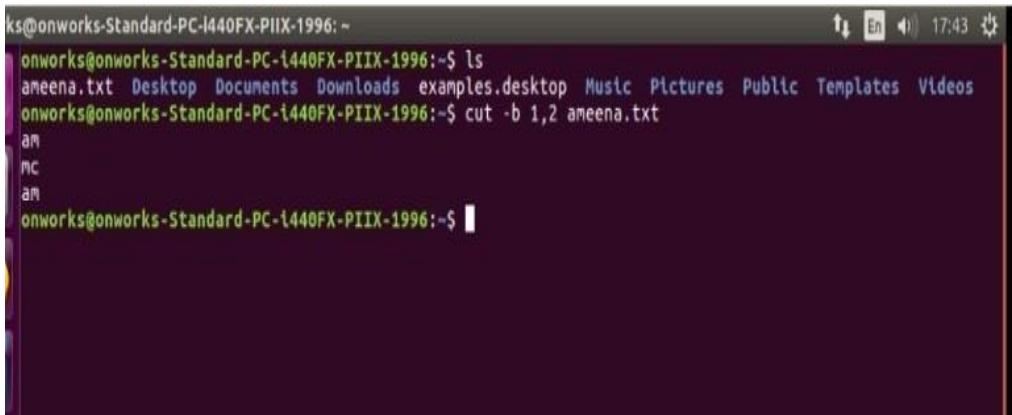
Less command is linux utility which can be used to read contents of text file one page(one screen) per time. It has faster access because if file is large, it don't access complete file, but access it page by page.

For example, if it's a large file and you are reading it using any text editor, then the complete file will be loaded to main memory, but less command don't load entire file, but load it part by part, which makes it faster. **syntax :**

```
rks@onworks-Standard-PC-I440FX-PIIX-1996: ~
ameena sherin
mca batch a
amaljyothi college of engineering
~
```

## **cut**

The cut command in UNIX is a command for cutting out the sections from each line of files and writing the result to standard output. It can be used to cut parts of a line by **byte position, character and field**. Basically the cut command slices a line and extracts the text. It is necessary to specify option with command otherwise it gives error. If more than one file name is provided then



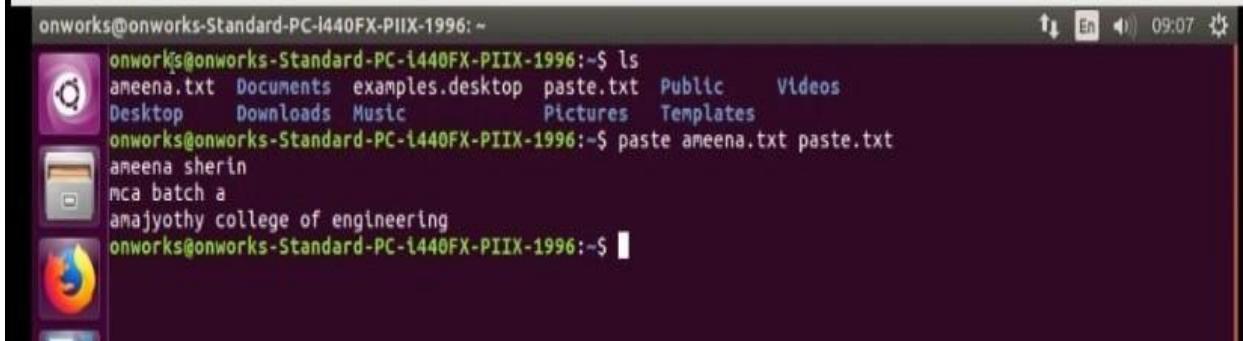
A screenshot of a Linux terminal window titled 'onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~'. The terminal shows the following command execution:

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
ameena.txt Desktop Documents Downloads examples.desktop Music Pictures Public Templates Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cut -b 1,2 ameena.txt
am
mc
am
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

data from each file is **not precedes** by its file name.

## **paste**

Paste command is one of the useful commands in Unix or Linux operating system. It is used to join files horizontally (parallel merging) by outputting lines consisting of lines from each file specified, separated by **tab** as delimiter, to the standard output. When no file is specified, or put dash ("") instead of file name, paste reads from standard input and gives output as it is until a interrupt command **[Ctrl-c]** is given.

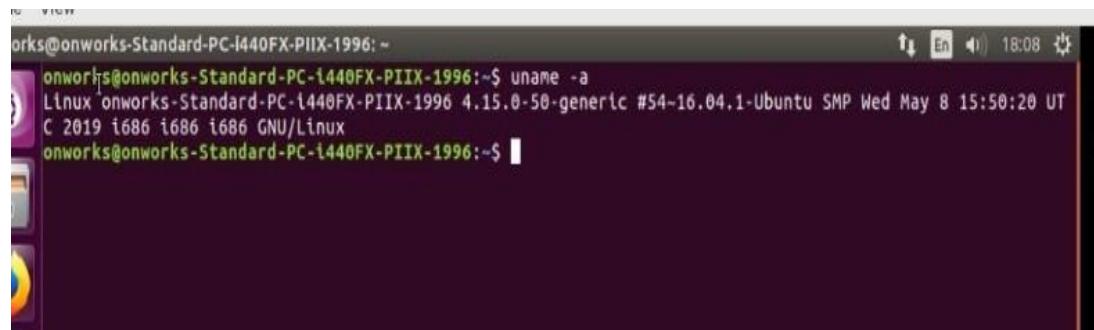


onworks@onworks-Standard-PC-i440FX-PIIX-1996:~

```
ameena.txt Documents examples.desktop paste.txt Public Videos
Desktop Downloads Music Pictures Templates
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ paste ameena.txt paste.txt
ameena sherin
mca batch a
amajyothy college of engineering
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

## uname

The command '*uname*' displays the information about the system.



onworks@onworks-Standard-PC-i440FX-PIIX-1996:~

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ uname -a
Linux onworks-Standard-PC-i440FX-PIIX-1996 4.15.0-50-generic #54~16.04.1-Ubuntu SMP Wed May 8 15:50:20 UT
C 2019 i686 i686 i686 GNU/Linux
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

## Cp

**cp** stands for **copy**. This command is used to copy files or group of files or directory. It creates an exact image of a file on a disk with different file name. **cp** command require at least two filenames in its arguments



```
ks@onworks-Standard-PC-i440FX-PIIX-1996: ~
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp ameenai.txt ameena2.txt
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
ameenai.txt Desktop Downloads Music Public Videos
ameena2.txt Documents examples.desktop Pictures Templates
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat ameenai.txt
ameena sherin
nca batch a
amaljyothi college of engineering
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat ameena2.txt
ameena sherin
nca batch a
amaljyothi college of engineering
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

## Mv

**mv** stands for **move**. **mv** is used to move one or more files or directories from one place to another in a file system like UNIX. It has two distinct functions:

**(i)** It renames a file or folder.

**(ii)** It moves a group of files to a different directory.

No additional space is consumed on a disk during renaming. This command normally

**works silently** means no prompt for confirmation.

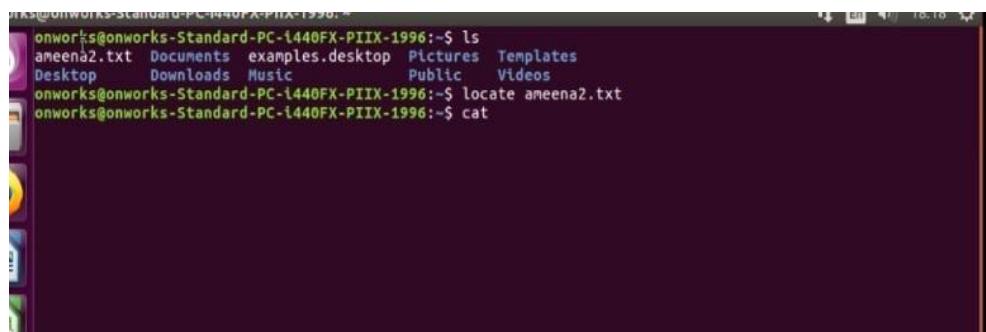


```
rks@onworks-Standard-PC-i440FX-PIIX-1996:~  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls  
ameena1.txt Desktop Downloads Music Public Videos  
ameena2.txt Documents examples.desktop Pictures Templates  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv ameena1.txt ameena2.txt  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

## Locate

*locate* command in Linux is used to find the files by name. There are two most widely used file searching utilities accessible to users are called *find* and *locate*. The *locate* utility works better and faster than *find* command counterpart because instead of searching the file system when a file search is initiated, it would look through a database. This database contains bits and parts of files and their corresponding paths on your system. By default,

locate command does not check whether the files found in the database still exist and it never reports files created after the most recent update of the relevant database.



```
rks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls  
ameena2.txt Documents examples.desktop Pictures Templates  
Desktop Downloads Music Public Videos  
rks@onworks-Standard-PC-i440FX-PIIX-1996:~$ locate ameena2.txt  
rks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat
```

## Find

The **find** command in UNIX is a command line utility for walking a file hierarchy. It can be used to find files and directories and perform subsequent operations on them. It supports searching by file, folder, name, creation date, modification date, owner and permissions. By using the '-exec' other UNIX commands can be executed on files or folders found.

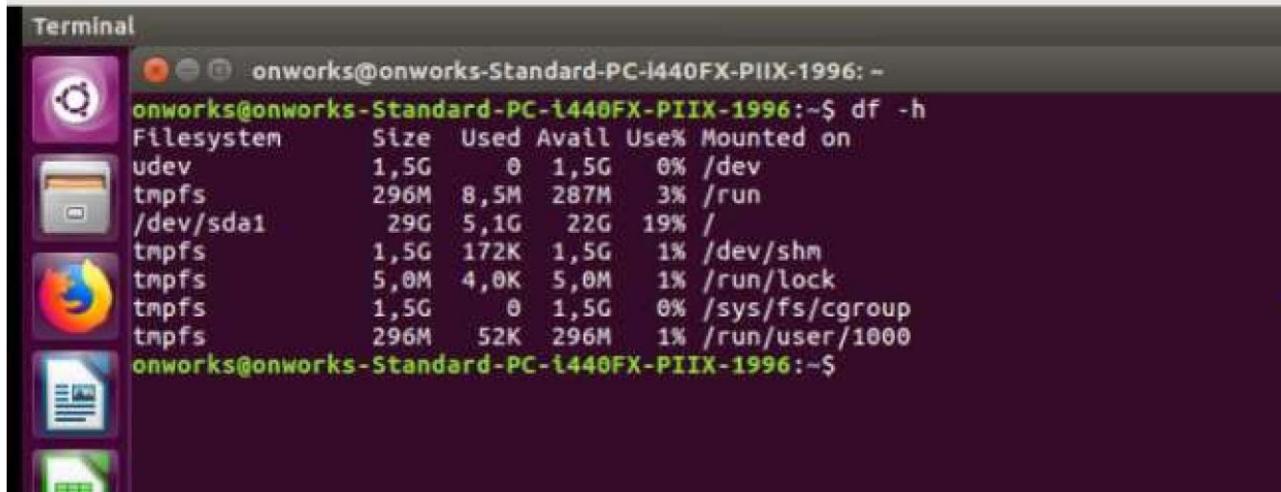
```
rishabh@rishabh:~/GFG$ find ./ -name sample.txt  
./GFG/demo2/sample.txt  
rishabh@rishabh:~$
```

## Grep

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. The pattern that is searched in the file is referred to as the regular expression (grep stands for globally search for regular expression and print out).

## df

The **df** command (short for disk free), is used to display information related to file systems about total space and available space. **Syntax :** df [OPTION] ... [FILE] ...



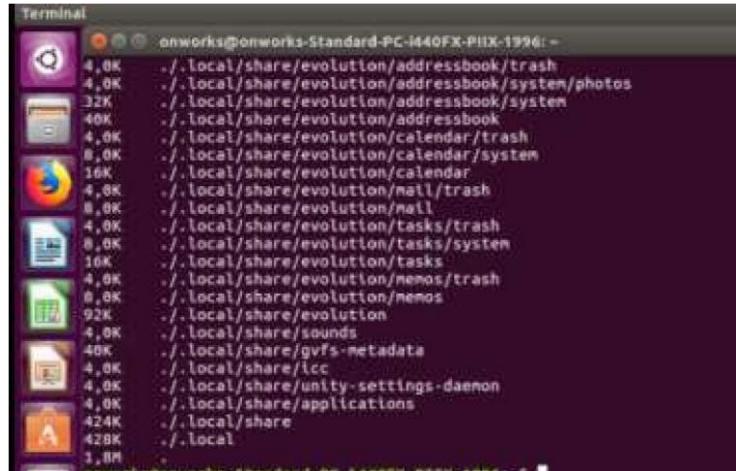
```
Terminal
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            1,5G   0  1,5G  0% /dev
tmpfs           296M  8,5M  287M  3% /run
/dev/sda1        29G  5,1G  22G  19% /
tmpfs           1,5G  172K  1,5G  1% /dev/shm
tmpfs           5,0M  4,0K  5,0M  1% /run/lock
tmpfs           1,5G   0  1,5G  0% /sys/fs/cgroup
tmpfs           296M  52K  296M  1% /run/user/1000
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$
```

## Du

**du** command, short for disk usage, is used to estimate file space usage. The du command can be used to track the files and directories which are consuming excessive amount of space on hard disk drive. **Syntax :**

```
du [OPTION]... [FILE]...
```

```
du [OPTION]... --files0-from=F
```



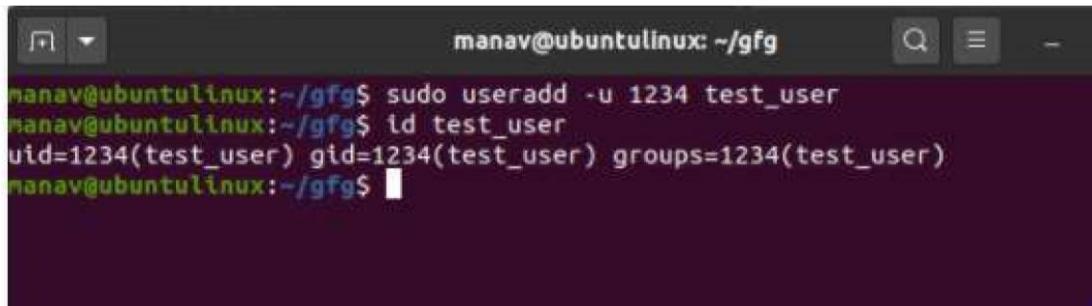
```
Terminal
onworks@onworks-Standard-PC-i440FX-PIIX-1996: ~$ du -h
4.0K ./local/share/evolution/addressbook/trash
4.0K ./local/share/evolution/addressbook/system/photos
32K ./local/share/evolution/addressbook/system
40K ./local/share/evolution/addressbook
4.0K ./local/share/evolution/calendar/trash
8.0K ./local/share/evolution/calendar/system
16K ./local/share/evolution/calendar
4.0K ./local/share/evolution/mail/trash
8.0K ./local/share/evolution/mail
4.0K ./local/share/evolution/tasks/trash
8.0K ./local/share/evolution/tasks/system
16K ./local/share/evolution/tasks
4.0K ./local/share/evolution/memos/trash
8.0K ./local/share/evolution/memos
32K ./local/share/evolution
4.0K ./local/share/sounds
40K ./local/share/gvfs-metadata
4.0K ./local/share/icc
4.0K ./local/share/unity-settings-daemon
4.0K ./local/share/applications
424K ./local/share
428K ./local
1.0M .
```

## Useradd

**useradd** is a command in Linux that is used to add user accounts to your system. It is just a symbolic link to adduser command in Linux and the difference between both of them is that useradd is a native binary compiled with system whereas adduser is a Perl script which uses useradd binary in the background. It make changes to the following files:

- /etc/passwd
- /etc/shadow
- /etc/group
- /etc/gshadow
- creates a directory for new user in /home **Syntax:**

```
useradd [options] name_of_the_user
```



```
manav@ubuntulinux:~/gfg$ sudo useradd -u 1234 test_user
manav@ubuntulinux:~/gfg$ id test_user
uid=1234(test_user) gid=1234(test_user) groups=1234(test_user)
manav@ubuntulinux:~/gfg$
```

## Userdel

**userdel** command in Linux system is used to delete a user account and related files. This command basically modifies the system account files, deleting all the entries which refer to the username LOGIN. It is a low-level utility for removing the users. **Syntax:** userdel [options] LOGIN



```
algoscale@algoscale-Lenovo-ideapad-330-15IKB:~$ userdel -h
Usage: userdel [options] LOGIN

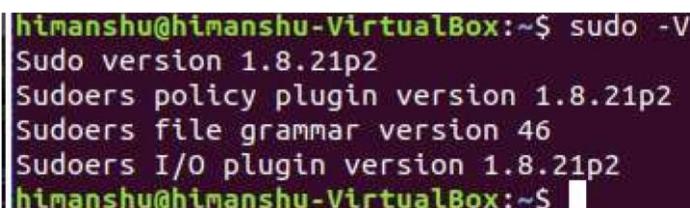
Options:
  -f, --force          force removal of files,
                       even if not owned by user
  -h, --help           display this help message and exit
  -r, --remove         remove home directory and mail spool
  -R, --root CHROOT_DIR
  -Z, --selinux-user  remove any SELinux user mapping for the user
```

## Sudo

sudo (**Super User DO**) command in Linux is generally used as a prefix of some command that only superuser are allowed to run. If you prefix “**sudo**” with any command, it will run that command with elevated privileges or in other words allow a user with proper permissions to execute a command as another user, such as the superuser. This is the equivalent of “run as administrator” option in Windows. The option of sudo lets us have multiple administrators.

These users who can use the **sudo** command need to have an entry in the **sudoers** file located at “**/etc/sudoers**”. Remember that to edit or view the sudoers file you have to use sudo command. To edit the sudoers file it is recommended to use “visudo” command.

By default, sudo requires that users authenticate themselves with a password which is the user’s password, not the root password itself.



