

EXPERIMENT NO : 2.1

AIM : LINUX COMMANDS

The Linux commands is a utility of the Linux operating system. All basic and advanced tasks can be done by executing commands in the command line interface, which is the Linux terminal.

open terminal: CTRL+ALT+T

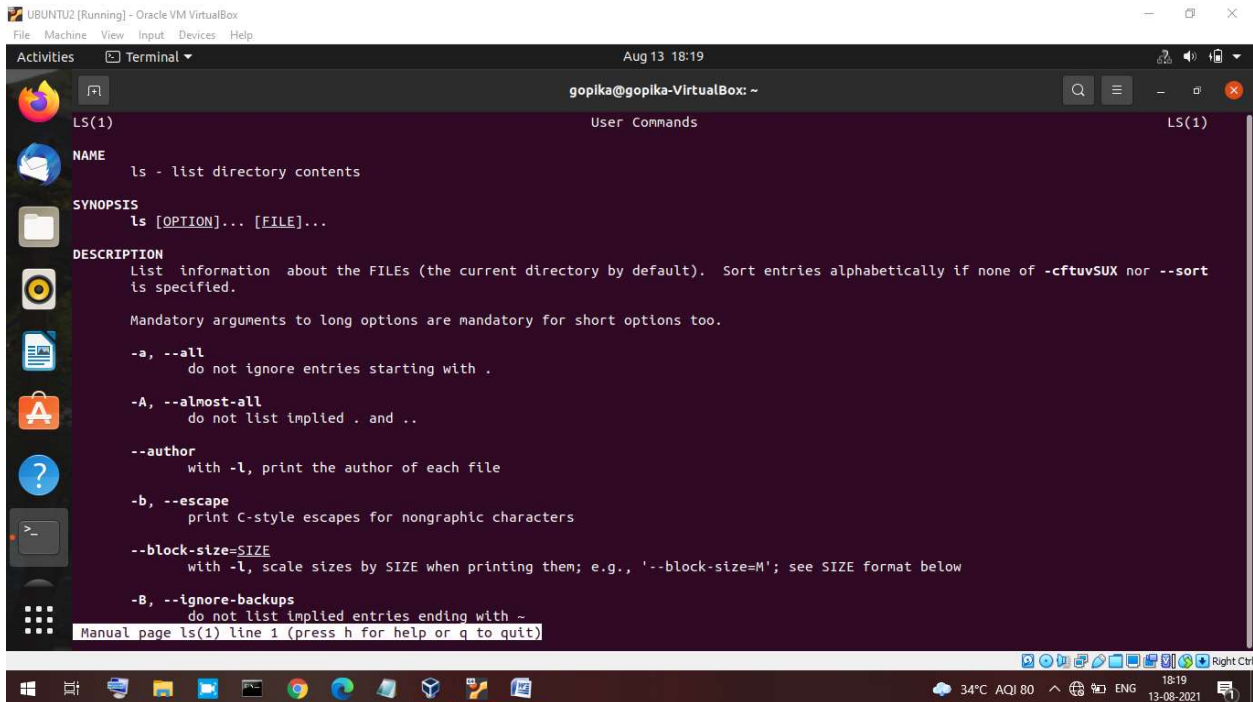
1. man

man command in Linux is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command which includes NAME, SYNOPSIS, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUES, ERRORS, FILES, VERSIONS, EXAMPLES, AUTHORS and SEE ALSO.

Every manual is divided into the following sections:

- Executable programs or shell commands
- System calls (functions provided by the kernel)
- Library calls (functions within program libraries)
- Games
- Special files (usually found in /dev)
- File formats and conventions eg /etc/passwd
- Miscellaneous (including macro packages and conventions), e.g. groff(7)
- System administration commands (usually only for root)
- Kernel routines [Non standard]

```
gopika@gopika-VirtualBox:~$ man ls
gopika@gopika-VirtualBox:~$
```



2.cd ,mkdir,pwd,find,rmdir

- **pwd** –to know the present working directory

```
gopika@gopika-VirtualBox: ~/Desktop
gopika@gopika-VirtualBox:~/Desktop$ pwd
/home/gopika/Desktop
gopika@gopika-VirtualBox:~/Desktop$
```

- **mkdir** –to create a new directory

```
gopika@gopika-VirtualBox: ~/Desktop
gopika@gopika-VirtualBox:~/Desktop$ mkdir file1
gopika@gopika-VirtualBox:~/Desktop$ ls
file1
gopika@gopika-VirtualBox:~/Desktop$
```

