Practical-1

Durgesh Dilip Mandge 2023510032

Linux Basic Commands

1> **pwd** : print working directory, it prints directory which we are in

```
durgeshmandge@durgeshmandge-VirtualBox:~$ pwd
/home/durgeshmandge
```

2> **ls** : this command is used to list all files present in current directory

```
durgeshmandge@durgeshmandge-VirtualBox:~$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  snap  Templates  Videos
durgeshmandge@durgeshmandge-VirtualBox:~$ ls -l
total 36
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Desktop
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Documents
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Downloads
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Music
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Pictures
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Public
drwx------ 3 durgeshmandge durgeshmandge 4096 Jan 18 12:45 snap
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Templates
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Videos
```

3> **mkdir** : make directory , command to create new directory
4> **cd** : change directory , command to change directory

```
durgeshmandge@durgeshmandge-VirtualBox:~$ mkdir demoDirectory
durgeshmandge@durgeshmandge-VirtualBox:~$ cd demoDirectory/
```

4> **rmdir** : remove directory , command to remove directory

```
durgeshmandge@durgeshmandge-VirtualBox:~/demoDirectory$ cd ..
durgeshmandge@durgeshmandge-VirtualBox:~$ rmdir demoDirectory/
```

5> **rm -r** : removes directory or file

```
durgeshmandge@durgeshmandge-VirtualBox:~$ mkdir demoDirectory
durgeshmandge@durgeshmandge-VirtualBox:~$ rm -r demoDirectory/
```

6> **touch** : used to create file

```
durgeshmandge@durgeshmandge-VirtualBox:~$ touch demo.txt
```

```
durgeshmandge@durgeshmandge-VirtualBox:~$ ls -l
total 36
-rw-rw-r-- 1 durgeshmandge durgeshmandge    0 Jan 18 12:54 demo.txt
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Desktop
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Documents
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Downloads
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Music
drwxr-xr-x 3 durgeshmandge durgeshmandge 4096 Jan 18 12:57 Pictures
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Public
drwx------ 3 durgeshmandge durgeshmandge 4096 Jan 18 12:45 snap
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Templates
drwxr-xr-x 2 durgeshmandge durgeshmandge 4096 Jan 18 12:45 Videos
```

7> **man** : This command gives the manual

```
durgeshmandge@durgeshmandge-VirtualBox: ~
AN(1)                                Manual pager utils                                MAN(1)

AME
     man - an interface to the system reference manuals

YNOPSIS
     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 ...

ESCRIPTION
     man  is  the  system's manual pager.  Each page argument given to man is normally the name of a program, utility or func-
     tion.  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  sec-
     tions.

     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), man-pages(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, ER-
     RORS, ENVIRONMENT, FILES, VERSIONS, CONFORMING TO, NOTES, BUGS, EXAMPLE, AUTHORS, and SEE ALSO.
```

8> **cp** : This command is used to copy file through command line

```
durgeshmandge@durgeshmandge-VirtualBox:~$ cp demo.txt demo1.txt
```

9> **mv** : This command is used to move data from one file to other

```
durgeshmandge@durgeshmandge-VirtualBox:~$ mv demo.txt demo1.txt
durgeshmandge@durgeshmandge-VirtualBox:~$ ls
demo1.txt  Desktop  Documents  Downloads  Music  Pictures  Public  snap  Templates  Videos
```

10> **locate** : This command is used to get location of provided file

```
durgeshmandge@durgeshmandge-VirtualBox:~$ locate demo1.txt
/home/durgeshmandge/demo1.txt
```

Soft links and Hard links : -

Hard links:

```
durgeshmandge@durgeshmandge-VirtualBox:~$ ln demo1.txt ~/demo.txt
```

```
durgeshmandge@durgeshmandge-VirtualBox:~$ rm ~/demo.txt
```

Symbolic Links:

```
durgeshmandge@durgeshmandge-VirtualBox:~$ ln -s demo1.txt ~/demo.txt
durgeshmandge@durgeshmandge-VirtualBox:~$ ls
demo1.txt  demo.txt  Desktop  Documents  Downloads  Music  Pictures  Public  snap  Templates  Videos
```