```
himanshu@himanshu-VirtualBox:~$ sudo -V
Sudo version 1.8.21p2
Sudoers policy plugin version 1.8.21p2
Sudoers file grammar version 46
Sudoers I/O plugin version 1.8.21p2
himanshu@himanshu-VirtualBox:~$
```

## Passwd

*passwd* command in Linux is used to change the user account passwords. The root user reserves the privilege to change the password for any user on the system, while a normal user can only change the account password for his or her own account. **Syntax:**

```
passwd [options] [username]
```



## 1. usermod

- usermod command is used to change the properties of a user in Linux through the command line
- command-line utility that allows you to modify a user's login information
- #usermod --help
- #usermod -u 2000 Tom

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ usermod --help
Usage: usermod [options] LOGIN
Options:
  -c, --comment COMMENT      new value of the GECOS field
  -d, --home HOME_DIR        new home directory for the user account
  -e, --expired EXPIRE_DATE  set account expiration date to EXPIRE_DATE
  -f, --inactive INACTIVE    set password inactive after expiration
                            to INACTIVE
  -g, --gid GROUP            force use GROUP as new primary group
  -G, --groups GROUPS       new list of supplementary GROUPS
  -a, --append                append the user to the supplemental GROUPS
                               mentioned by the -G option without removing
                               him/her from other groups
  -h, --help                  display this help message and exit
  -l, --login NEW_LOGIN      new value of the login name
  -L, --lock                  lock the user account
  -m, --move-home             move contents of the home directory to the
                             new location (use only with -d)
  -o, --non-unique            allow using duplicate (non-unique) UID
  -p, --password PASSWORD    use encrypted password for the new password
  -R, --root CHROOT_DIR      directory to chroot into
  -s, --shell SHELL           new login shell for the user account
  -u, --uid UID               new UID for the user account
  -U, --unlock                unlock the user account
  -v, --add-subuids FIRST-LAST add range of subordinate uids
  -V, --del-subuids FIRST-LAST remove range of subordinate uids
  -w, --add-subgids FIRST-LAST add range of subordinate gids
  -W, --del-subgids FIRST-LAST remove range of subordinate gids
  -Z, --selinux-user SEUSER   new SELinux user mapping for the user account
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ usermod -u 2000 onworks
usermod: user onworks is currently used by process 826
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

## 1. groupadd

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ usermod -u 2000 onworks
usermod: user onworks is currently used by process 826
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd student
[sudo] password for onworks:
```

## 2. group- s

- #groups alice

print the groups a user is in

### 3.

#### groupdel

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

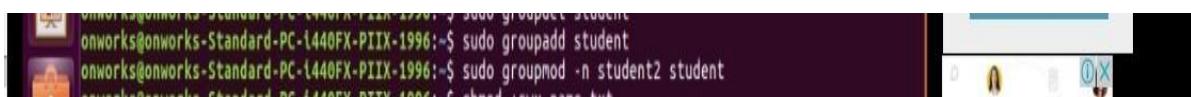


```
onworks@onworks-Standard-PC-L440FX-PIIX-1996:~$ sudo groupdel student
```

### 4. groupmod

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

```
# groupmod -n group1 group2
```



```
onworks@onworks-Standard-PC-L440FX-PIIX-1996:~$ sudo groupdel student  
onworks@onworks-Standard-PC-L440FX-PIIX-1996:~$ sudo groupadd student  
onworks@onworks-Standard-PC-L440FX-PIIX-1996:~$ sudo groupmod -n student2 student
```

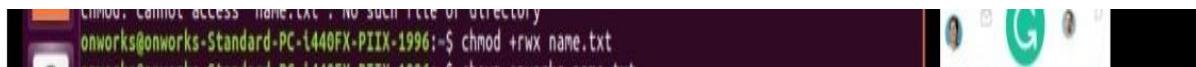
### 5. chmod

- To change directory permissions of file/ Directory in Linux. #chmod whowhatwhich file/directory
- **chmod +rwx filename** To add permissions.
- **chmod -rwx directoryname** To remove permissions.
- **chmod +x filename** To allow executable permissions.
- **chmod -wx filename** to take out write and executable permissions.

```
#chmod u+x test
```

```
#chmod g-rwx test
```

```
#chmod o-r test
```

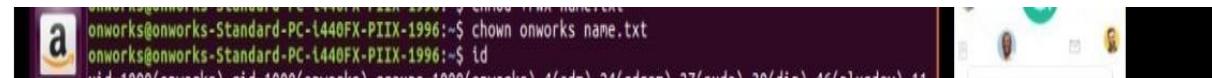


```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ chmod +rwx name.txt
```

## 6. chown

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

```
#chown Tom Test
```

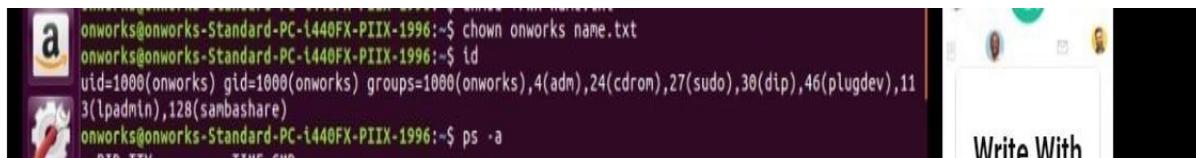


```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ chown onworks name.txt
```

## 7. id

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

```
#id
```



```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ chown onworks name.txt
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id
```

```
uid=1000(onworks) gid=1000(onworks) groups=1000(onworks),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),113(lpadmin),128(sambashare)
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ps -a
```

Write With

## 8. ps

- The ps command, **short for Process S, its a command line utility** that is used to display or view information related to the processes running in a Linux system.
- PID – This is the unique process ID
- TTY – This is the type of terminal that the user is logged in to
- TIME – This is the time in minutes and seconds that the process has been running
- CMD – The command that launched the process #ps -a

9.

onworks@onworks:~\$ top -u onworks

Confidence

top

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

#top -u rose

```
onworks@onworks-Standard-PC-1440FX-PIIX-1996:~$ top -u onworks
top - 16:17:15 up 13 min,  1 user,  load average: 0.00, 0.20, 0.24
Tasks: 164 total,  1 running, 127 sleeping,  0 stopped,  0 zombie
%Cpu(s): 0.8 us, 0.3 sy, 0.0 ni, 98.8 id, 0.0 wa, 0.0 hi, 0.0 st, 0.0 st
KiB Mem : 3024932 total, 451852 free, 513352 used, 2059728 buff/cache
KiB Swap: 998396 total, 998396 free,          0 used. 2147124 avail Mem

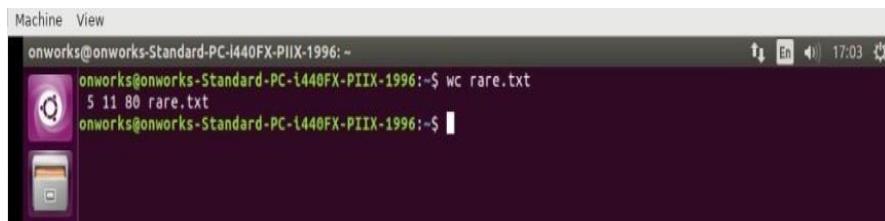
PID USER      PR  NI    VIRT    RES    SHR S %CPU %MEM     TIME+ COMMAND
1661 onworks  20   0 384644 188376 75776 S  1.3  6.2  0:34.98 compiz
1036 onworks  20   0 49964  7372  6616 S  0.3  0.2  0:00.65 ibus-daemon
```

Confidence



## 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.
- #wc state.txt  
6 8 54  
state.txt
- #wc state.txt capital.txt
- wc -l state.txt
- wc -w state.txt capital.txt
- wc -c state.txt
- wc -m state.txt



The screenshot shows a terminal window titled "Machine View". The command "wc rare.txt" is run, resulting in the output "5 11 80 rare.txt". The terminal interface includes a title bar with "Machine View" and a system tray icon. The desktop environment visible in the background includes icons for a terminal, file manager, and system settings.

## 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
- Options:
  - c : Creates Archive
  - x : Extract the archive
  - f : creates archive with given filename

- t : displays or lists files in archived file
- u : archives and adds to an existing archive file
- v : Displays Verbose Information
- A : Concatenates the archive files
- z : zip, tells tar command that creates tar file using gzip
- j : filter archive tar file using tbzip
- W : Verify a archive file
- r : update or add file or directory in already existed .tar file

```
#tar cf archive.tar state.txt capital.txt //create archive file
#ls archive.tar
#tar tf /archive.tar // list contents of tar archive file
• Extract an archive created with
tar #mkdir backup
#cd backup
#tar xf/home/meera/Documents/Meera_Linux/archive.tar
```

**• Compression Types**

```
gzip(z),bzip2(j), xz(J)
#tar czf /abc.tar.gz /etc
#tar cjf /abcd.tar.bz2 /etc
#tar cJf /abcde.tar.xz
```

**/etc Extract an archive #mkdir**

```
backup1
#cd backup1
#tar xzf /abc.tar.gz
#mkdir backup2
#cd backup2
#tar xjf /abcd.tar.bz2
#mkdir backup3
#cd backup3
#tar xJf /abcde.tar.xz
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~ onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ tar cf archive1.tar quick.txt rare.txt
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
archive1.tar  Documents  examples.desktop  Pictures  quick.txt  Templates
Desktop        Downloads  Music           Public    rare.txt   Videos
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

### 3. expr

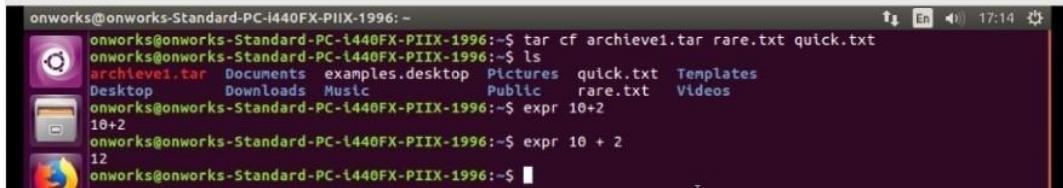
- The **expr** command evaluates a given expression and displays its corresponding output. It is used for:

- Basic operations like addition, subtraction, multiplication, division,

and modulus on integers.

- Evaluating regular expressions, string operations like substring, length of strings etc.
- Performing operations on variables inside a shell script

```
#expr 10 + 2
```



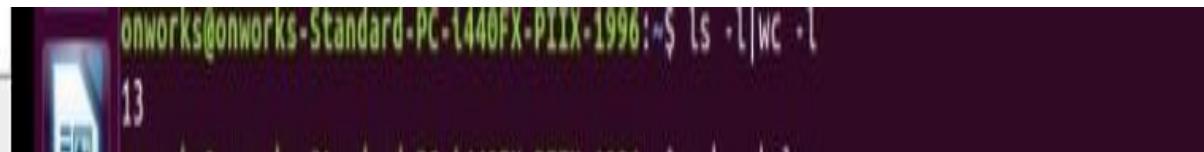
A screenshot of a Linux terminal window titled "onworks@onworks-Standard-PC-i440FX-PIIX-1996:~". The terminal shows the following commands and output:  
\$ tar cf archive1.tar rare.txt quick.txt  
\$ ls  
archive1.tar Documents examples.desktop Pictures quick.txt Templates  
Desktop Downloads Music Public rare.txt Videos  
\$ expr 10+2  
12  
\$ expr 10 + 2  
12  
\$

## 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.

```
#ls -l | wc -l
```

```
#cat /etc/passwd.txt | head -7 | tail -5
```



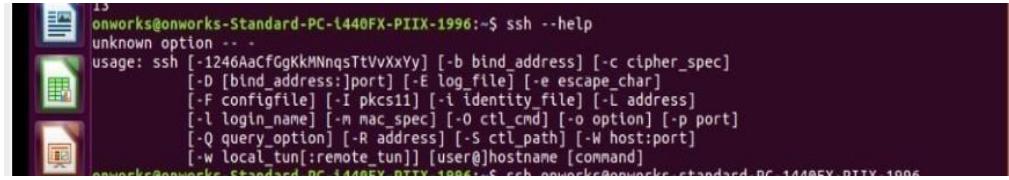
A screenshot of a Linux terminal window titled "onworks@onworks-Standard-PC-i440FX-PIIX-1996:~". The terminal shows the following command and its output:  
\$ ls -l | wc -l  
13

## 5. ssh

- **ssh**stands for “**S**ecure **sh**.**e**ll”
- It is a protocol used to securely connect to a remote server/system.
- ssh is secure in the sense that it transfers the data in encrypted form between the host and the client.
- It transfers inputs from the client to the host and relays back the output. ssh runs at TCP/IP port 22.

```
#ssh user_name@host(IP/Domain_name)
```

```
#ssh -X root@server1.example.com
```



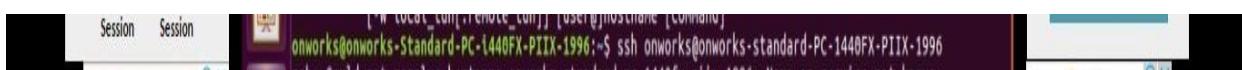
```
onworks@onworks-Standard-PC-1440FX-PIIX-1996:~$ ssh --help
unknown option --
usage: ssh [-1246AaCfgKkMNnqsTtVvXxYy] [-b bind_address] [-c cipher_spec]
           [-D [bind_address:]port] [-E log_file] [-e escape_char]
           [-F configfile] [-I pkcs11] [-i identity_file] [-L address]
           [-l login_name] [-m mac_spec] [-O ctl_cmd] [-o option] [-p port]
           [-Q query_option] [-R address] [-S ctl_path] [-W host:port]
           [-w local_tun[:remote_tun]] [user@]hostname [command]
onworks@onworks-Standard-PC-1440FX-PIIX-1996:~$ ssh onworks@onworks-standard-PC-1440FX-PIIX-1996
```

## 6. scp

- SCP (secure copy) is a command-line utility that allows you to securely copy files and directories between two locations.
- With scp, you can copy a file or directory:
- From your local system to a remote system.
- From a remote system to your local system.
- Between two remote systems from your local system.
- Remote file system locations are specified in format [user@]host:/path

Syntax:

```
scp [OPTION] [user@]SRC_HOST:]file1 [user@]DEST_HOST:]file2
$scp/etc/yum.config/etc/hosts ServerX:/home/student
$scp ServerX:/etc/hostname /home/student
```



## 7. ssh-keygen

- ssh-keygen command to generate a public/private authentication key pair. Authentication keys allow a user to connect to a remote system without supplying a password. Keys must be generated for each user separately. If you generate key pairs as the root user, only the root can use the keys.