- **rmdir** –used to delete a directory

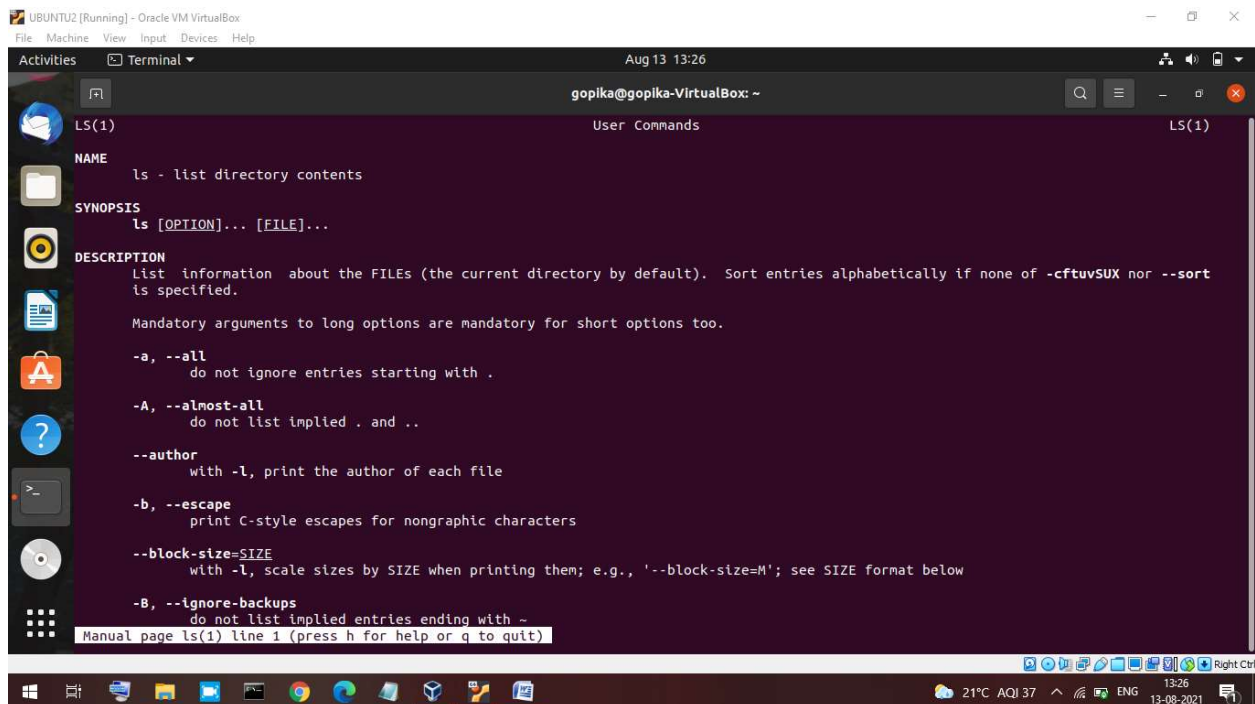
```
gopika@gopika-VirtualBox:~/Desktop$ mkdir file1
gopika@gopika-VirtualBox:~/Desktop$ ls
file1
gopika@gopika-VirtualBox:~/Desktop$ rmdir file1
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika@gopika-VirtualBox:~/Desktop$
```

- **find**- find command can be used in a variety of conditions like you can find files by permissions, users, groups, file types, date, size, and other possible criteria.
- **cd** –used to change the current working directory

```
gopika@gopika-VirtualBox:~$ pwd
/home/gopika
gopika@gopika-VirtualBox:~$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
gopika@gopika-VirtualBox:~$ cd Desktop
gopika@gopika-VirtualBox:~/Desktop$
```

3.ls ,echo ,read

- **ls** – used to display the list of contents in a directory



```
gopika@gopika-VirtualBox:~/Desktop$ cd ..
gopika@gopika-VirtualBox:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
gopika@gopika-VirtualBox:~$
```

- **echo** - echo command in linux is used to display line of text/string that are passed as an argument .
- **read** - read command in Linux system is used to read from a file descriptor

```
gopika@gopika-VirtualBox:~$ echo "what is your name?";read name; echo welcome $name!
what is your name?
Gopika
welcome Gopika!
gopika@gopika-VirtualBox:~$
```

4.touch ,cat, more ,less

- **touch** –used to create empty file ,it can also be used to create multiple empty files in a directory

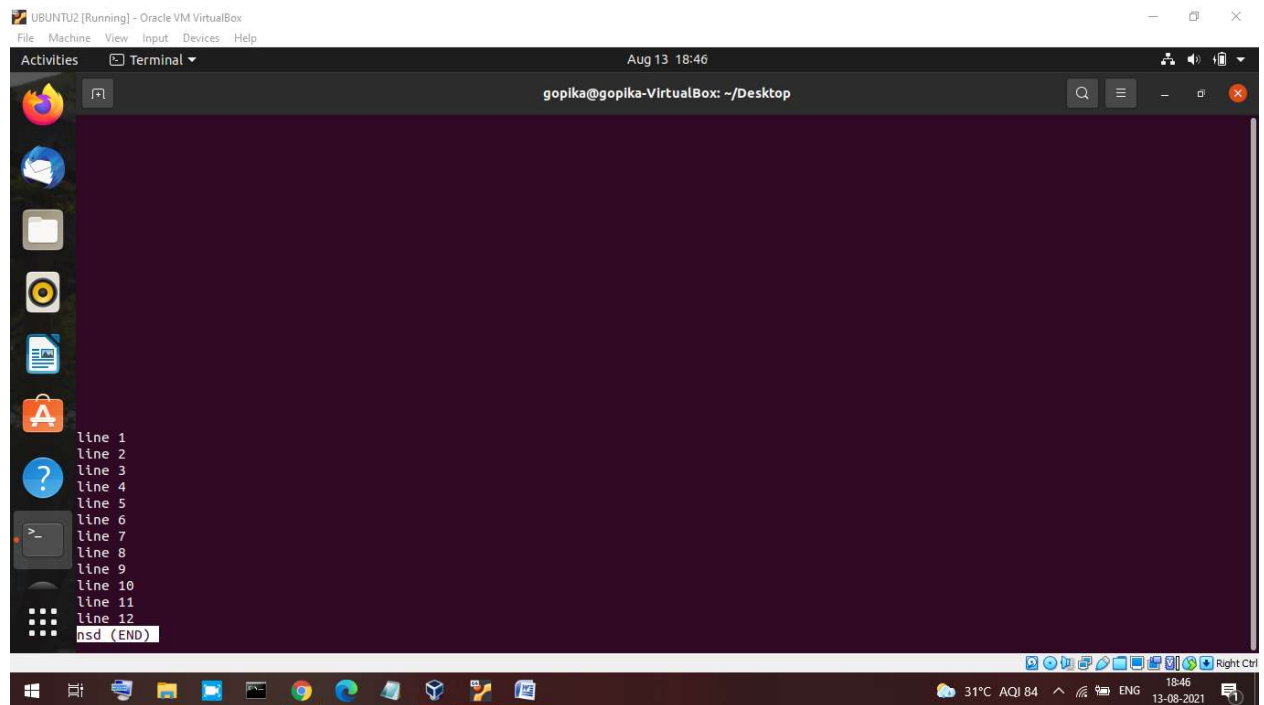
```
gopika@gopika-VirtualBox:~/Desktop$ touch file1
gopika@gopika-VirtualBox:~/Desktop$ ls
file1
gopika@gopika-VirtualBox:~/Desktop$ touch file2 file3
gopika@gopika-VirtualBox:~/Desktop$ ls
file1  file2  file3
gopika@gopika-VirtualBox:~/Desktop$
```