Intermediate Commands : -

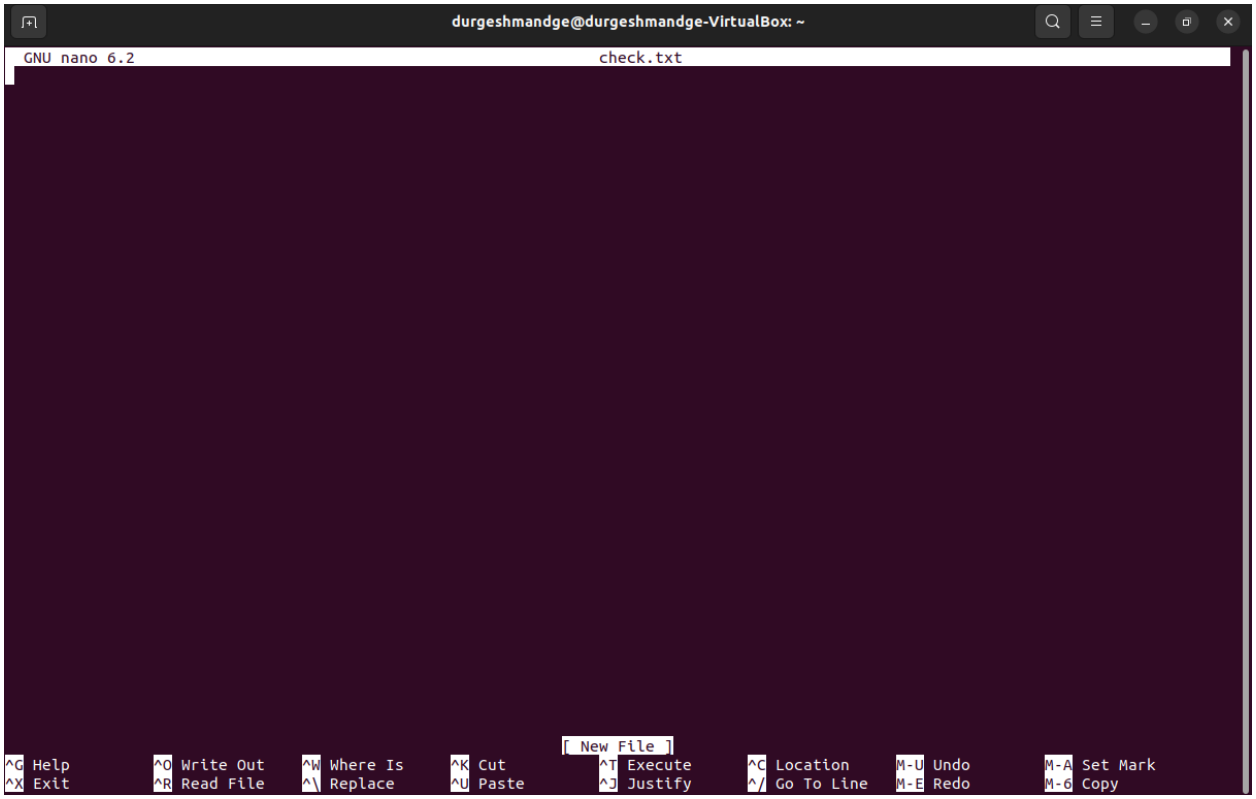
1> **echo** : This command is used to copy data of one file to another. We can create text file or can add into existing one.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ echo demo.txt >> new.txt
```

2> **cat** : command to view content of file, helps to view programs

```
durgeshmandge@durgeshmandge-VirtualBox:~$ cat new.txt
demo.txt
```

3> **nano, vi, jd** : The nano command is a good text editor that denotes keywords with color and can recognize most languages. And vi is simpler than nano. You can create a new file or modify a file using this editor. For example, if you need to make a new file named "check.txt", you can create it by using the command “nano check.txt”.



4> **sudo :** sudo stands for ‘SuperUser do’. if you want any command to be done with administrative or root privileges, you can use the sudo command.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ sudo nano new.txt
[sudo] password for durgeshmandge:
```