```
$ssh-keygen -t rsa
```

 onworks@onworks-Standard-PC-(440FX-PTX-1996:~\$ ssh -keygen  
Bad access character !unav!

## 8. ssh-copy-id

- The ssh-copy-id command allows you to install an SSH key on a remote server's authorized keys.
- This command facilitates SSH key login, which removes the need for a password for each login, thus ensuring a password-less, automatic login process.

\$ssh-copy-id username@remote\_host

## Q.No Questions

### 1. Lab Assignment Managing Files, Creating Users and Groups Using Command-line tools

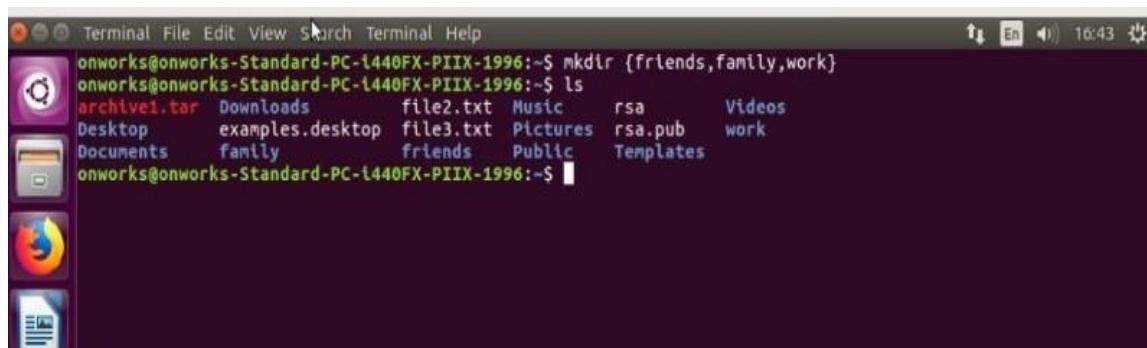
- 1.a. Create six files with name of the form songX.mp3
- b. Create six files with name of the form snapX.mp3
- c. Create six files with name of the form filmX.mp3 (In each set, replace X with the numbers 1 through 6)

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch song1.mp3 song2.mp3 song3.mp3 song4.mp3 song5.mp3 song6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch snap1.mp3 snap2.mp3 snap3.mp3 snap4.mp3 snap5.mp3 snap6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ touch film1.mp3 film2.mp3 film3.mp3 film4.mp3 film5.mp3 film6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
Desktop          film2.mp3  Music      snap3.mp3  song2.mp3  Templates
Documents        film3.mp3  Pictures   snap4.mp3  song3.mp3  Videos
Downloads        film4.mp3  Public     snap5.mp3  song4.mp3
examples.desktop film5.mp3  snap1.mp3  snap6.mp3  song5.mp3
film1.mp3        film6.mp3  snap2.mp3  song1.mp3  song6.mp3
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

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.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv song1.mp3 ./Music/
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv song2.mp3 song3.mp3 song4.mp3
song5.mp3 song6.mp3 ./Music/
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv snap1.mp3 snap2.mp3 snap4.mp3
snap5.mp3 snap6.mp3 ./Pictures/
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mv film1.mp3 film2.mp3 film3.mp3
film4.mp3 film5.mp3 film6.mp3 ./Videos/
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

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.



The screenshot shows a Linux desktop environment. On the left, there's a file manager window with icons for archive1.tar, Downloads, file2.txt, Music, rsa, Videos, Desktop, examples.desktop, file3.txt, Pictures, rsa.pub, work, Documents, family, friends, Public, and Templates. On the right, a terminal window is open with the following session:

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ mkdir {friends,family,work}
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls
archive1.tar  Downloads  file2.txt  Music    rsa      Videos
Desktop       examples.desktop  file3.txt  Pictures  rsa.pub  work
Documents     family      friends    Public   Templates
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

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

```
mkolr: cannot create directory w : File exists
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp Music/song2.mp3 Music/song3.mp3 Music/song4.mp3 Music/
song5.mp3 Music/song6.mp3 friends
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cp Pictures/snap2.mp3 Pictures/snap3.mp3 Pictures/snap4.m
p3 Pictures/snap5.mp3 Pictures/snap6.mp3 family
```

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

```
rm -r p3 Pictures/snap2.mp3 Pictures/snap3.mp3 Pictures/snap4.mp
3 Pictures/snap5.mp3 Pictures/snap6.mp3 family
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rmdir family friends
rmdir: failed to remove 'family': Directory not empty
rmdir: failed to remove 'friends': Directory not empty
```

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

```
rm -r p3 Pictures/snap2.mp3 Pictures/snap3.mp3 Pictures/snap4.mp
3 Pictures/snap5.mp3 Pictures/snap6.mp3 family
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ rm -r family friends
```

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

```
ls -a >allfiles.txt
ls
allfiles.txt  Documents examples.desktop Pictures song1.mp3 Templates w
Desktop  Downloads Music Public song6pm3 Videos work
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ ls -al
total 120
drwxr-xr-x  18 onworks onworks 4096 Aug 17 18:18 .
drwxr-xr-x  3 root   root    4096 Mai  5  2019 ..
-rw-rw-r--  1 onworks onworks  306 Aug 17 18:18 allfiles.txt
-rw-r--r--  1 onworks onworks  94 Mai 31  2019 .bash_history
-rw-r--r--  1 onworks onworks 220 Mai  5  2019 .bash_logout
-rw-r--r--  1 onworks onworks 3771 Mai  5  2019 .bashrc
drwxr-xr-x  11 onworks onworks 4096 Mai  5  2019 .cache
drwxr-xr-x  3 onworks onworks 4096 Mai  5  2019 .compiz
drwxr-xr-x  14 onworks onworks 4096 Mai  5  2019 .config
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Desktop
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Documents
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Downloads
-rw-r--r--  1 onworks onworks 8980 Mai  5  2019 examples.desktop
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 .gconf
drwxr-xr-x  3 onworks onworks 4096 Aug  30 2019 .gnupg
-rw-r--r--  1 onworks onworks 3496 Aug  30 2019 .ICEauthority
drwxr-xr-x  3 onworks onworks 4096 Mai  5  2019 .local
drwxr-xr-x  2 onworks onworks 4096 Aug 17 18:09 Music
drwxr-xr-x  2 onworks onworks 4096 Aug 17 18:12 Pictures
-rw-r--r--  1 onworks onworks  655 Mai  5  2019 .profile
drwxr-xr-x  2 onworks onworks 4096 Mai  5  2019 Public
```

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

```
date
Dl 17. Aug 18:20:59 CEST 2021
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd juliet
```

9. Add the user Juliet

```
date
Dl 17. Aug 18:20:59 CEST 2021
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd juliet
[sudo] password for onworks:
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/passwd
```

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

```
[sudo] password for onworks:  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ 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:/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
```

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

```
juliet:x:1001:1001::/home/juliet:  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo passwd juliet  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd -g 3000 shakespeare
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd -g 3000 shakespeare  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd -g 2000 artists
```

13. Create a supplementary group called artists.

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd -g 3000 shakespeare  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd -g 2000 artists  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/group
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo groupadd -g 2000 artists  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/group  
root:x:0:  
daemon:x:1:  
bin:x:2:  
sys:x:3:  
adm:x:4:syslog, onworks  
tty:x:5:  
disk:x:6:  
lp:x:7:  
mail:x:8:  
news:x:9:  
uucp:x:10:  
...:x:12:
```

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$  
avahi-autolpd:x:119:  
avahi:x:120:  
bluetooth:x:121:  
scanner:x:122:saned  
colord:x:123:  
pulse:x:124:  
pulse-access:x:125:  
rtkit:x:126:  
saned:x:127:  
onworks:x:1000:  
sambashare:x:128:onworks  
juliet:x:1001:  
shakespeare:x:3000:  
artists:x:2000:
```

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

```
artists:x:2000:  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ groups juliet  
juliet : juliet  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -a -G shakespeare juliet  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id juliet
```

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

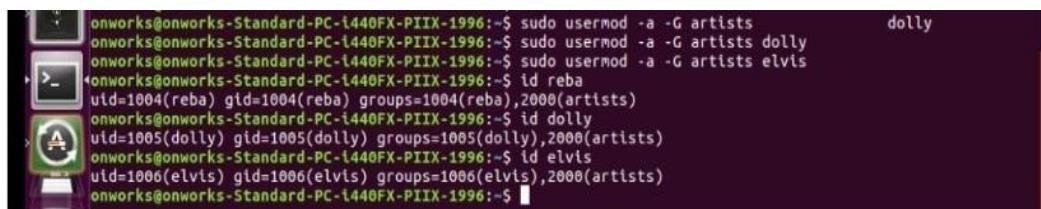
```
uid=1001(juliet) gid=1001(juliet) groups=1001(juliet),3000(shakespeare)  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod romeo
```

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

```
usermod: user 'romeo' does not exist  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd romeo  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd hamlet  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -a -G shakespeare romeo  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -a -G shakespeare hamlet  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id romeo  
uid=1002(romeo) gid=1002(romeo) groups=1002(romeo),3000(shakespeare)  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id hamlet  
uid=1003(hamlet) gid=1003(hamlet) groups=1003(hamlet),3000(shakespeare)  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd seba
```

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

```
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -a -G shakespeare hamlet  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id romeo  
uid=1002(romeo) gid=1002(romeo) groups=1002(romeo),3000(shakespeare)  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ id hamlet  
uid=1003(hamlet) gid=1003(hamlet) groups=1003(hamlet),3000(shakespeare)  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd reba  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd dolly  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo useradd elvis  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ sudo usermod -a -G artists reba
```



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

```
uid=1006(elvis) gid=1006(elvis) groups=1006(elvis),2000(artists)  
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ cat /etc/group  
root:x:0:  
daemon:x:1:  
bin:x:2:  
sys:x:3:  
adm:x:4:syslog,onworks  
tty:x:5:  
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:onworks  
floppy:x:25:  
tape:x:26:
```

```
users:x:100:
nogroup:x:65534:
systemd-journal:x:101:
systemd-timesync:x:102:
systemd-network:x:103:
systemd-resolve:x:104:
systemd-bus-proxy:x:105:
input:x:106:
crontab:x:107:
syslog:x:108:
netdev:x:109:
messagebus:x:110:
uuidd:x:111:
ssl-cert:x:112:
lpadmin:x:113:onworks
lightdm:x:114:
nopasswdlogin:x:115:
ssh:x:116:
whoopsie:x:117:
mlocate:x:118:
avahi-autoipd:x:119:
avahi:x:120:
bluetooth:x:121:
scanner:x:122:saned
colord:x:123:
pulse:x:124:
pulse-access:x:125:
rtkit:x:126:
saned:x:127:
onworks:x:1000:
sambashare:x:128:onworks
juliet:x:1001:
shakespeare:x:3000:juliet,romeo,hamlet
artists:x:2000:reba,dolly,elvis
romeo:x:1002:
hamlet:x:1003:
reba:x:1004:
dolly:x:1005:
elvis:x:1006:

```

20. Attempt to remove user Dolly.

```
elvis:x:1006:
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$ userdel -r dolly
userdel: Permission denied.
userdel: cannot lock /etc/passwd; try again later.
onworks@onworks-Standard-PC-i440FX-PIIX-1996:~$
```

## Commands in windows and linux

### 1. Ping

```
Windows Command Prompt
Microsoft Windows [Version 10.0.10240]
(c) 2015 Microsoft Corporation. All rights reserved.

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 5005 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>
```

```
haritha@haritha-VirtualBox:~$ 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_se
q=1 ttl=56 time=114 ms
64 bytes from edge-star-mini-shv-01-tir2.facebook.com (157.240.228.35): icmp_se
```

## 2. route

```
on Command Prompt
  -P           Ping a Hyper-V Network Virtualization provider address.
  -4           Force using IPv4.
  -6           Force using IPv6.

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 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.
```

```
haritha@haritha-VirtualBox:~$ 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
```

### 3. tracert

```
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>
```

```
Processing triggers for man-db (2.9.1-1) ...  
haritha@haritha-VirtualBox:~$ 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)  1.568 ms  0.761 ms  1.895 ms  
 2 _gateway (10.0.2.2)  34.044 ms  33.411 ms  33.097 ms
```

### 4. nslookup

```
Force using IPv4.  
  
C:\Users\Admin>nslookup  
Fault Server: Unknown  
Address: 192.168.43.1  
  
-
```

```
Processing triggers for man-db (2.9.1-1) ...  
haritha@haritha-VirtualBox:~$ 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)  1.568 ms  0.761 ms  1.895 ms  
 2 _gateway (10.0.2.2)  34.044 ms  33.411 ms  33.097 ms  
haritha@haritha-VirtualBox:~$ nslookup google.com  
Server: 127.0.0.53  
Address: 127.0.0.53#53  
  
Non-authoritative answer:  
Name: google.com  
Address: 142.250.196.14  
Name: google.com  
Address: 2404:6800:4007:826::200e
```

### 5. ipconfig

```

>
C:\Users\Admin>ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    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 . . . . . : 2402:3a80:1a2d:cb14:49af:3b1:a565:c417
    Temporary IPv6 Address . . . . . : 2402:3a80:1a2d:cb14:dd86:713:d9ac:1ce
    Link-local IPv6 Address . . . . . : fe80::49af:3b1:a565:c417%2
    IPv4 Address . . . . . : 192.168.43.110
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::b6a4:13ff:fe35:30f0%2
                                192.168.43.1

Tunnel adapter isatap.{0B83BF05-F9C0-45F8-BAF1-CBF3F19688AC}:

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

Tunnel adapter Teredo Tunneling Pseudo-Interface:

    Connection-specific DNS Suffix . :
    IPv6 Address . . . . . : 2001:0:348b:fb58:206a:d8e3:d596:e2b4
    Link-local IPv6 Address . . . . . : fe80::206a:d8e3:d596:e2b4%8
    Default Gateway . . . . . :

C:\Users\Admin>_

```

```

haritha@haritha-VirtualBox:~$ 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::1dbc:3da3:bc25:fb9b prefixlen 64 scopeid 0x20<link>
          ether 08:00:27:06:7c:2f txqueuelen 1000 (Ethernet)
            RX packets 606 bytes 318356 (318.3 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 621 bytes 70222 (70.2 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 873 bytes 66220 (66.2 KB)
            RX errors 0 dropped 0 overruns 0 frame 0
            TX packets 873 bytes 66220 (66.2 KB)
            TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

```

## 6. NetStat

```
Default Gateway . . . . .  
C:\Users\Admin>NetStat  
  
Active Connections  
  
Proto Local Address          Foreign Address          State  
TCP   [2402:3a80:1a2d:cb14:dd86:713:d9ac:1ce]:54356  [2001:1900:2381:a04::1fe]:http  ESTABLISHED  
TCP   [2402:3a80:1a2d:cb14:dd86:713:d9ac:1ce]:61194  whatsapp-cdn6-shv-01-maa2:https  ESTABLISHED  
C:\Users\Admin>
```

```
Processing triggers for man-db (2.9.1-1) ...  
haritha@haritha-VirtualBox:~$ 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 [::]:http              [::]:*                LISTEN  
tcp6    0      0 ip6-localhost:ipp       [::]:*                LISTEN  
udp     0      0 0.0.0.0:49205          0.0.0.0:*              LISTEN  
udp     0      0 localhost:domain         0.0.0.0:*              LISTEN  
udp     0      0 0.0.0.0:mdns            0.0.0.0:*              LISTEN
```

**Identify and perform 5 more network commands and it's working.**

## 1. Hostname

To communicate with each and other, the computer needs a unique address. A hostname can be alphabetic or alphanumeric and contain specific symbols used specifically to define a specific node or device in the network. For example, a hostname should have a domain name (TLD) of the top-level and a distance between one and 63 characters when used in a domain name system (DNS) or on the Internet.

```
TCP  [2402:3a80:1a2d:cb14:dd86:713:d9ac:1ce]:54356  [2001:1900:2381:a04::1fe]:http  
TCP  [2402:3a80:1a2d:cb14:dd86:713:d9ac:1ce]:61194  whatsapp  
  
C:\Users\Admin>hostname  
DESKTOP-AU6UMD6  
  
C:\Users\Admin>
```

## 2. *df*

*df* is a standard Unix command used to display the amount of available disk space for file systems on which the invoking user has appropriate read access. *df* is typically implemented using the *statfs* or *statvfs* system calls.

```
haritha@haritha-VirtualBox:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              988244       0   988244   0% /dev
tmpfs             203484   1340   202144   1% /run
/dev/sda5        20123636 8354544  10723796  44% /
tmpfs             1017412       0  1017412   0% /dev/shm
tmpfs               5120       4    5116   1% /run/lock
tmpfs             1017412       0  1017412   0% /sys/fs/cgroup
/dev/loop1          56832   56832       0 100% /snap/core18/2128
/dev/loop0          56832   56832       0 100% /snap/core18/2066
/dev/loop3         224256  224256       0 100% /snap/gnome-3-34-1804/72
/dev/loop2         224256  224256       0 100% /snap/gnome-3-34-1804/66
/dev/loop6          52352   52352       0 100% /snap/snap-store/518
/dev/loop5          66688   66688       0 100% /snap/gtk-common-themes/1515
/dev/loop4          66432   66432       0 100% /snap/gtk-common-themes/1514
/dev/loop7          52224   52224       0 100% /snap/snap-store/547
/dev/loop9          33152   33152       0 100% /snap/snapd/12883
/dev/loop8          33152   33152       0 100% /snap/snapd/12704
/dev/sda1          523248       4   523244   1% /boot/efi
tmpfs             203480      28   203452   1% /run/user/1000
```

## 3. *env*

*env* is a shell command for Unix and Unix-like operating systems. It is used to either print a list of environment variables or run another utility in an altered environment without having to modify the currently existing environment.