- **cat** – it is a multipurpose utility command which can be used for create a new file, display contents in a file ,copy the content of one file to another etc.

The screenshot shows a terminal window titled 'gopika@gopika-VirtualBox: ~/Desktop'. The user has performed several commands:
1. `cat >nsd`: Created a file named 'nsd'.
2. `ls`: Listed the files, showing 'new' and 'nsd'.
3. `vim nsd`: Opened the 'nsd' file in the vim editor.
4. `cat nsd`: Displayed the contents of 'nsd', which are:
line 1
line 2
line 3
line 4
hey
hello
hi
5. `vim new`: Opened a file named 'new' in the vim editor.
6. `cat new`: Displayed the contents of 'new', which are:
hey i am gopika
7. `cat new nsd`: Displayed the contents of both files concatenated:
hey i am gopika
line 1
line 2
line 3
line 4
hey
hello
hi
8. `cat new`: Displayed the contents of 'new' again:
hey i am gopika
9. `cat nsd`: Displayed the contents of 'nsd' again:
line 1
line 2
line 3
line 4
hey
hello
hi

- **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).
- **less**-Less command is a Linux utility that can be used to read the contents of a text file one page(one screen) at a time

The screenshot shows a terminal window with the following commands and output:
1. `more nsd`: Displays the contents of 'nsd' line by line, from 'line 1' to 'line 12'.
2. `less nsd`: Opens the 'nsd' file in the less command-line pager.
3. `less nsd`: Repeats the command, showing the same output.

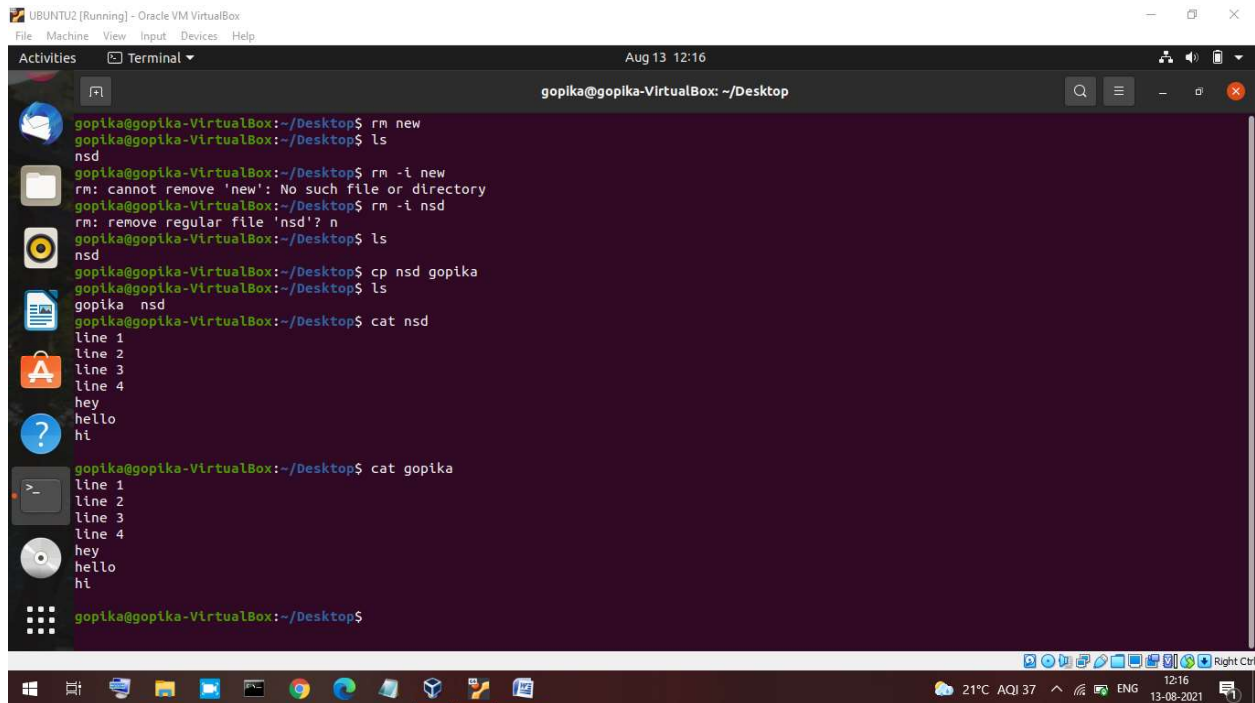


5. rm,cp,mv,tar

- **rm** –used to remove a file

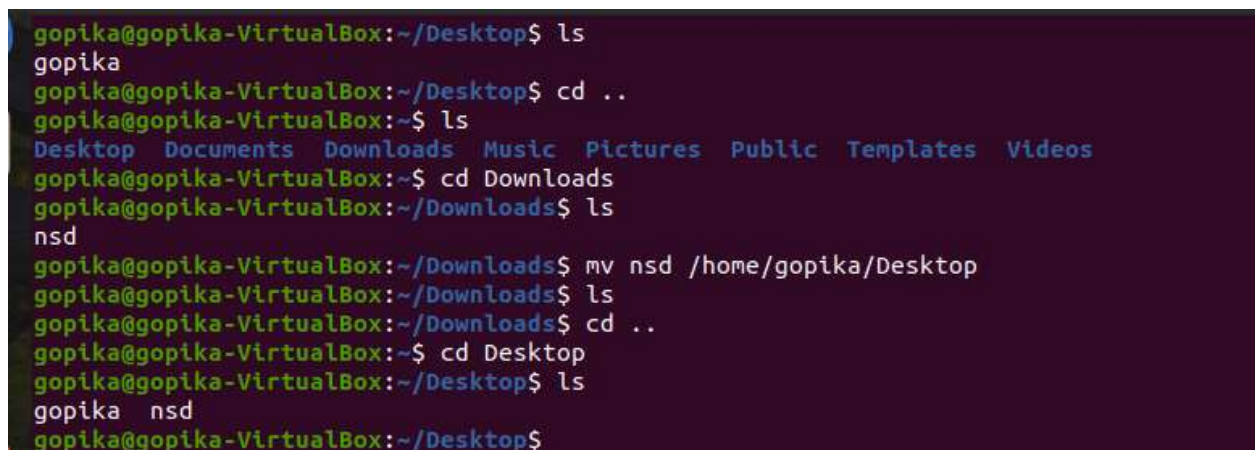
```
gopika@gopika-VirtualBox:~/Desktop$ rm new
gopika@gopika-VirtualBox:~/Desktop$ ls
nsd
gopika@gopika-VirtualBox:~/Desktop$ rm -i new
rm: cannot remove 'new': No such file or directory
gopika@gopika-VirtualBox:~/Desktop$ rm -i nsd
rm: remove regular file 'nsd'? n
gopika@gopika-VirtualBox:~/Desktop$ ls
nsd
gopika@gopika-VirtualBox:~/Desktop$
```

- **cp** –used to copy a file or directory



```
gopika@gopika-VirtualBox: ~/Desktop
gopika@gopika-VirtualBox:~/Desktop$ rm new
gopika@gopika-VirtualBox:~/Desktop$ ls
nsd
gopika@gopika-VirtualBox:~/Desktop$ rm -i new
rm: cannot remove 'new': No such file or directory
gopika@gopika-VirtualBox:~/Desktop$ rm -i nsd
rm: remove regular file 'nsd'? n
gopika@gopika-VirtualBox:~/Desktop$ ls
nsd
gopika@gopika-VirtualBox:~/Desktop$ cp nsd gopika
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika  nsd
gopika@gopika-VirtualBox:~/Desktop$ cat nsd
line 1
line 2
line 3
line 4
hey
hello
hi
gopika@gopika-VirtualBox:~/Desktop$ cat gopika
line 1
line 2
line 3
line 4
hey
hello
hi
gopika@gopika-VirtualBox:~/Desktop$
```

- **mv** –used to move a file or a directory from one location to another



```
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika
gopika@gopika-VirtualBox:~/Desktop$ cd ..
gopika@gopika-VirtualBox:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos
gopika@gopika-VirtualBox:~$ cd Downloads
gopika@gopika-VirtualBox:~/Downloads$ ls
nsd
gopika@gopika-VirtualBox:~/Downloads$ mv nsd /home/gopika/Desktop
gopika@gopika-VirtualBox:~/Downloads$ ls
gopika@gopika-VirtualBox:~/Downloads$ cd ..
gopika@gopika-VirtualBox:~$ cd Desktop
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika  nsd
gopika@gopika-VirtualBox:~/Desktop$
```

- **rename**- used to rename files

rename <file name>

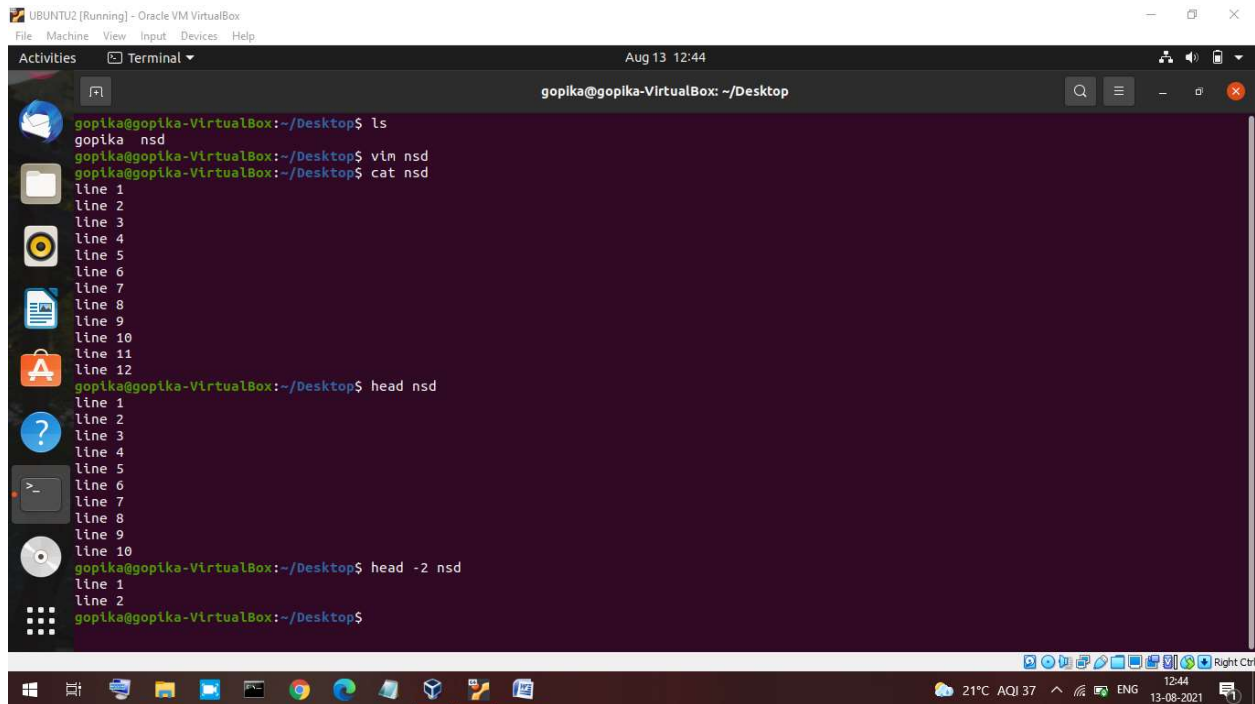
- **tar** – used to create compressed archieve files and that can be moved from one disk to another