```
haritha@haritha-VirtualBox:~$ env
SHELL=/bin/bash
SESSION_MANAGER=local/haritha-VirtualBox:@/tmp/.ICE-unix/1257,unix/haritha-Virt
ualBox:/tmp/.ICE-unix/1257
_WSREP_START_POSITION=
QT_ACCESSIBILITY=1
COLORTERM=truecolor
XDG_CONFIG_DIRS=/etc/xdg/xdg-ubuntu:/etc/xdg
XDG_MENU_PREFIX=gnome-
GNOME_DESKTOP_SESSION_ID=this-is-deprecated
LANGUAGE=en_IN:en
GNOME_SHELL_SESSION_MODE=ubuntu
SSH_AUTH_SOCK=/run/user/1000/keyring/ssh
XMODIFIERS=@im=ibus
DESKTOP_SESSION=ubuntu
SSH_AGENT_PID=1190
GTK_MODULES=gail:atk-bridge
PWD=/home/haritha
LOGNAME=haritha
XDG_SESSION_DESKTOP=ubuntu
XDG_SESSION_TYPE=x11
GPG_AGENT_INFO=/run/user/1000/gnupg/S.gpg-agent:0:1
XAUTHORITY=/run/user/1000/gdm/Xauthority
GJS_DEBUG_TOPICS=JS_ERROR;JS_LOG
```

## 4. Od

od is a command on various operating systems for displaying data in various human-readable output formats. The name is an acronym for "octal dump" since it defaults to printing in the octal data format.

```
haritha@haritha-VirtualBox:~$ od -b file2.txt
0000000 164 150 151 163 040 151 163 040 156 145 164 167 157 162 153 154
0000020 141 142 012 150 157 167 040 141 162 145 040 171 157 165 012 150
0000040 141 166 145 040 141 040 156 151 143 145 040 144 141 171 012 156
0000060 145 164 167 157 162 153 040 151 163 040 163 151 155 160 154 145
0000100 012
0000101
```

## 5. cal

cal will print a calendar of the current month.

```
haritha@haritha-VirtualBox:~$ cal
      September 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
```

## LAMP INSTALLATION

## Install Apache

- Update your system

```
sudo apt update
```

- Install Apache using apt:

```
sudo apt install apache2
```

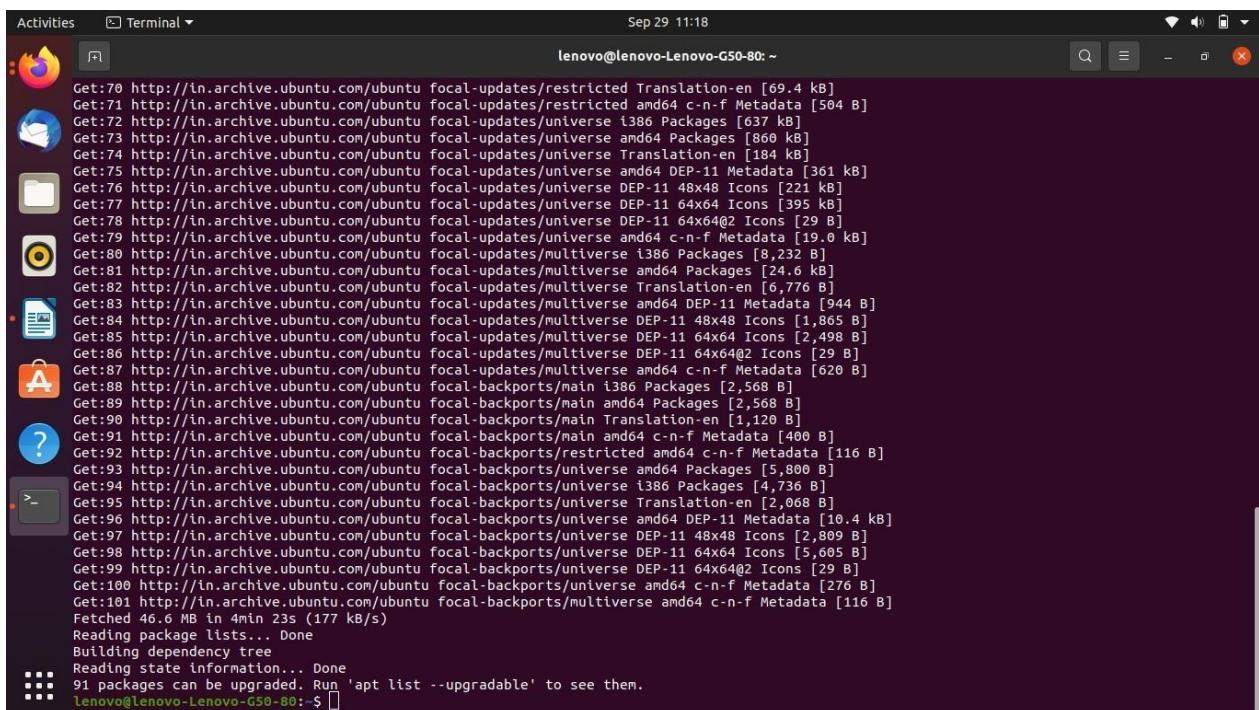
- Confirm that Apache is now running with the following command: sudo systemctl status apache2

- if it is not working

```
sudo systemctl start apache2
```

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

(find out your ip address using ifconfig)



```
Sep 29 11:18
lenovo@lenovo-Lenovo-G50-80: ~
Get:70 http://in.archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [69.4 kB]
Get:71 http://in.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [504 B]
Get:72 http://in.archive.ubuntu.com/ubuntu focal-updates/universe i386 Packages [637 kB]
Get:73 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [860 kB]
Get:74 http://in.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [184 kB]
Get:75 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [361 kB]
Get:76 http://in.archive.ubuntu.com/ubuntu focal-updates/universe DEP-11 48x48 Icons [221 kB]
Get:77 http://in.archive.ubuntu.com/ubuntu focal-updates/universe DEP-11 64x64 Icons [395 kB]
Get:78 http://in.archive.ubuntu.com/ubuntu focal-updates/universe DEP-11 64x64@2 Icons [29 B]
Get:79 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [19.0 kB]
Get:80 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse i386 Packages [8,232 B]
Get:81 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [24.6 kB]
Get:82 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [6,776 B]
Get:83 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 DEP-11 Metadata [944 B]
Get:84 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse DEP-11 48x48 Icons [1,865 B]
Get:85 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse DEP-11 64x64 Icons [2,498 B]
Get:86 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse DEP-11 64x64@2 Icons [29 B]
Get:87 http://in.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 c-n-f Metadata [620 B]
Get:88 http://in.archive.ubuntu.com/ubuntu focal-backports/main i386 Packages [2,568 B]
Get:89 http://in.archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [2,568 B]
Get:90 http://in.archive.ubuntu.com/ubuntu focal-backports/main Translation-en [1,120 B]
Get:91 http://in.archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [400 B]
Get:92 http://in.archive.ubuntu.com/ubuntu focal-backports/restricted amd64 c-n-f Metadata [116 B]
Get:93 http://in.archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [5,800 B]
Get:94 http://in.archive.ubuntu.com/ubuntu focal-backports/universe i386 Packages [4,736 B]
Get:95 http://in.archive.ubuntu.com/ubuntu focal-backports/universe Translation-en [2,068 B]
Get:96 http://in.archive.ubuntu.com/ubuntu focal-backports/universe amd64 DEP-11 Metadata [10.4 kB]
Get:97 http://in.archive.ubuntu.com/ubuntu focal-backports/universe DEP-11 48x48 Icons [2,809 B]
Get:98 http://in.archive.ubuntu.com/ubuntu focal-backports/universe DEP-11 64x64 Icons [5,605 B]
Get:99 http://in.archive.ubuntu.com/ubuntu focal-backports/universe DEP-11 64x64@2 Icons [29 B]
Get:100 http://in.archive.ubuntu.com/ubuntu focal-backports/universe amd64 c-n-f Metadata [276 B]
Get:101 http://in.archive.ubuntu.com/ubuntu focal-backports/multiverse amd64 c-n-f Metadata [116 B]
Fetched 46.6 MB in 4min 23s (177 kB/s)
Reading package lists... Done
Building dependency tree
Reading state information... Done
91 packages can be upgraded. Run 'apt list --upgradable' to see them.
lenovo@lenovo-Lenovo-G50-80: ~
```

## Install MariaDB

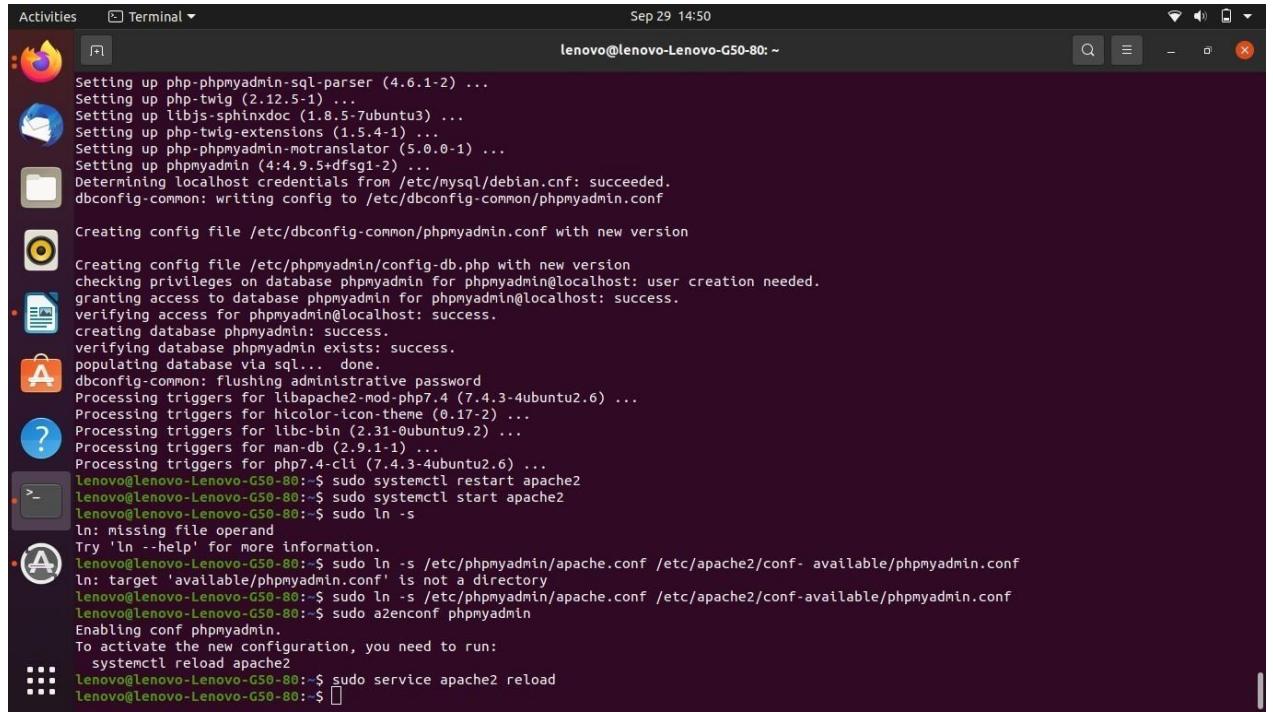
- MariaDB is a fork of MySQL from some of the original MySQL team and is a drop-in replacement.  
`sudo apt install mariadb-server mariadb-client`
- Check mariadb Installation  
`sudo systemctl status mysql`  
(if it is not working `sudo systemctl start mysql`)
- Secure your newly installed MariaDB service:  
`sudo mysql_secure_installation`

(This will set password for mariadb, and strengthen the security by asking

- some questions like disallow root login remotely? Remove test database? Etc)

#### Install PHP and commonly used modules

- `sudo apt install php libapache2-mod-php php-ocache php-cli 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`
- Open a browser  
<http://127.0.0.1/phpinfo.php>



```
Activities Terminal Sep 29 14:50 lenovo@lenovo-Lenovo-G50-80: ~
Setting up php-phpmyadmin-sql-parser (4.6.1-2) ...
Setting up php-twig (2.12.5-1) ...
Setting up libjs-sphinxdoc (1.8.5-7ubuntu3) ...
Setting up php-twig-extensions (1.5.4-1) ...
Setting up php-phpmyadmin-motranslator (5.0.0-1) ...
Setting up phpmyadmin (4:4.9.5+dfsg1-2) ...
Determining localhost credentials from /etc/mysql/debian.cnf: succeeded.
dbconfig-common: writing config to /etc/dbconfig-common/phpmyadmin.conf
Creating config file /etc/dbconfig-common/phpmyadmin.conf with new version
Creating config file /etc/phpmyadmin/config-db.php with new version
checking privileges on database phpmyadmin for phpmyadmin@localhost: user creation needed.
granting access to database phpmyadmin for phpmyadmin@localhost: success.
verifying access for phpmyadmin@localhost: success.
creating database phpmyadmin: success.
verifying database phpmyadmin exists: success.
populating database via sql... done.
dbconfig-common: flushing administrative password
Processing triggers for libapache2-mod-php7.4 (7.4.3-4ubuntu2.6) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for libc-bin (2.31-0ubuntu9.2) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for php7.4-cli (7.4.3-4ubuntu2.6) ...
lenovo@lenovo-Lenovo-G50-80: $ sudo systemctl restart apache2
lenovo@lenovo-Lenovo-G50-80: $ sudo systemctl start apache2
lenovo@lenovo-Lenovo-G50-80: $ sudo ln -s
ln: missing file operand
Try 'ln --help' for more information.
lenovo@lenovo-Lenovo-G50-80: $ sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf-available/phpmyadmin.conf
ln: target '/available/phpmyadmin.conf' is not a directory
lenovo@lenovo-Lenovo-G50-80: $ sudo ln -s /etc/phpmyadmin/apache.conf /etc/apache2/conf-available/phpmyadmin.conf
lenovo@lenovo-Lenovo-G50-80: $ sudo a2enconf phpmyadmin
Enabling conf phpmyadmin.
To activate the new configuration, you need to run:
    systemctl reload apache2
lenovo@lenovo-Lenovo-G50-80: $ sudo service apache2 reload
lenovo@lenovo-Lenovo-G50-80: $
```

### Install phpmyadmin

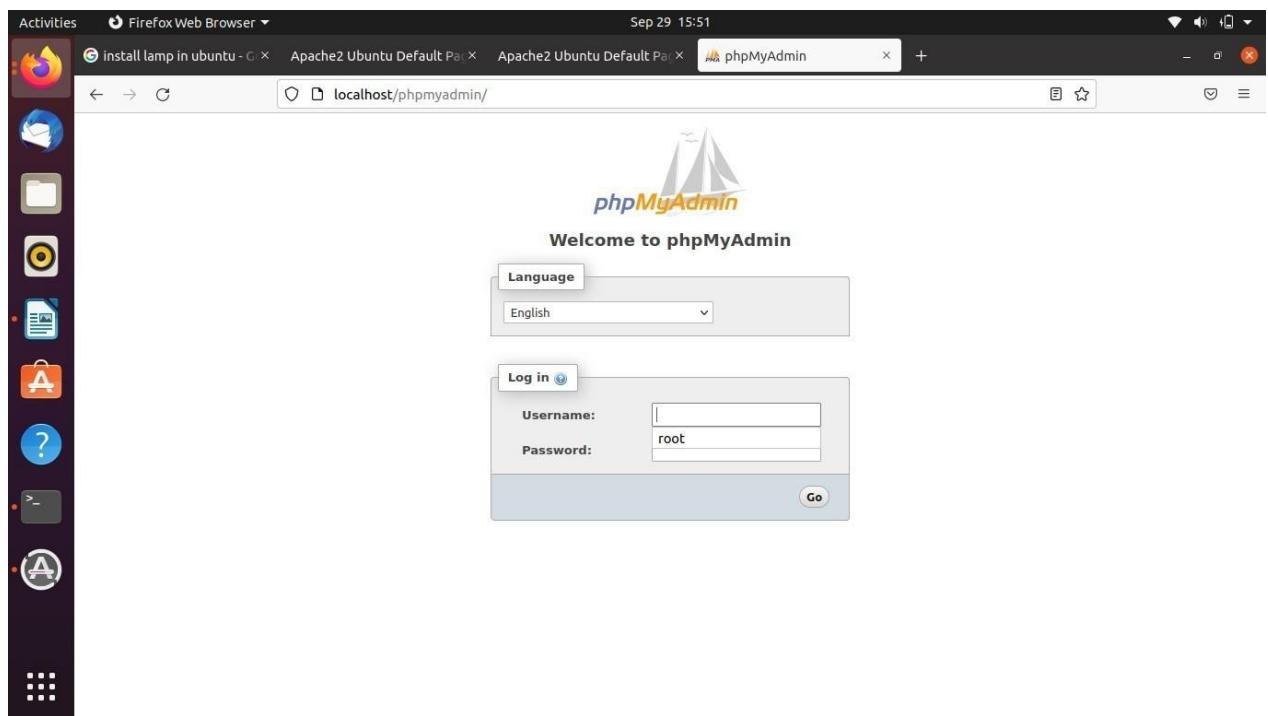
- sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl  
( It ask for webserver select apache2, select db configuration and set password )

### Install phpmyadmin

- Install phpmyadmin  
sudo apt install phpmyadmin php-mbstring php-zip php-gd php-json php-curl  
( It ask for webserver select apache2, select db configuration and set password )
- Restart apache2  
sudo systemctl restart apache2
- Check phpmyadmin
- Open a browser  
<http://localhost/phpmyadmin>

### Install phpmyadmin

- Open a browser  
<http://localhost/phpmyadmin>  
username : root  
password : yourpassword
- If any problem for login run the following  
command sudo mysql  
ALTER USER root@localhost IDENTIFIED BY "yourpassword";



### Install phpmyadmin

If “phpmyadmin is not found error”