syntax:- tar {A|c|d|r|t|u|x}[GnSkUWOmpsMBiajJzZhPlRvwo] [ARG...]

6. head, tail, tac , grep

head – used to display the content of a file. By default it display the first 10 lines of the file , if we needed to display particular number of lines use

`head -<no.of lines> <filename>`



The screenshot shows a terminal window titled "gopika@gopika-VirtualBox: ~/Desktop". The terminal output is as follows:

```
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika nsd
gopika@gopika-VirtualBox:~/Desktop$ vim nsd
gopika@gopika-VirtualBox:~/Desktop$ cat nsd
line 1
line 2
line 3
line 4
line 5
line 6
line 7
line 8
line 9
line 10
line 11
line 12
gopika@gopika-VirtualBox:~/Desktop$ head nsd
line 1
line 2
line 3
line 4
line 5
line 6
line 7
line 8
line 9
line 10
gopika@gopika-VirtualBox:~/Desktop$ head -2 nsd
line 1
line 2
gopika@gopika-VirtualBox:~/Desktop$
```

tail – used to display the last ten lines by default. To display specific number of lines

`tail -<no of lines> <file name>`

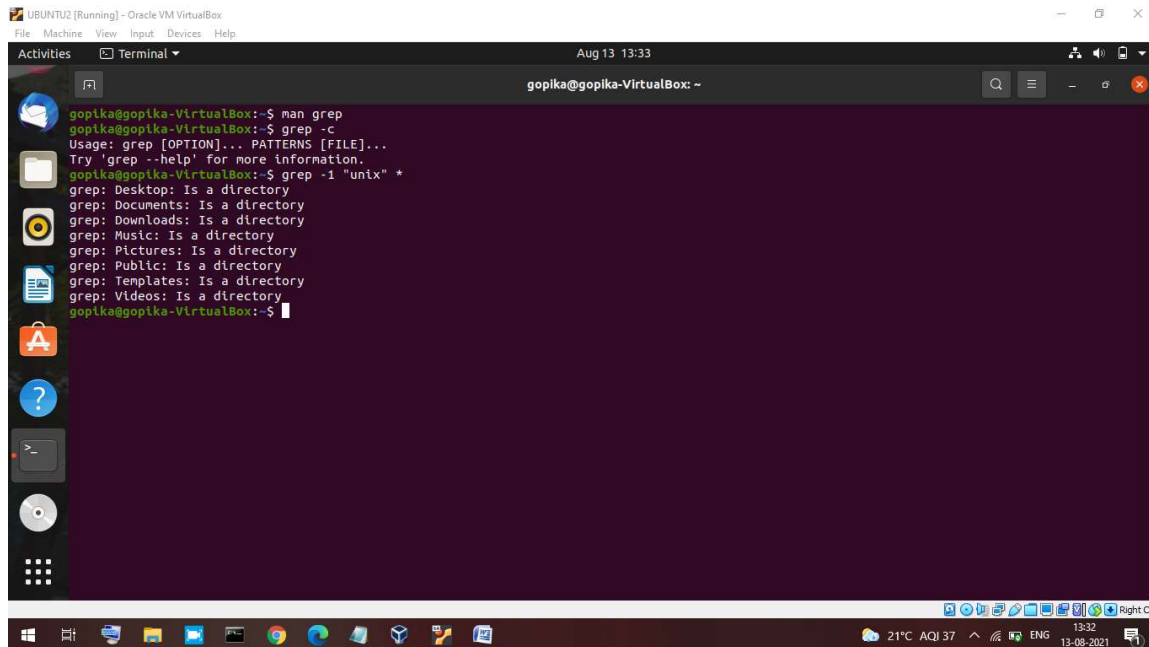

```
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika  nsd
gopika@gopika-VirtualBox:~/Desktop$ tail nsd
line 3
line 4
line 5
line 6
line 7
line 8
line 9
line 10
line 11
line 12
gopika@gopika-VirtualBox:~/Desktop$ tail -4 nsd
line 9
line 10
line 11
line 12
gopika@gopika-VirtualBox:~/Desktop$
```

tac – reverse of cat command. It is used to display the file content in reverse order.

```
gopika@gopika-VirtualBox:~/Desktop$ ls
gopika  nsd
gopika@gopika-VirtualBox:~/Desktop$ tac nsd
line 12
line 11
line 10
line 9
line 8
line 7
line 6
line 5
line 4
line 3
line 2
line 1
```

grep - grep searches for PATTERNS in each FILE. PATTERNS is one or more patterns separated by newline characters, and grep prints each line that matches a pattern. Typically PATTERNS should be quoted when grep is used in a shell command.

Syntax:- grep [OPTION...] PATTERNS [FILE...]



```
gopika@gopika-VirtualBox:~$ man grep
gopika@gopika-VirtualBox:~$ grep -c
Usage: grep [OPTION]... PATTERNS [FILE]...
Try 'grep --help' for more information.
gopika@gopika-VirtualBox:~$ grep -l "unix" *
grep: Desktop: Is a directory
grep: Documents: Is a directory
grep: Downloads: Is a directory
grep: Music: Is a directory
grep: Pictures: Is a directory
grep: Public: Is a directory
grep: Templates: Is a directory
grep: Videos: Is a directory
gopika@gopika-VirtualBox:~$
```

7. whatis , whereis

whereis – used to find the location of source/binary file of a command and manuals sections for a specified file.

```
gopika@gopika-VirtualBox:~/Desktop$ cd ..
gopika@gopika-VirtualBox:~$ whereis print
print: /usr/bin/print /usr/share/man/man1/print.1.gz
gopika@gopika-VirtualBox:~$
```

whatis – used to get a one line manual page descriptions.

```
gopika@gopika-VirtualBox:~$ whatis print
print (1) - execute programs via entries in the mailcap file
gopika@gopika-VirtualBox:~$
```

8.wc,cut ,paste

wc- The wc (word count) command in Unix/Linux operating systems is used to find out number of newline count, word count, byte and characters count in a files specified by the file arguments.

```
gopika@gopika-VirtualBox:~/Desktop$ wc -w nsd
24 nsd
gopika@gopika-VirtualBox:~/Desktop$
```

Cut- cut command is useful for selecting a specific column of a file. It is used to cut a specific sections by byte position, character, and field and writes them to standard output. It cuts a line and extracts the text data.

Paste - cut is a command-line utility that allows you to cut parts of lines from specified files or piped data and print the result to standard output.

9.chmod ,chown

chmod - The chmod command allows to change the permissions on a file using either a symbolic or numeric mode or a reference file.

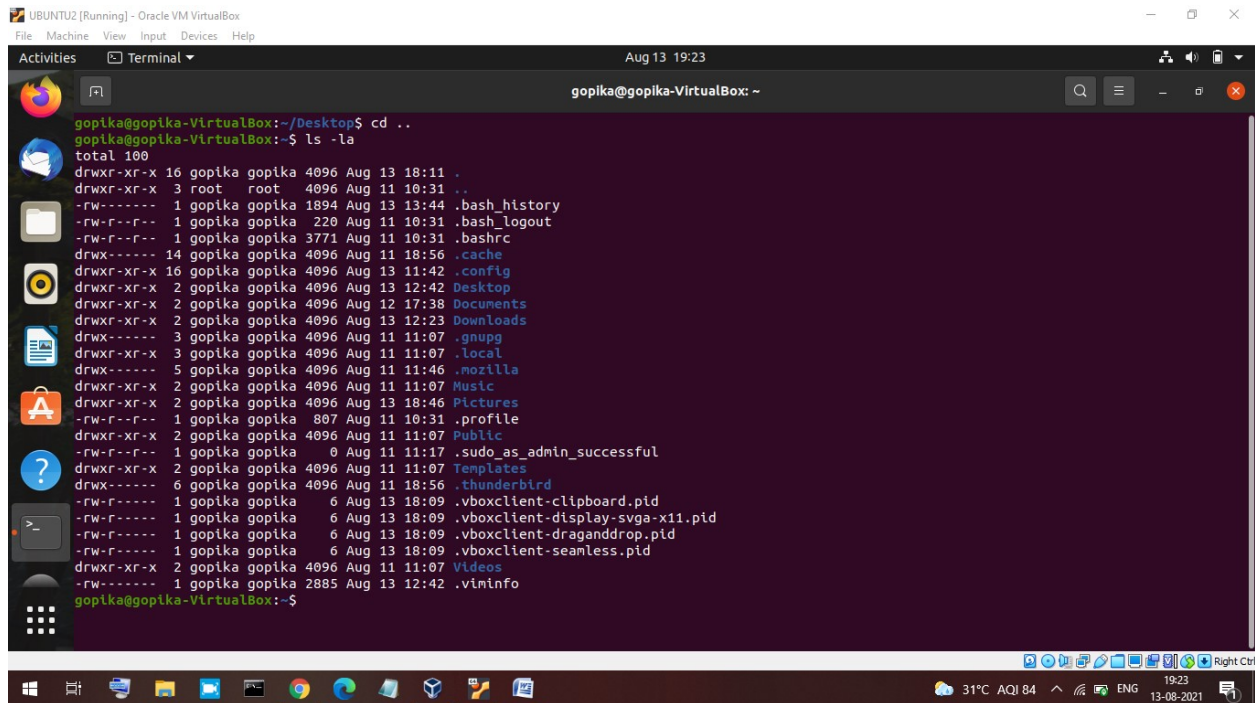
chown - Linux chown command is used to change a file's ownership, directory, or symbolic link for a user or group.

10. redirections and piping

Redirection is a feature in Linux such that when executing a command, you can change the standard input/output devices. The basic workflow of any Linux command is that it takes an input and give an output.

- The standard input (stdin) device is the keyboard.
- The standard output (stdout) device is the screen.