```
sudo -H gedit /etc/apache2/apache2.conf
```

Then add the following line to the end of the file:

```
Include /etc/phpmyadmin/apache.conf
```

Then restart apache:

```
sudo systemctl restart apache2
```

Then install phpmyadmin again

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

Activities Firefox Web Browser ▾ Sep 29 16:27

localhost/phpmyadmin/ Server: localhost:3306

**General settings**

- Change password
- Server connection collation: utf8mb4\_unicode\_ci

**Appearance settings**

- Language: English
- Theme: pmahomme
- Font size: 82%
- More settings

**Database server**

- Server: Localhost via UNIX socket
- Server type: MariaDB
- Server connection: SSL is not being used
- Server version: 10.3.31-MariaDB-0ubuntu20.04.1 - Ubuntu 20.04
- Protocol version: 10
- User: phpmyadmin@localhost
- Server charset: UTF-8 Unicode (utf8mb4)

**Web server**

- Apache/2.4.41 (Ubuntu)
- Database client version: libmysql - mysqlnd 7.4.3
- PHP extension: mysqli curl mbstring
- PHP version: 7.4.3

**phpMyAdmin**

- Version information: 4.9.5deb2
- Documentation
- Official Homepage
- Contribute
- Get support
- List of changes

Console

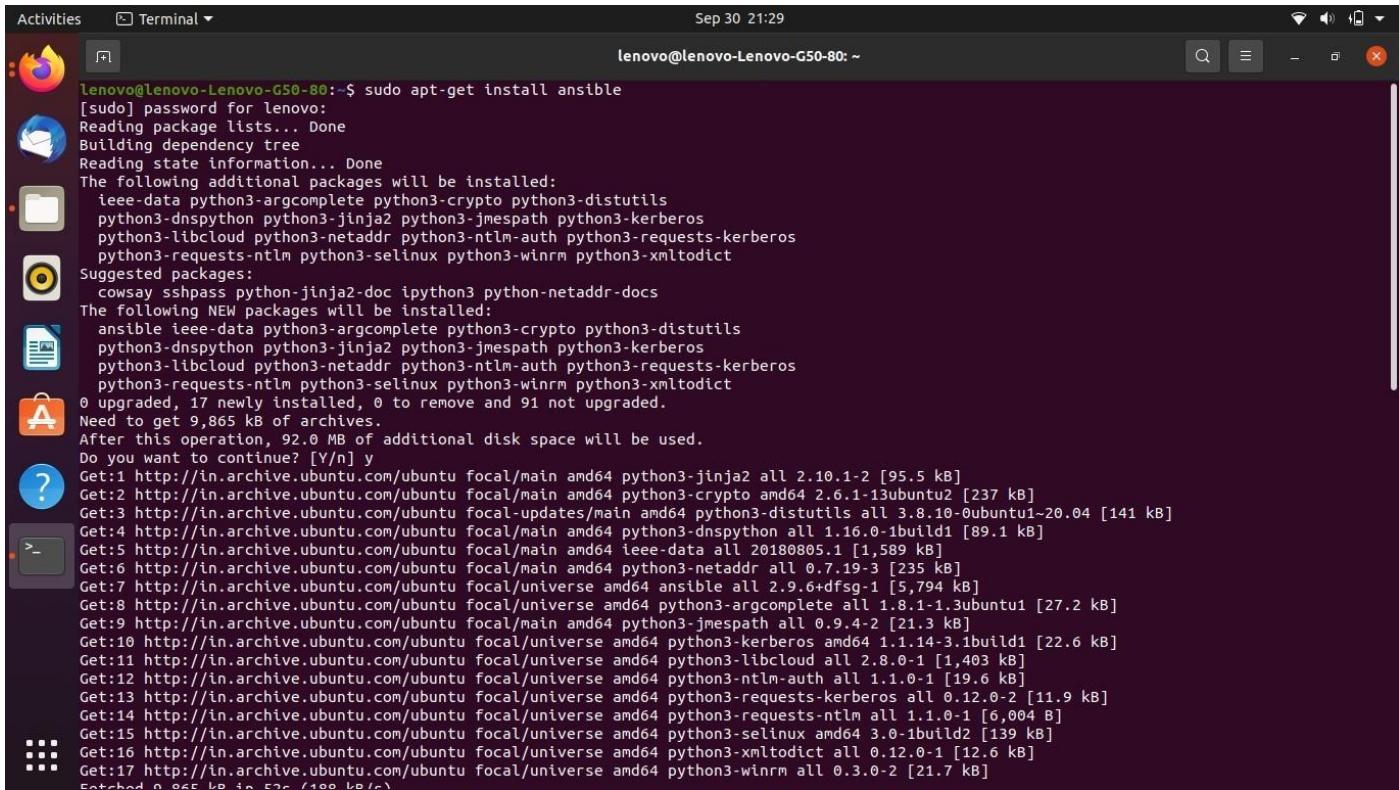
Activities Firefox Web Browser ▾ Sep 29 17:00

localhost/info.php PHP 7.4.3 - phpinfo()

**PHP Version 7.4.3**

System	
Build Date	Aug 13 2021 05:39:12
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.4/apache2/php.ini
Loaded Configuration File	/etc/php/7.4/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.4/apache2/conf.d
Additional .ini files parsed	/etc/php/7.4/apache2/conf.d/10-mysqlind.ini, /etc/php/7.4/apache2/conf.d/10-opcache.ini, /etc/php/7.4/apache2/conf.d/10-pdo.ini, /etc/php/7.4/apache2/conf.d/15-xml.ini, /etc/php/7.4/apache2/conf.d/20-bz2.ini, /etc/php/7.4/apache2/conf.d/20-calendar.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-curl.ini, /etc/php/7.4/apache2/conf.d/20-dom.ini, /etc/php/7.4/apache2/conf.d/20-exif.ini, /etc/php/7.4/apache2/conf.d/20-fil.ini, /etc/php/7.4/apache2/conf.d/20-gd.ini, /etc/php/7.4/apache2/conf.d/20-gettext.ini, /etc/php/7.4/apache2/conf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-json.ini, /etc/php/7.4/apache2/conf.d/20-mbstring.ini, /etc/php/7.4/apache2/conf.d/20-mysqli.ini, /etc/php/7.4/apache2/conf.d/20-phar.ini, /etc/php/7.4/apache2/conf.d/20-shmop.ini, /etc/php/7.4/apache2/conf.d/20-simplexml.ini, /etc/php/7.4/apache2/conf.d/20-sockets.ini, /etc/php/7.4/apache2/conf.d/20-sysmsg.ini, /etc/php/7.4/apache2/conf.d/20-sysvshm.ini, /etc/php/7.4/apache2/conf.d/20-tokenizer.ini, /etc/php/7.4/apache2/conf.d/20-xmleader.ini, /etc/php/7.4/apache2/conf.d/20-xsl.ini, /etc/php/7.4/apache2/conf.d/20-zip.ini
PHP API	20190902
PHP Extension	20190902
Zend Extension	320190902
Zend Extension Build	API320190902.NTS
PHP Extension Build	API20190902.NTS

# Ansible Installation



A screenshot of a Linux desktop environment, likely Ubuntu, showing a terminal window titled "Terminal". The terminal shows the command "sudo apt-get install ansible" being run, along with its output. The output details the package dependencies and the download and installation process from the Ubuntu archive.

```
Activities Terminal Sep 30 21:29 lenovo@lenovo-Lenovo-G50-80: ~
lenovo@lenovo-Lenovo-G50-80:~$ sudo apt-get install ansible
[sudo] password for lenovo:
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-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
0 upgraded, 17 newly installed, 0 to remove and 91 not upgraded.
Need to get 9,865 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]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 python3-distutils all 3.8.10-0ubuntu1~20.04 [141 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-dnspython all 1.16.0-1build1 [89.1 kB]
Get:5 http://in.archive.ubuntu.com/ubuntu focal/main amd64 ieee-data all 20180805.1 [1,589 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-netaddr all 0.7.19-3 [235 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 ansible all 2.9.6+dfsg-1 [5,794 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-argcomplete all 1.8.1-1.3ubuntu1 [27.2 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu focal/main amd64 python3-jmespath all 0.9.4-2 [21.3 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-kerberos amd64 1.1.14-3.1build1 [22.6 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-libcloud all 2.8.0-1 [1,403 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-ntlm-auth all 1.1.0-1 [19.6 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-ntlm all 1.1.0-1 [6,004 B]
Get:15 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-selinux amd64 3.0-1build2 [139 kB]
Get:16 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-xmldict all 0.12.0-1 [12.6 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu focal/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Fetched 9,865 kB in 52s (189 kB/s)

```

```
[■■■] Setting up python3-wchim (0.5.0-2) ...
[■■■] Setting up ansible (2.9.6+dfsg-1) ...
```

## Ansible Version

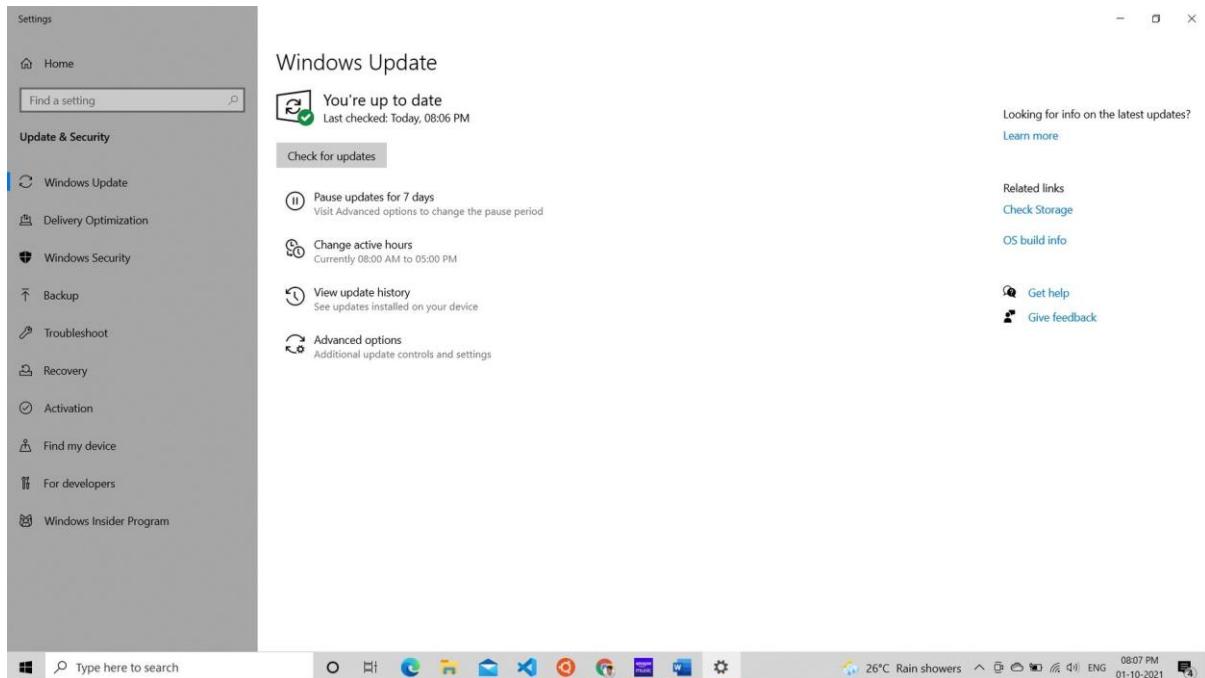
```
Processing triggers for man-db (2.9.1-1) ...
lenovo@lenovo-Lenovo-G50-80:~$ ansible --version
ansible 2.9.6
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/lenovo/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.8.10 (default, Jun  2 2021, 10:49:15) [GCC 9.4.0]
lenovo@lenovo-Lenovo-G50-80:~$ █
```

## **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).

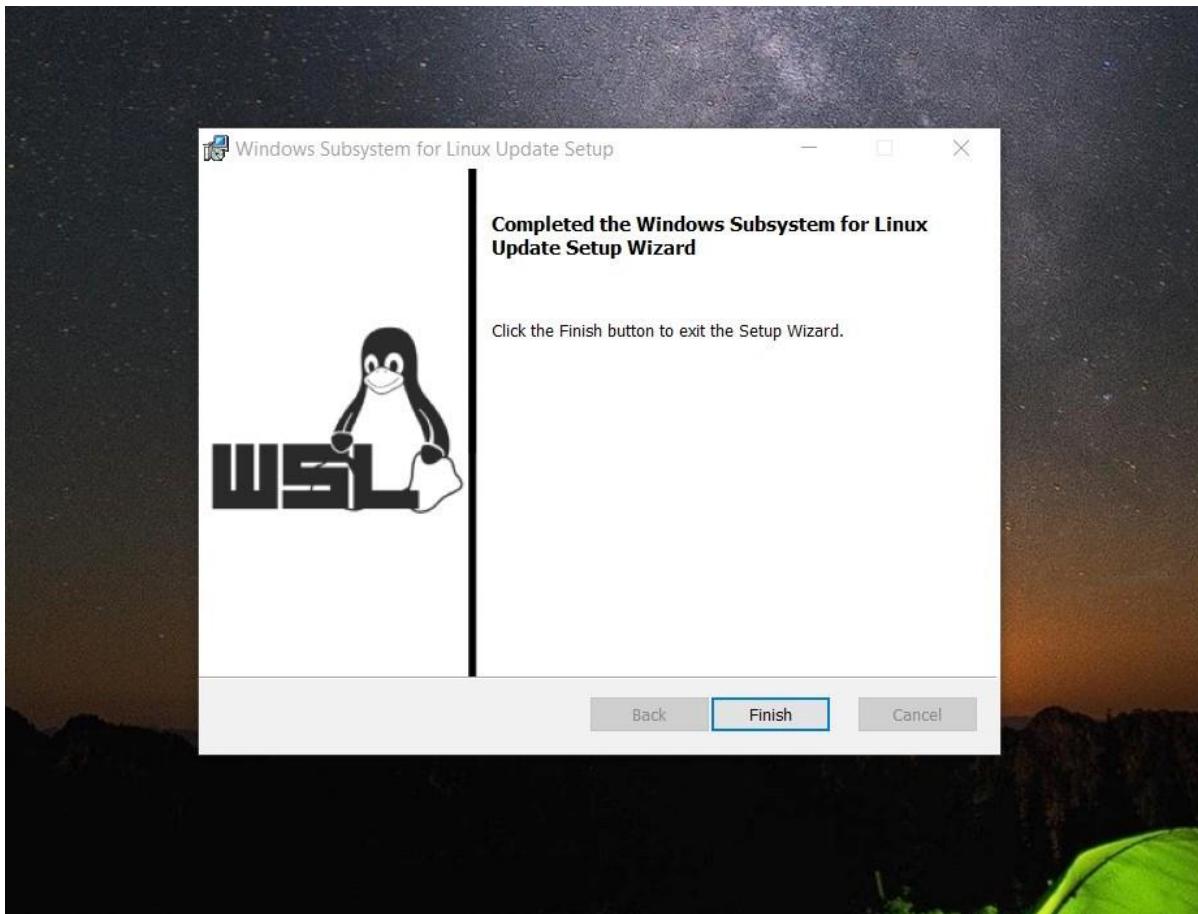
```
Display usage information.
PS C:\Windows\system32> wsl --install
Installing: Virtual Machine Platform
Virtual Machine Platform has been installed.
Installing: Windows Subsystem for Linux
Windows Subsystem for Linux has been installed.
Downloading: WSL Kernel
Installing: WSL Kernel
WSL Kernel has 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)