Piping-The Pipe is a command in Linux that lets you use two or more commands such that output of one command serves as input to the next. In short, the output of each process directly as input to the next one like a pipeline. The symbol '|' denotes a pipe.



```
gopika@gopika-VirtualBox:~/Desktop$ cd ..
gopika@gopika-VirtualBox:~$ ls -la
total 100
drwxr-xr-x 16 gopika gopika 4096 Aug 13 18:11 .
drwxr-xr-x  3 root  root   4096 Aug 11 10:31 ..
-rw-r----- 1 gopika gopika 1894 Aug 13 13:44 .bash_history
-rw-r--r--  1 gopika gopika  220 Aug 11 10:31 .bash_logout
-rw-r--r--  1 gopika gopika 3771 Aug 11 10:31 .bashrc
drwx----- 14 gopika gopika 4096 Aug 11 18:56 .cache
drwxr-xr-x 16 gopika gopika 4096 Aug 13 11:42 .config
drwxr-xr-x  2 gopika gopika 4096 Aug 13 12:42 Desktop
drwxr-xr-x  2 gopika gopika 4096 Aug 12 17:38 Documents
drwxr-xr-x  2 gopika gopika 4096 Aug 13 12:23 Downloads
drwx-----  3 gopika gopika 4096 Aug 11 11:07 .gnupg
drwxr-xr-x  3 gopika gopika 4096 Aug 11 11:07 .local
drwx-----  5 gopika gopika 4096 Aug 11 11:46 .mozilla
drwxr-xr-x  2 gopika gopika 4096 Aug 11 11:07 Music
drwxr-xr-x  2 gopika gopika 4096 Aug 13 18:46 Pictures
-rw-r--r--  1 gopika gopika  807 Aug 11 10:31 .profile
drwxr-xr-x  2 gopika gopika 4096 Aug 11 11:07 Public
-rw-r--r--  1 gopika gopika    0 Aug 11 11:17 .sudo_as_admin_successful
drwxr-xr-x  2 gopika gopika 4096 Aug 11 11:07 Templates
drwx-----  6 gopika gopika 4096 Aug 11 18:56 .thunderbird
-rw-r-----  1 gopika gopika    6 Aug 13 18:09 .vboxclient-clipboard.pid
-rw-r-----  1 gopika gopika    6 Aug 13 18:09 .vboxclient-display-svga-x11.pid
-rw-r-----  1 gopika gopika    6 Aug 13 18:09 .vboxclient-draganddrop.pid
-rw-r-----  1 gopika gopika    6 Aug 13 18:09 .vboxclient-seamless.pid
drwxr-xr-x  2 gopika gopika 4096 Aug 11 11:07 VIDEOS
-rw-r-----  1 gopika gopika 2885 Aug 13 12:42 .viminfo
gopika@gopika-VirtualBox:~$
```

11.useradd ,usermod ,userdel ,passwd

- **useradd** command is used to create new accounts in Linux
- **usermod** command used to modify the existing accounts in linux
- **userdel** command is used to delete local account in linux
- **passwd** command used assign password to local accounts or users.

12. df,top ,ps

Df - This utility reports the free disk space(Hard Disk) on all the file systems.

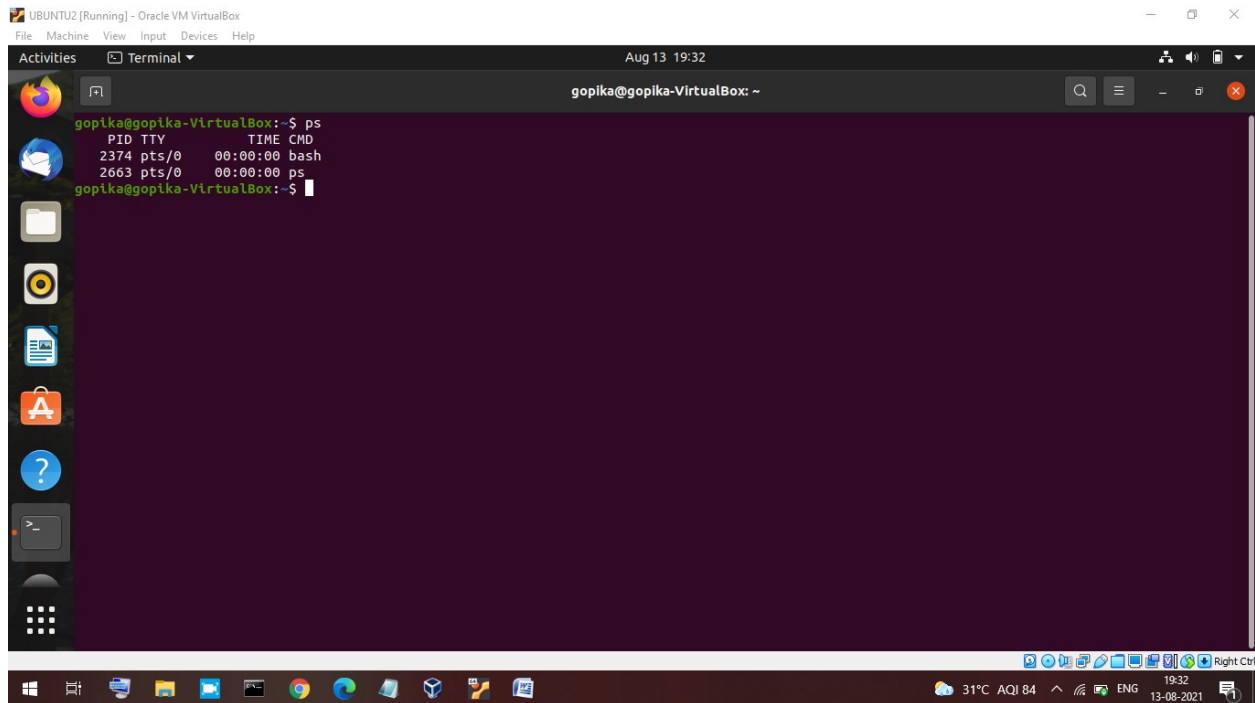
```
UBUNTU2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Aug 13 19:30
gopika@gopika-VirtualBox: ~
gopika@gopika-VirtualBox:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev             537368         0   537368  0% /dev
tmpfs            113288        1328   111960  2% /run
/dev/sda5        9736500    8815984   406212  96% /
tmpfs            566424         0   566424  0% /dev/shm
tmpfs             5120          4     5116  1% /run/lock
tmpfs            566424         0   566424  0% /sys/fs/cgroup
/dev/loop1       224256    224256     0 100% /snap/gnome-3-34-1804/66
/dev/loop0       56832     56832     0 100% /snap/core18/1988
/dev/loop2       56832     56832     0 100% /snap/core18/2128
/dev/loop3       224256    224256     0 100% /snap/gnome-3-34-1804/72
/dev/loop5       66688     66688     0 100% /snap/gtk-common-themes/1515
/dev/loop6       52352     52352     0 100% /snap/snap-store/518
/dev/loop7       31872     31872     0 100% /snap/snapd/11036
/dev/loop4       66432     66432     0 100% /snap/gtk-common-themes/1514
/dev/loop9       33152     33152     0 100% /snap/snapd/12704
/dev/loop8       52224     52224     0 100% /snap/snap-store/547
/dev/sda1        523248         4   523244  1% /boot/efi
New_folder      439742588 70124156 369618432 16% /media/sf_New_folder
VM              439742588 70124156 369618432 16% /media/sf_VM
tmpfs            113284         20   113264  1% /run/user/1000
/dev/sr0         59642         0   59642  0% /media/gopika/VBox_GAs_6.1.26
gopika@gopika-VirtualBox:~$
```