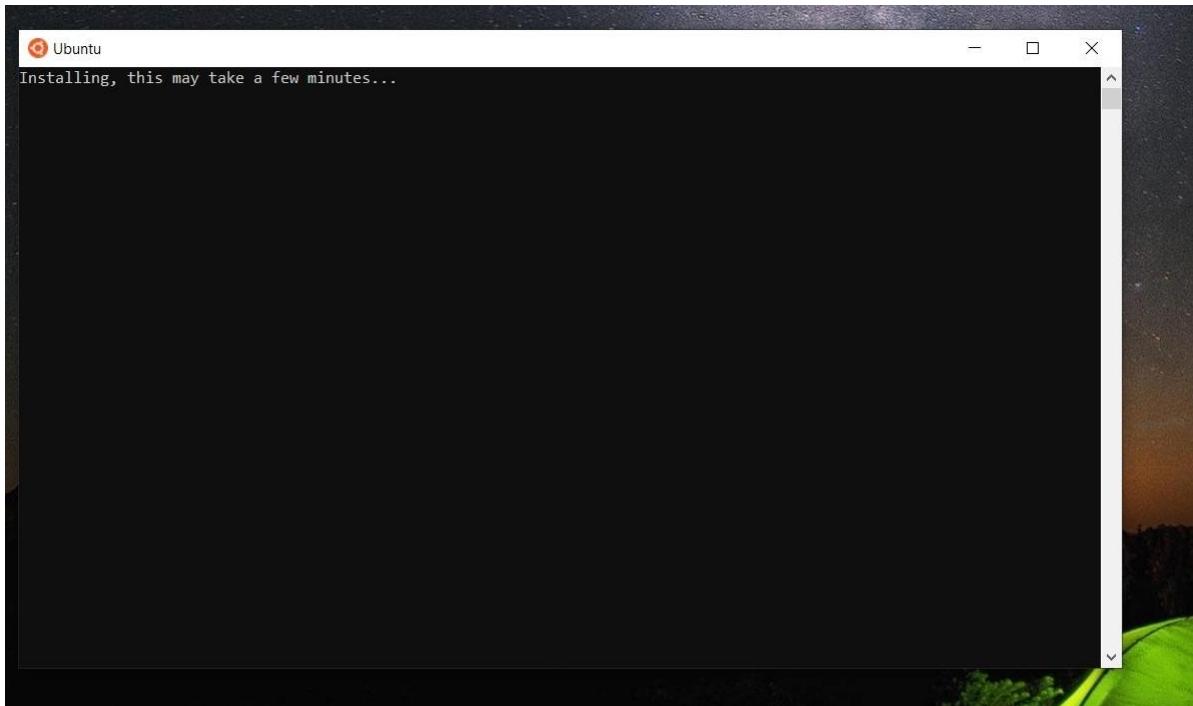
```
"dism.exe /online /enable-feature  
/featurename:VirtualMachinePlatform /all /norestart".
```

```
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.

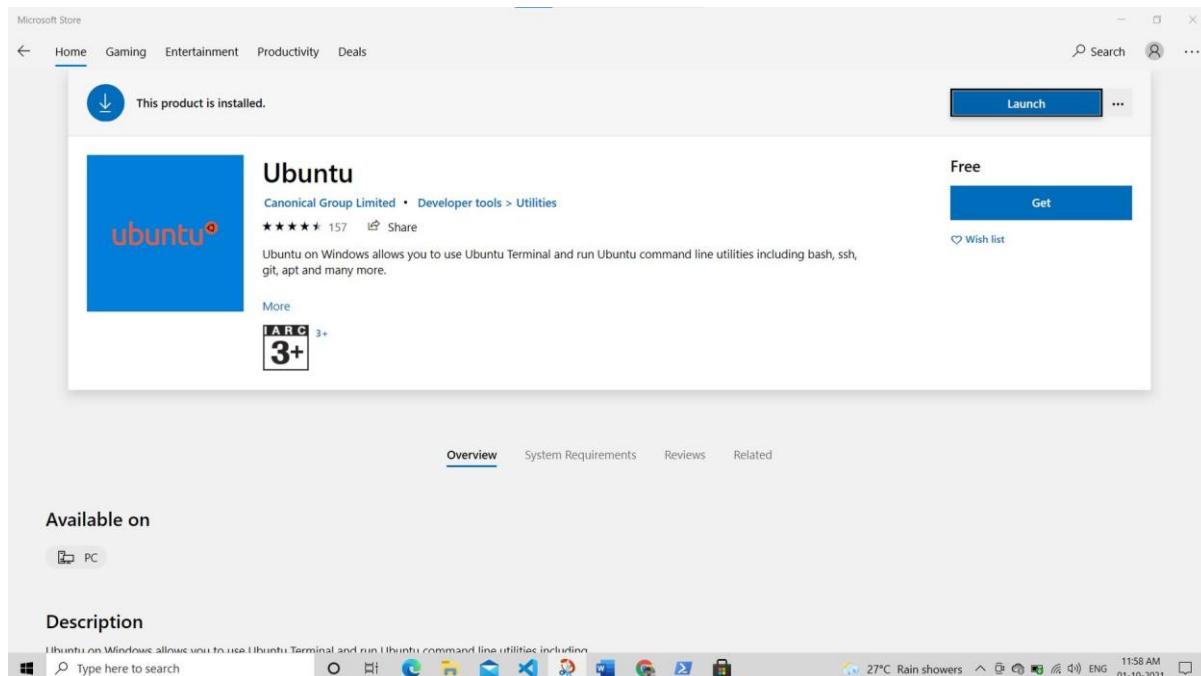
- In the PowerShell window run "**wsl --set-default-version 2**".

```
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.

```
q sam@LAPTOP-2S6KTBFB: ~
o run a command as administrator (user "root"), use "sudo <command>".
e "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 WSL 2
- Add shortcut to desktop

Ok

## Docker Desktop 4.1.0

Unpacking files...

```
Unpacking file: resources/docker-desktop.iso
Unpacking file: resources/ddvp.ico
Unpacking file: resources/config-options.json
Unpacking file: resources/componentsVersion.json
Unpacking file: resources/bin/docker-compose
Unpacking file: resources/bin/docker
Unpacking file: resources/.gitignore
Unpacking file: InstallerCli.pdb
Unpacking file: InstallerCli.exe.config
Unpacking file: frontend/vk_swiftshader_icd.json
Unpacking file: frontend/v8_context_snapshot.bin
Unpacking file: frontend/snapshot_blob.bin
Unpacking file: frontend/resources/regedit/vbs/util.vbs
Unpacking file: frontend/resources/regedit/vbs/regUtil.vbs
```



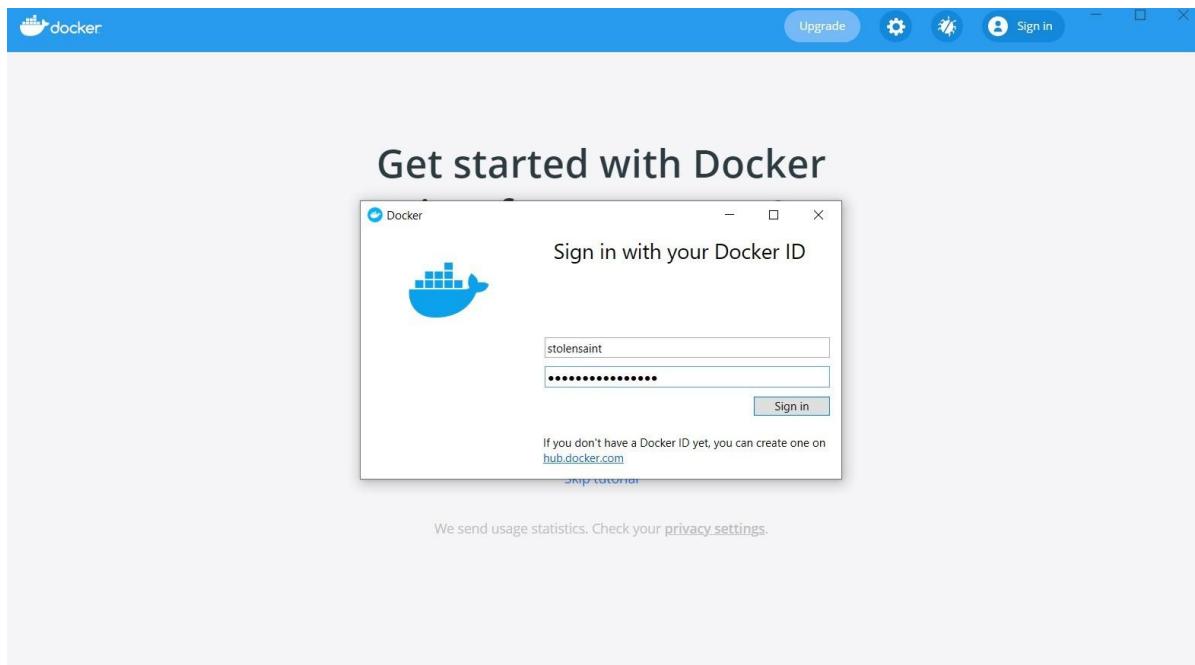
## Docker Desktop 4.1.0

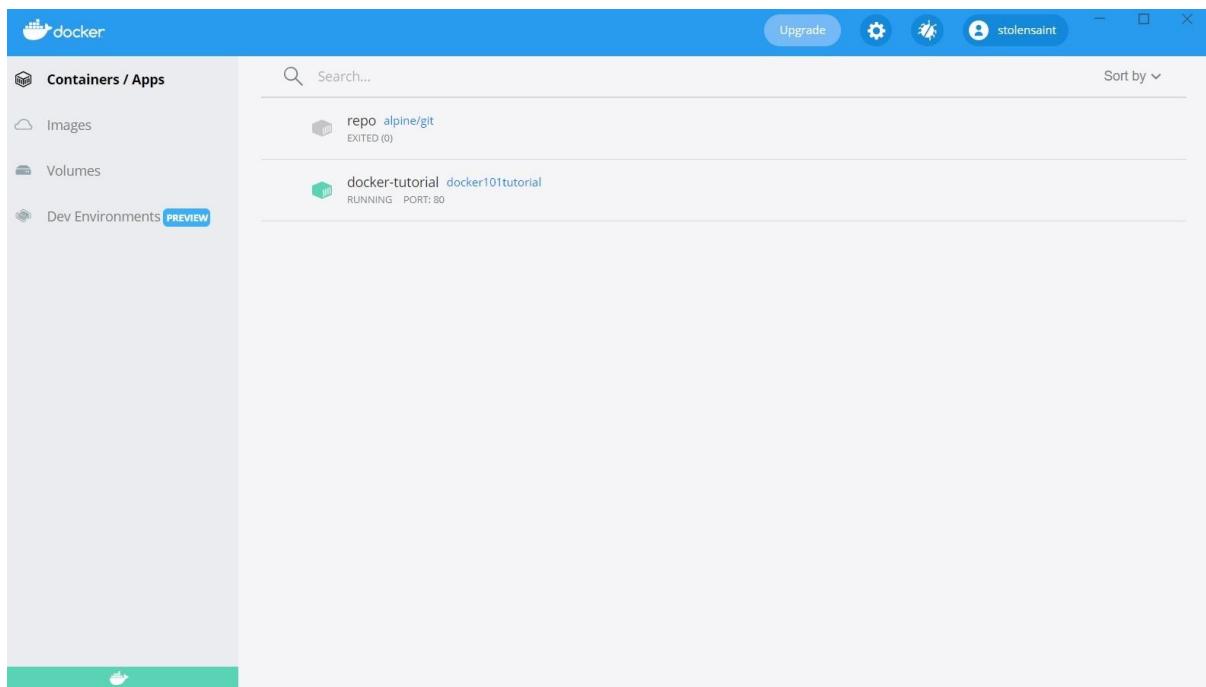
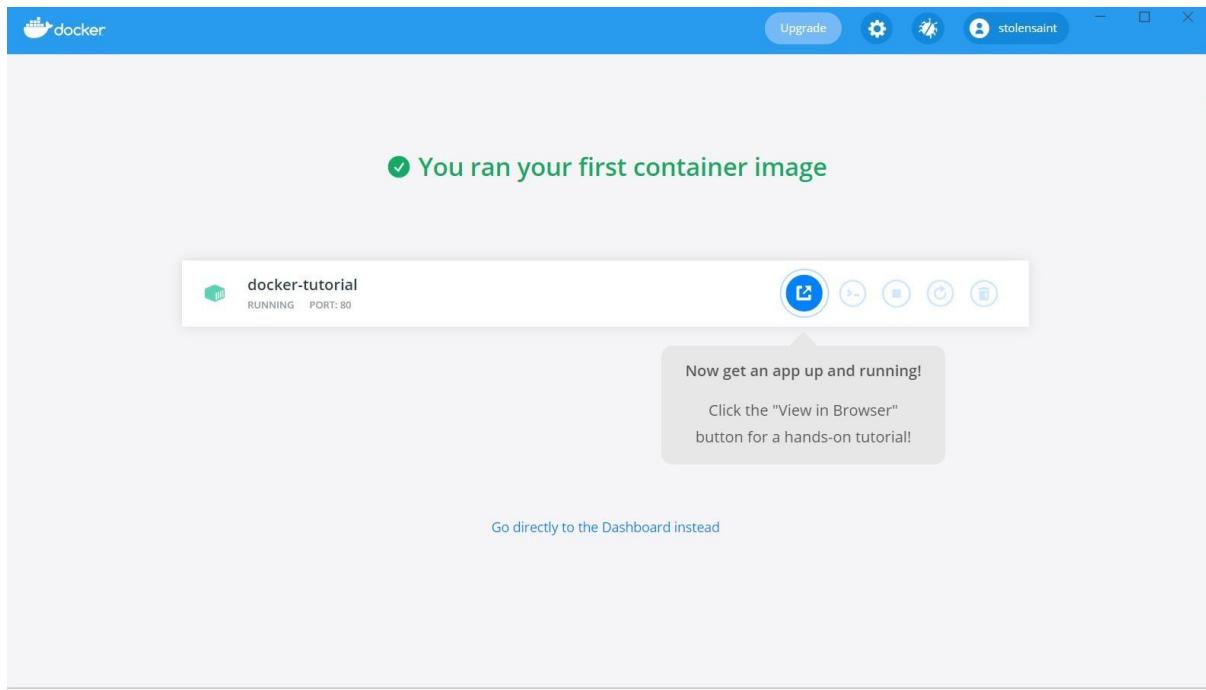
Installation succeeded

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.





- 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.

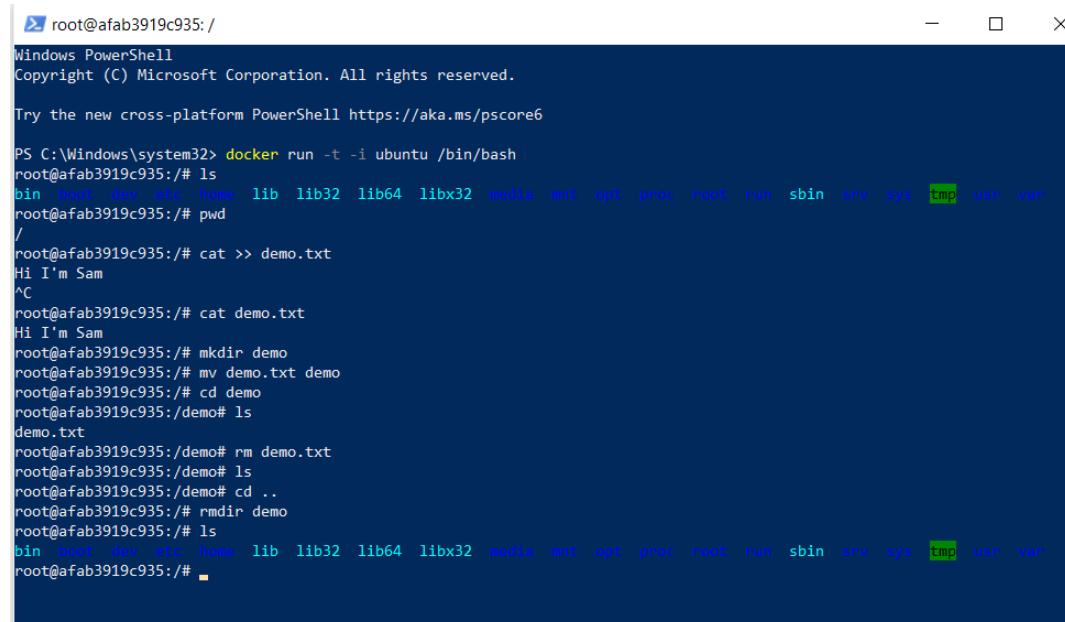
To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

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

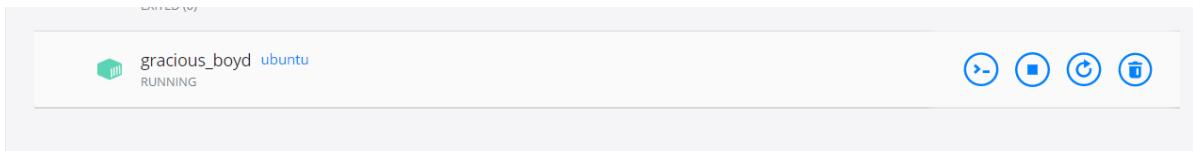
- Run the command “**docker run -t -i ubuntu /bin/bash**” in powershell
- This is a Linux root bash, try some commands



The screenshot shows a Windows PowerShell window with a dark blue background. The title bar says "Windows PowerShell". The command prompt is "PS C:\Windows\system32>". The user is running a Docker container with the command "docker run -t -i ubuntu /bin/bash". Inside the container, the user is at the root prompt "root@afab3919c935:/#". They are performing several Linux commands:

- "ls" lists directory contents: bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr var
- "pwd" shows the current working directory: /
- "cat >> demo.txt" creates a file named "demo.txt" and writes "Hi I'm Sam" to it.
- "cat demo.txt" reads the content of "demo.txt" back.
- "mkdir demo" creates a directory named "demo".
- "mv demo.txt demo" moves the file "demo.txt" into the "demo" directory.
- "cd demo" changes the current working directory to "demo".
- "ls" lists the contents of the "demo" directory: demo.txt
- "rm demo.txt" removes the file "demo.txt".
- "ls" lists the contents of the "demo" directory again, showing it is now empty.
- "rmdir demo" removes the "demo" directory.
- "ls" lists the directory contents again: bin boot dev etc home lib lib32 lib64 libx32 media mnt opt proc root run sbin srv sys tmp usr var

## Docker GUI-Containers



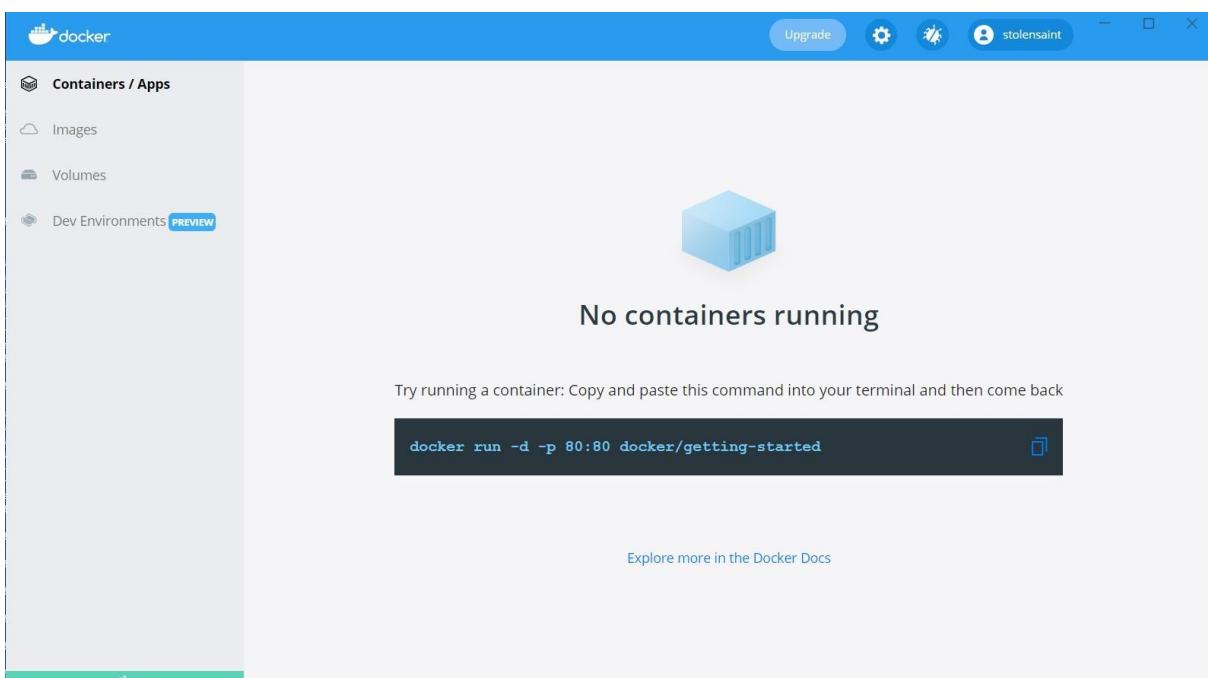
## Removing All Containers