top Details on all Active Processes

```
UBUNTU2 [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Aug 13 19:31
gopika@gopika-VirtualBox: ~
top - 19:31:32 up 1:25, 1 user, load average: 0.31, 0.11, 0.04
Tasks: 191 total, 1 running, 189 sleeping, 0 stopped, 1 zombie
%cpu(s): 3.3 us, 2.0 sy, 0.0 ni, 94.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
Mem Mem : 1106.3 total, 73.0 free, 705.6 used, 327.7 buff/cache
Mem Swap: 448.5 total, 212.3 free, 236.2 used, 259.2 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR  S  %CPU  %MEM    TIME+  COMMAND
 2364 gopika    20   0   823240   50076  37552 S   1.6   4.4   0:09.95 gnome-terminal-
2659 gopika    20   0   20488    3900   3256 R   1.6   0.3   0:00.26 top
1478 gopika    20   0   267864   33004  12920 S   1.0   2.9   0:14.07 Xorg
1715 gopika    20   0   3606464  197260  67472 S   0.6  17.4   0:49.73 gnome-shell
 235 root       20   0         0         0      0 I   0.3   0.0   0:07.97 kworker/0:3-events
 796 mysql     20   0   1301584  190584  3704 S   0.3  16.8   0:25.82 mysqld
1645 gopika    20   0   163996   2424   2188 S   0.3   0.2   0:21.33 VBoxClient
   1 root       20   0   315344   9252   6720 S   0.0   0.8   0:05.56 systemd
    2 root       20   0         0         0      0 S   0.0   0.0   0:00.00 kthreadd
    3 root       0 -20         0         0      0 I   0.0   0.0   0:00.00 rcu_gp
    4 root       0 -20         0         0      0 I   0.0   0.0   0:00.00 rcu_par_gp
    6 root       0 -20         0         0      0 I   0.0   0.0   0:00.00 kworker/0:0H-events_highpri
    7 root       20   0         0         0      0 I   0.0   0.0   0:00.02 kworker/0:1-events
    9 root       0 -20         0         0      0 I   0.0   0.0   0:00.00 mm_percpu_wq
   10 root       20   0         0         0      0 S   0.0   0.0   0:00.00 rcu_tasks_rude_
   11 root       20   0         0         0      0 S   0.0   0.0   0:00.00 rcu_tasks_trace
   12 root       20   0         0         0      0 S   0.0   0.0   0:00.39 ksoftirqd/0
   13 root       20   0         0         0      0 I   0.0   0.0   0:02.08 rcu_sched
   14 root       rt    0         0         0      0 S   0.0   0.0   0:00.07 migration/0
   15 root      -51   0         0         0      0 S   0.0   0.0   0:00.00 idle_inject/0
   16 root       20   0         0         0      0 S   0.0   0.0   0:00.00 cpuhp/0
   17 root       20   0         0         0      0 S   0.0   0.0   0:00.00 kdevtmpfs
   18 root       0 -20         0         0      0 I   0.0   0.0   0:00.00 netns
   19 root       0 -20         0         0      0 I   0.0   0.0   0:00.00 inet_frag_wq
   20 root       20   0         0         0      0 S   0.0   0.0   0:00.00 kauditd
```

ps Give the status of processes running for a user



13.ssh ,scp , ssh-keygen , ssh-copy-id

ssh-The ssh command provides a secure encrypted connection between two hosts over an insecure network. This connection can also be used for terminal access, file transfers, and for tunneling other applications.

scp -scp (secure copy) command in Linux system is used to copy file(s) between servers in a secure way. The SCP command or secure copy allows secure transferring of files in between the local host and the remote host or between two remote hosts

Ssh-keygen is a tool for creating new authentication key pairs for SSH. Such key pairs are used for automating logins, single sign-on, and for authenticating hosts.

ssh-copy-id copies the local-host's public key to the remote-host's authorized_keys file. ssh-copy-id also assigns proper permission to the remote-host's home, ~/.ssh, and ~/.ssh/authorized_keys.