```

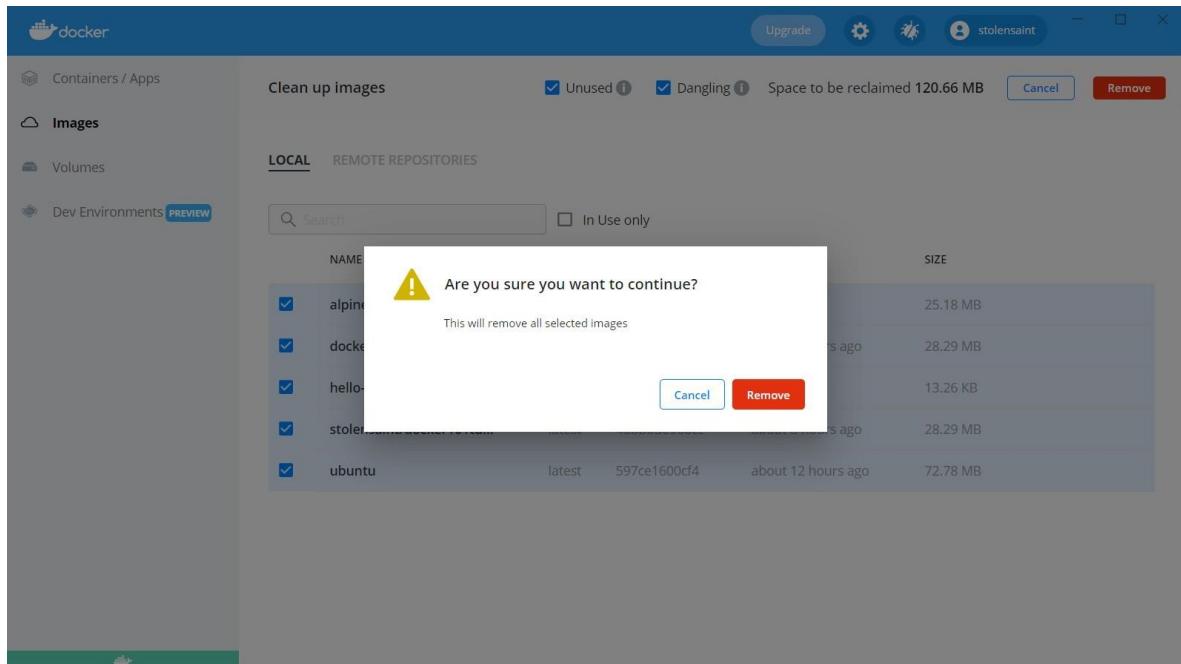
root@afab3919c935:/# exit
exit
PS C:\Windows\system32> docker ps -a
CONTAINER ID   IMAGE      COMMAND      CREATED     STATUS          PORTS     NAMES
gracious_boyd  ubuntu:latest "bash"       6 hours ago  Exited (255) 8 minutes ago
8d21c1d81c22  ubuntu:latest "bash"       6 hours ago  Exited (0) 6 hours ago
1b0186a069a3  ubuntu      "bash"       7 hours ago  Exited (0) 7 hours ago
48ab9a4423d5  ubuntu      "bash"       7 hours ago  Exited (0) 7 hours ago
fd9061619454  ubuntu      "bash"       8 hours ago  Exited (0) 8 hours ago
398156a697cc  hello-world "/hello"    8 hours ago  Exited (0) 8 hours ago
a7e83e3eeda  docker101tutorial "/docker-entrypoint..." 8 hours ago  Exited (0) 7 hours ago
e750d0f55bb4  alpine/git   "git clone https://g..." 8 hours ago  Exited (0) 8 hours ago
repo          alpine/git   "git clone https://g..." 8 hours ago  Exited (0) 8 hours ago
PS C:\Windows\system32>

C:\Windows\system32> alpine/git   "git clone https://g..." 8 hours ago  Exited (0) 8 hours ago
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
1b0186a069a3  ubuntu      "bash"       6 hours ago  Exited (0) 6 hours ago
48ab9a4423d5  ubuntu      "bash"       8 hours ago  Exited (0) 7 hours ago
fd9061619454  ubuntu      "bash"       8 hours ago  Exited (0) 7 hours ago
398156a697cc  hello-world "/hello"    8 hours ago  Exited (0) 8 hours ago
a7e83e3eeda  docker101tutorial "/docker-entrypoint..." 8 hours ago  Exited (0) 8 hours ago
e750d0f55bb4  alpine/git   "git clone https://g..." 8 hours ago  Exited (0) 8 hours ago
PS C:\Windows\system32> docker rm -f gracious_boyd
gracious_boyd
PS C:\Windows\system32> docker rm -f serene_dubinsky
serene_dubinsky
PS C:\Windows\system32> docker rm -f serene_bhaskara
serene_bhaskara
PS C:\Windows\system32> docker rm -f beautiful_tereshkova
beautiful_tereshkova
PS C:\Windows\system32> docker rm -f jolly_torvalds
jolly_torvalds
PS C:\Windows\system32> docker rm -f docker-tutorial
docker-tutorial
PS C:\Windows\system32> docker rm -f repo
repo
PS C:\Windows\system32> docker ps -a
CONTAINER ID   IMAGE      COMMAND      CREATED     STATUS          PORTS     NAMES
PS C:\Windows\system32>

```

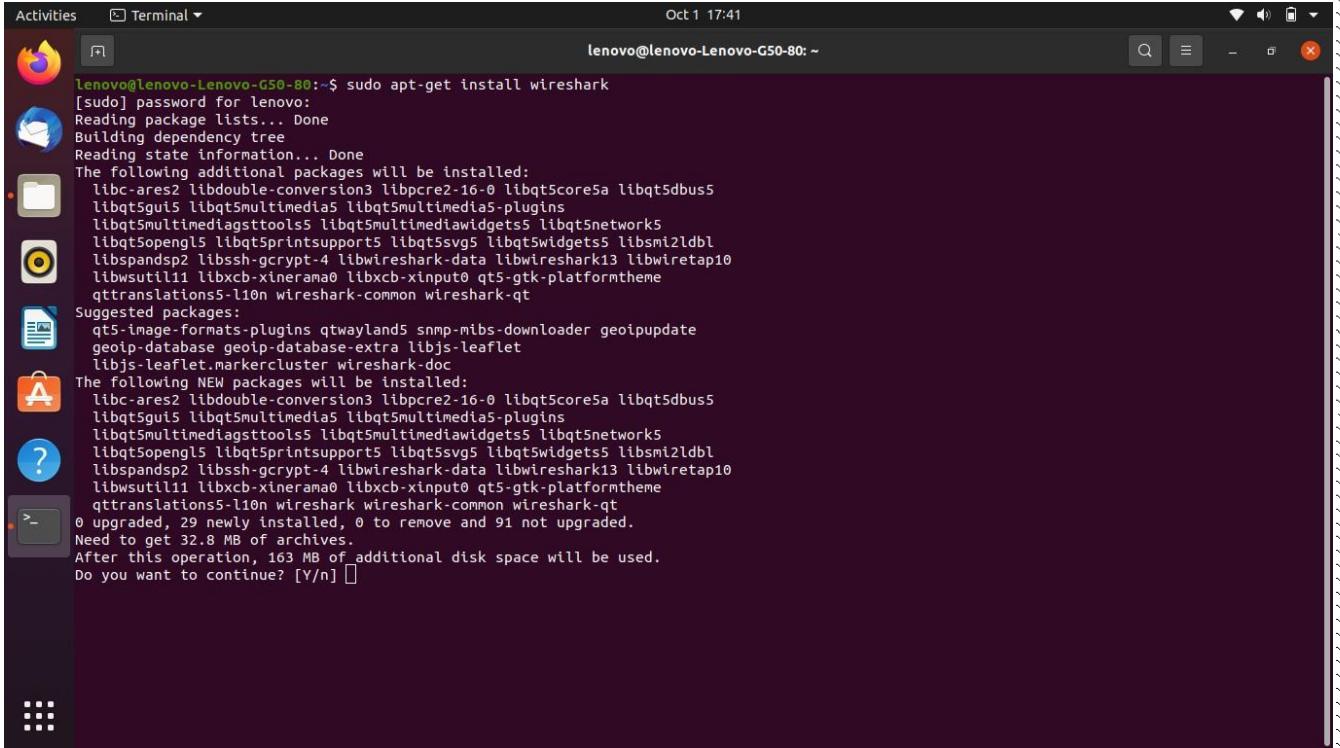


## Cleaning Up Images



## Wireshark for Linux

- sudo apt-get install wireshark



The screenshot shows a terminal window titled "Terminal" with the command "sudo apt-get install wireshark" being run. The output of the command is displayed, showing the installation of Wireshark and its dependencies. The terminal is part of a desktop environment, with a dock on the left containing icons for various applications like a browser, file manager, and terminal.

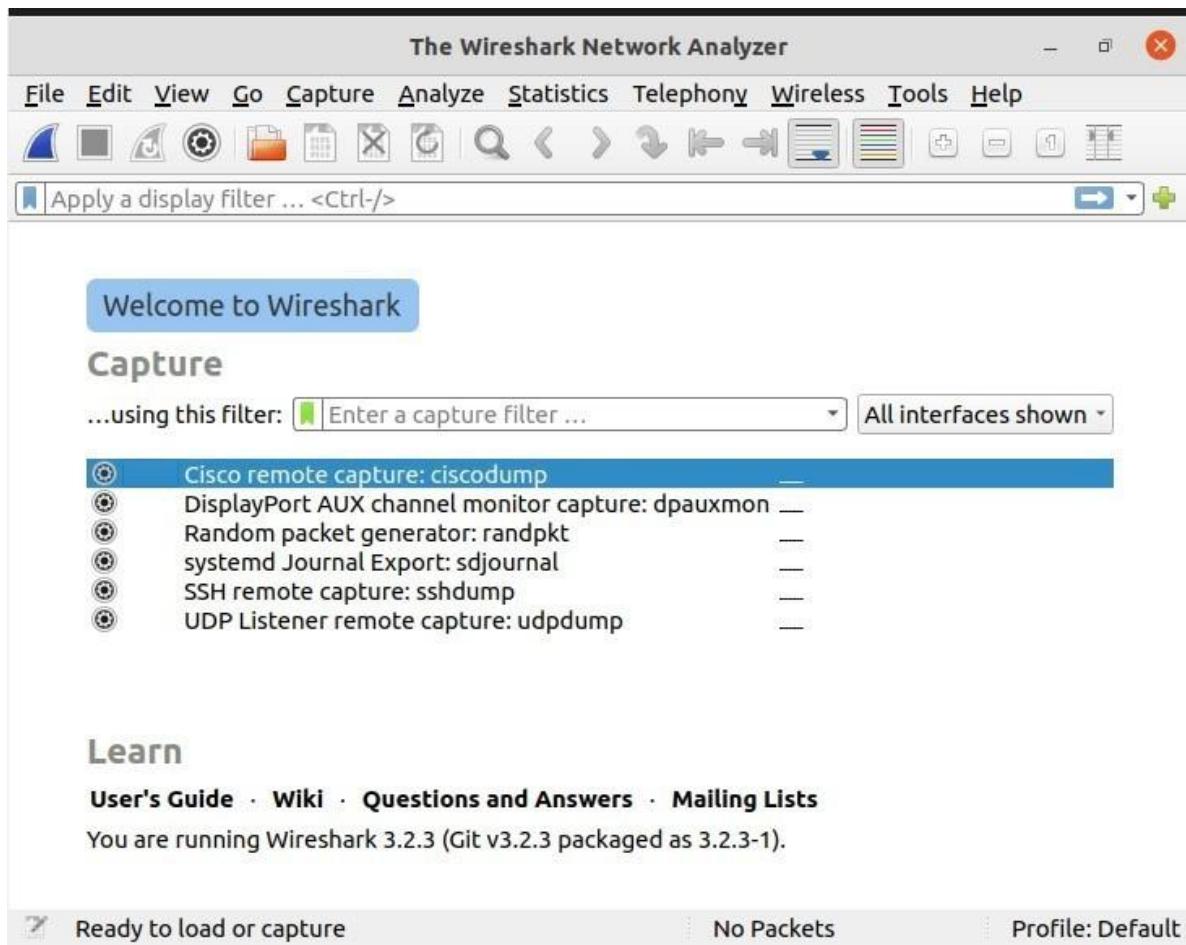
```
lenovo@lenovo-Lenovo-G50-80:~$ sudo apt-get install wireshark
[sudo] password for lenovo:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libc-ares2 libdouble-conversion3 libpcre2-16-0 libqt5core5a libqt5dbus5
  libqt5gui5 libqt5multimedias libqt5multimedia5-plugins
  libqt5multimediasupports libqt5multimediamidgets5 libqt5networks
  libqt5opengl5 libqt5printsupports libqt5svg5 libqt5widgets5 libsmi2l dbus
  libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark3 libwiretap10
  libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme
  qttranslations5-lion 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 libqt5multimedias libqt5multimedia5-plugins
  libqt5multimediasupports libqt5multimediamidgets5 libqt5networks
  libqt5opengl5 libqt5printsupports libqt5svg5 libqt5widgets5 libsmi2l dbus
  libspandsp2 libssh-gcrypt-4 libwireshark-data libwireshark3 libwiretap10
  libwsutil11 libxcb-xinerama0 libxcb-xinput0 qt5-gtk-platformtheme
  qttranslations5-lion wireshark-common wireshark-qt
0 upgraded, 29 newly installed, 0 to remove and 91 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] 
```

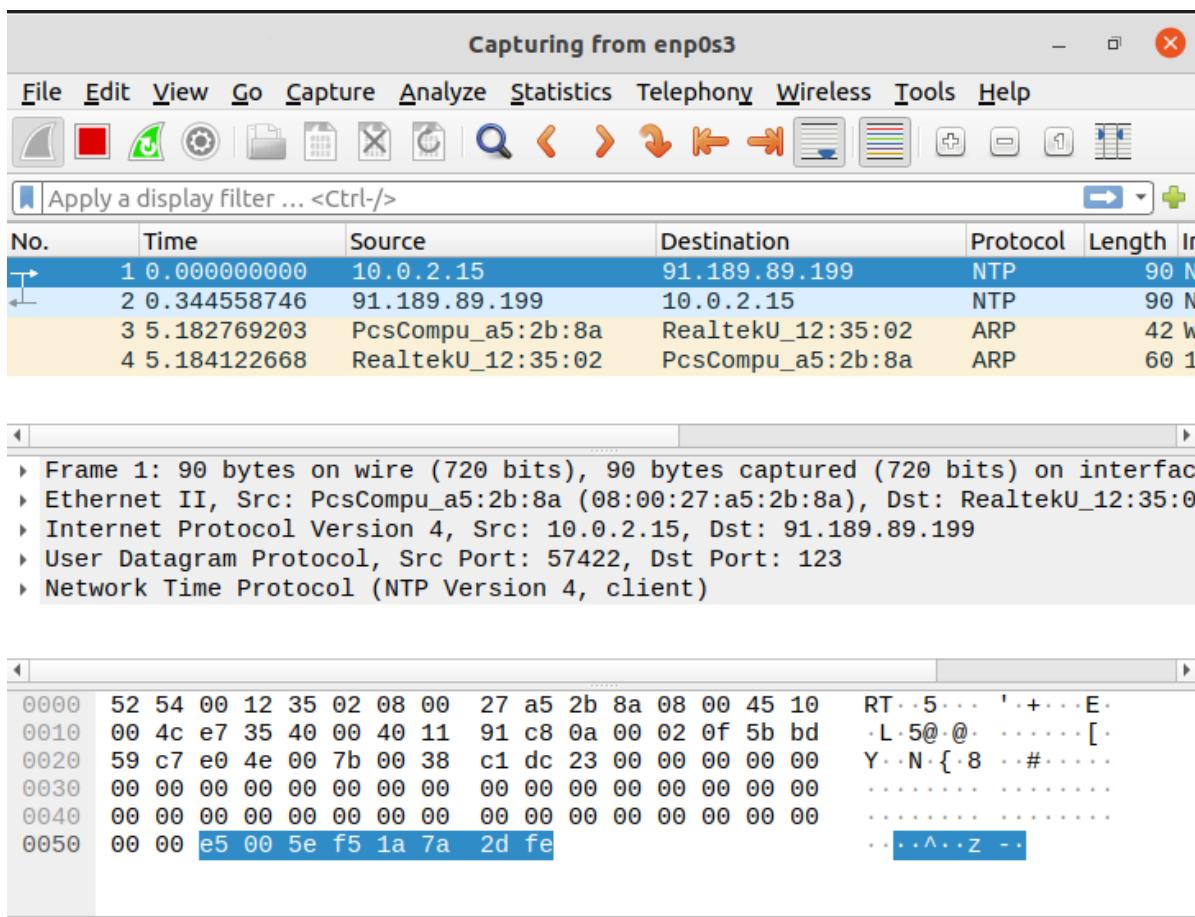
```
Unpacking wireshark (3.2.3-1) ...
Setting up libssh-gcrypt-4:amd64 (0.9.3-2ubuntu2.2) ...
Setting up libdouble-conversion3:amd64 (3.1.5-4ubuntu1) ...
Setting up libxcb-xinput0:amd64 (1.14-2) ...
Setting up libc-ares2:amd64 (1.15.0-1ubuntu0.1) ...
Setting up libwsutil111:amd64 (3.2.3-1) ...
Setting up libpcre2-16-0:amd64 (10.34-7) ...
Setting up libspandsp2:amd64 (0.0.6+dfsg-2) ...
Setting up libsmi2db1:amd64 (0.4.8+dfsg2-16) ...
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 libqt5xshark-data (3.2.3-1) ...
Setting up libqt5dbus5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libwireshark13:amd64 (3.2.3-1) ...
Setting up libqt5network5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up wireshark-common (3.2.3-1) ...
Setting up libqt5gui5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libqt5widgets5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up qt5-gtk-platformtheme:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up libqt5multimedia5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5printsupport5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up wireshark-qt (3.2.3-1) ...
Setting up libqt5opengl5:amd64 (5.12.8+dfsg-0ubuntu1) ...
Setting up wireshark (3.2.3-1) ...
Setting up libqt5svg5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5multimediamediawidgets5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5multimediasupports5:amd64 (5.12.8-0ubuntu1) ...
Setting up libqt5multimedia5-plugins: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) ...
lenovo@lenovo-Lenovo-G50-80:~$ 
```

sudo dpkg-reconfigure wireshark-common

- sudo adduser \$USER wireshark

```
Processing triggers for shared-mime-info (1.15-1) ...
Processing triggers for desktop-file-utils (0.24-1ubuntu3) ...
lenovo@lenovo-Lenovo-G50-80:~$ sudo adduser $USER wireshark
Adding user 'lenovo' to group 'wireshark' ...
Adding user lenovo to group wireshark
Done.
lenovo@lenovo-Lenovo-G50-80:~$ 
```





## Analyzing Data Packets on Wire sha

\*enp0s3

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

http

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

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\_12:35:2f (00:0c:29:12:35:2f)  
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, Len: 141  
Hypertext Transfer Protocol

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 f0 a8 1a 00 00 47 45 54 20 2f 20 48 54 54 50 .....GE T / HTTP

\*enp0s3

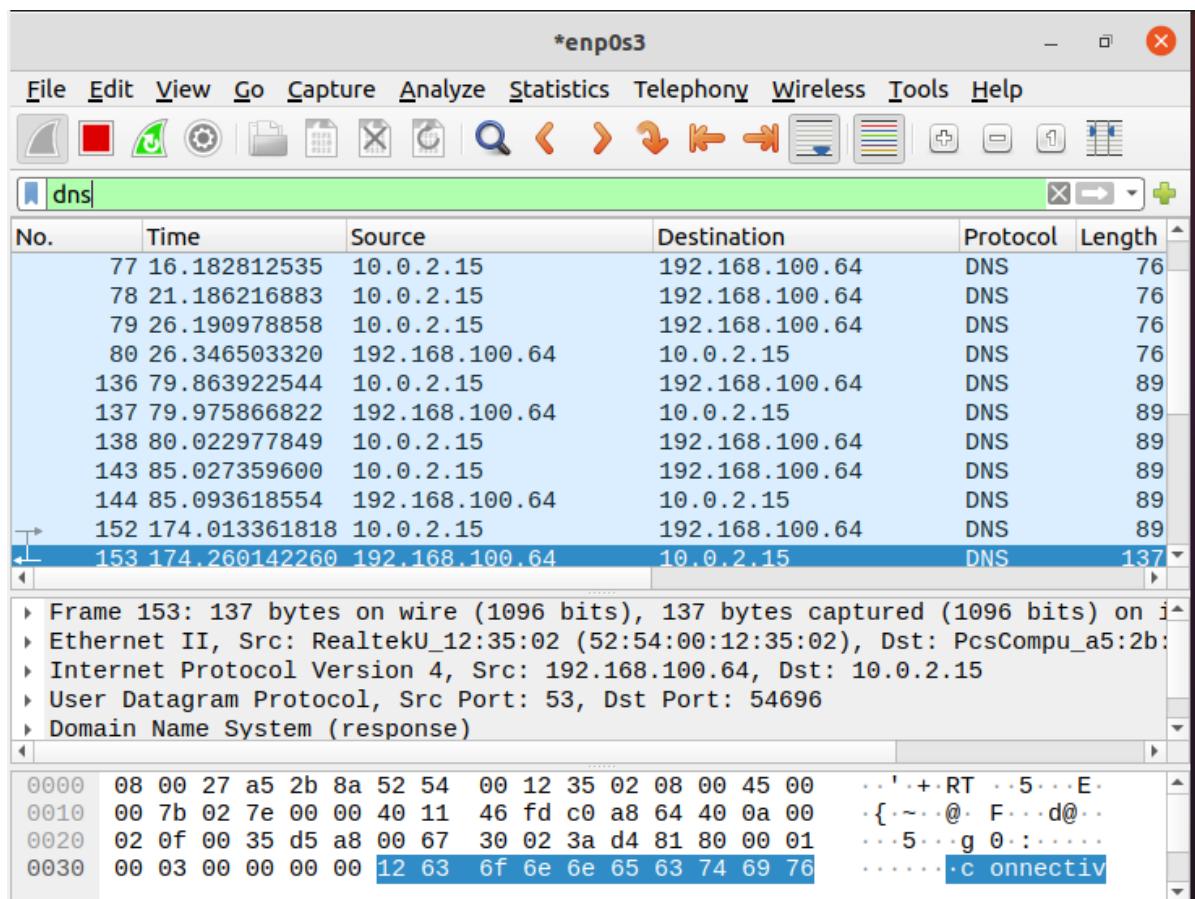
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

tcp

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	29.722139302	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\_12:35:2f (00:0c:29:12:35:2f)  
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: 1600, Len: 85  
Transport Layer Security

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@.8?....[.  
0020 5c 26 b5 c8 01 bb ae ee b1 a0 00 e8 86 70 50 18 \&.....pP.  
0030 f6 2c c4 2b 00 00 15 03 03 00 1a 00 00 00 00 00 .,+.....



## SHELL SCRIPT

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

```
echo "Enter your name:"  
read Name  
echo "Enter your college name:"  
read college  
clear  
echo "Details you entered"  
echo Name: $Name  
echo Program Name: $college
```

```
"Details you entered"  
Name: Ameena sherin  
Program Name: amaljyothy college  
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog2.txt  
lenovo@lenovo-Lenovo-G50-80:~$ ./prog2.txt  
12
```

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

```
echo "Enter 4 integers with space between"  
read a b c d  
sum=`expr $a + $b + $c + $d`  
sub=`expr $a - $b - $c - $d`  
avg=`expr $sum / 4`  
dec=`expr $sum % 4`  
dec=`expr \$ ( $dec \* 1000 \) / 4`  
Product=`expr $a \* $b \* $c \* $d`  
echo Sum = $sum  
echo sub = $sub  
echo Average = $avg. $dec  
echo Product = $product
```

```
lenovo@lenovo-Lenovo-G50-80:~$ nano prog3.txt  
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog3.txt  
lenovo@lenovo-Lenovo-G50-80:~$ ./prog3.txt  
a + b : 30  
a - b : -10  
a * b : 200  
b / a : 2  
b % a : 0  
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
hima@ubuntu:/SAMPLE/TRIALS$ nano shell7.txt
hima@ubuntu:/SAMPLE/TRIALS$ ./shell7.txt
Enter a number
6
./shell7.txt: line 8: ..: syntax error: operand expected (error token is ".")
6 is not found
hima@ubuntu:/SAMPLE/TRIALS$
```

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

```
GNU nano 4.8
echo "Today is $(date)"
echo ""

echo "Calendar :"
cal

lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog5.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog5.txt
Today is Saturday 02 October 2021 06:52:13 PM IST

Calendar :
    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
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog6.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog6.txt
Enter a number:4
RESULT: 4 is even
lenovo@lenovo-Lenovo-G50-80:~$
```

```
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog6.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog6.txt
Enter a number:4
RESULT: 4 is even
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
#!/bin/sh

a=10
b=20

if [ $a -eq $b ]
then
    echo "$a -eq $b : a is equal to b"
else
    echo "$a -eq $b: a is not equal to b"
fi

if [ $a -gt $b ]
then
    echo "$a -gt $b: a is greater than b"
else
    echo "$a -gt $b: a is not greater than b"
fi

if [ $a -lt $b ]
then
    echo "$a -lt $b: a is less than b"
else
    echo "$a -lt $b: a is not less than b"
fi
```

```
lenovo@lenovo-Lenovo-G50-80:~$ ll
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog7.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog7.txt
10 -eq 20: a is not equal to b
10 -gt 20: a is not greater than b
10 -lt 20: a is less than b
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
lenovo@lenovo-Lenovo-G50-80:~$ nano
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog7.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog7.txt
10 -eq 20: a is not equal to b
10 -gt 20: a is not greater than b
10 -lt 20: a is less than b
lenovo@lenovo-Lenovo-G50-80:~$ █
lenovo@lenovo-Lenovo-G50-80:~$ ./prog8.txt
Enter Size(N)
10
Enter Numbers
1
2
3
4
5
6
7
8
9
10
55
lenovo@lenovo-Lenovo-G50-80:~$ █
```

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

```
#!/bin/bash
echo "enter four integers"
read a b c d
sum=$(echo "$a + $b + $c + $d" | bc -l)
average=$(echo "$sum / 4" | bc -l)
product=$(echo "$a * $b * $c * $d" | bc -l)
echo "sum = $sum"
echo "Average = $average"
echo "Product = $product"
```

```
lenovo@lenovo-Lenovo-G50-80:~$ nano prog9.txt
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog9.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog9.txt
enter four integers
3 4 5 6
sum = 18
Average = 4.50000000000000000000000000000000
Product = 360
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
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
```

```
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog10.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog10.txt
enter a:
5
enter b :
3
enter c :
6
Smallest of 5 3 6 is 3
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
echo "Enter a number"
read num

fact=1

while [ $num -gt 1 ]
do
    fact=$((fact * num)) #fact = fact * num
    num=$((num - 1))      #num = num - 1
done

echo $fact
```

```
lenovo@lenovo-Lenovo-G50-80:~$ nano prog11.txt
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog11.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog11.txt
Enter a number
4
24
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
echo "Enter the number"
read n
function pal
{
number=$n
reverse=0
while [ $n -gt 0 ]
do
a=`expr $n % 10 `
n=`expr $n / 10 `
reverse=`expr $reverse \* 10 + $a`
done
echo $reverse
if [ $number -eq $reverse ]
then
    echo "Number is palindrome"
else
    echo "Number is not palindrome"
fi
}
r=`pal $n`
echo "$r"
```

```
lenovo@lenovo-Lenovo-G50-80:~$ nano
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog12.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog12.txt
Enter the number
6
6
Number is palindrome
lenovo@lenovo-Lenovo-G50-80:~$ ./prog12.txt
Enter the number
123
321
Number is not palindrome
lenovo@lenovo-Lenovo-G50-80:~$
```

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

```
chmod: cannot access 'shell20.sh': No such file or directory
hima@ubuntu:~/SAMPLE/TRIAL$ chmod u+x shell20.txt
hima@ubuntu:~/SAMPLE/TRIAL$ ./shell20.txt
Enter Size(N)
4
Enter Numbers
1
2
3
4
2.5000000000000000
hima@ubuntu:~/SAMPLE/TRIAL$
```

Activities Terminal Oct 2 14:15 hima@ubuntu: ~/SAMPLE/TRIAL

hima@ubuntu: ~/SAMPLE/TRIAL x hima@ubuntu: ~/SAMPLE/TRIAL x hima@ubuntu: ~/SAMPLE/TRIAL x

GNU nano 5.4 shell script to find average of n numbers

```
echo "Enter Size(N)"
read N
i=1
sum=0
echo "Enter Numbers"
while [ $i -le $N ]
do
    read num      #get number
    sum=$((sum + num))  #sum+=num
    i=$((i + 1))
done
avg=$(echo $sum / $N | bc -l)
echo $avg
```

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

```
3
3
hima@ubuntu:~/SAMPLE/TRIAL$ ./shell21.txt
Enter a number
45
9
hima@ubuntu:~/SAMPLE/TRIAL$
```

Activities Terminal Oct 2 14:32 hima@ubuntu: ~/SAMPLE/TRIAL

hima@ubuntu: ~/SAMPLE/TRIAL x hima@ubuntu: ~/SAMPLE/TRIAL x hima@ubuntu: ~/SAMPLE/TRIAL x

GNU nano 5.4 #sum of all digits - shell script

```
>_
echo "Enter a number"
read num
sum=0
while [ $num -gt 0 ]
do
    mod=`expr $num % 10`  #It will split each digits
    sum=`expr $sum + $mod` #Add each digit to sum
    num=`expr $num / 10`   #divide num by 10.
done
echo $sum
```

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

```
echo -n "Enter the year to find leap year :- "
read year
d=`expr $year % 4`
b=`expr $year % 100`
c=`expr $year % 400`
if [ $d -eq 0 -a $b -ne 0 -o $c -eq 0 ]
then
echo "year is leap year"
else
echo "not leap year"
fi
```

```
lenovo@lenovo-Lenovo-G50-80:~$ nano prog3.txt
lenovo@lenovo-Lenovo-G50-80:~$ chmod u+x prog3.txt
lenovo@lenovo-Lenovo-G50-80:~$ ./prog3.txt
a + b : 30
a - b : -10
a * b : 200
b / a : 2
b % a : 0
lenovo@lenovo-Lenovo-G50-80:~$
```