5> **df :** The df command to see the available disk space in each of the partitions in your system. We can use -m to check the disk space in mega bytes.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ df -m
Filesystem     1M-blocks  Used Available Use% Mounted on
tmpfs                391     2       390   1% /run
/dev/sda3          24519 13514      9735  59% /
tmpfs                1954     0      1954   0% /dev/shm
tmpfs                   5     1         5   1% /run/lock
/dev/sda2             512     7       506   2% /boot/efi
tmpfs                391     1       391   1% /run/user/1000
durgeshmandge@durgeshmandge-VirtualBox:~$
```

6> **du** : The du command is used to know the disk usage of a file in your system.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ du
4       ./Documents
28      ./snap/snapd-desktop-integration/common/.cache/gio-modules
72      ./snap/snapd-desktop-integration/common/.cache/immodules
108     ./snap/snapd-desktop-integration/common/.cache
112     ./snap/snapd-desktop-integration/common
4       ./snap/snapd-desktop-integration/83/Documents
4       ./snap/snapd-desktop-integration/83/Desktop
4       ./snap/snapd-desktop-integration/83/Music
4       ./snap/snapd-desktop-integration/83/Downloads
4       ./snap/snapd-desktop-integration/83/Pictures
4       ./snap/snapd-desktop-integration/83/Public
4       ./snap/snapd-desktop-integration/83/Templates
4       ./snap/snapd-desktop-integration/83/Videos
4       ./snap/snapd-desktop-integration/83/.local/share/glib-2.0/schemas
8       ./snap/snapd-desktop-integration/83/.local/share/glib-2.0
```

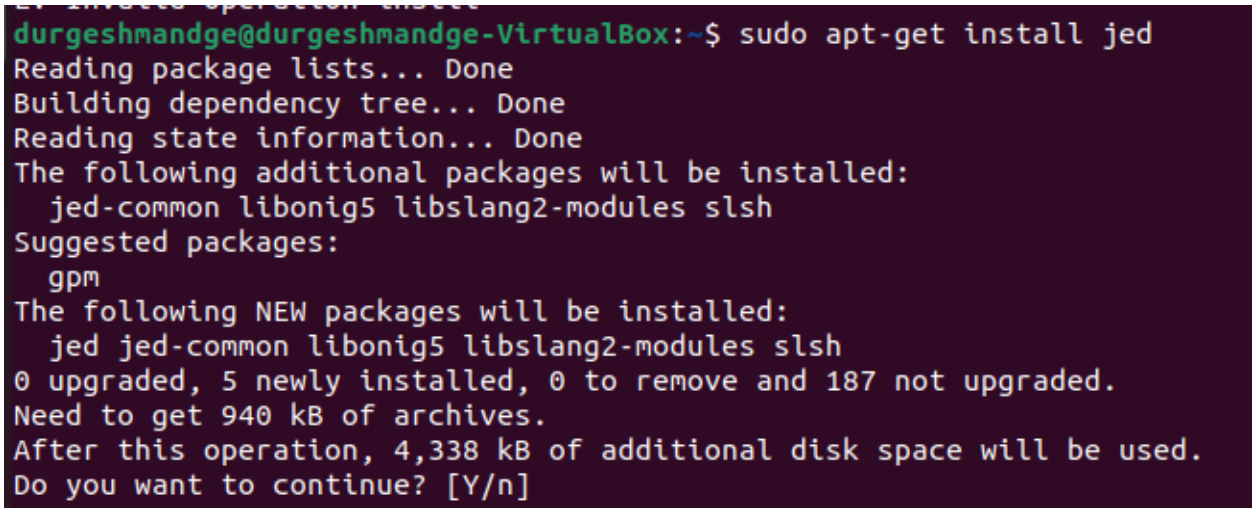
7> **tar** : - Use tar to work with tarballs (or files compressed in a tarball archive) in the Linux command line. It has a long list of uses. It can be used to compress and uncompress different types of tar archives like .tar, .tar.gz, .tar.bz2,etc

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

9> **uname** : This command use to give the system your Linux distro is running.

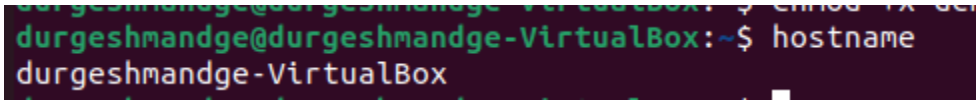
```
durgeshmandge@durgeshmandge-VirtualBox:~$ uname -a
Linux durgeshmandge-VirtualBox 6.5.0-14-generic #14~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Mon Nov 20 18:15:30 UTC 2 x86_64 x86_64 x86_6
4 GNU/Linux
```

10> **apt-get** : This command is use to install the packages in system. This requires root privileges, so use the sudo command with it.



11> **chmod :** Use chmod to make a file executable and to change the permissions granted to it in Linux.

12> **hostname** : - Use hostname to know your name in your host or network. Basically, it displays your hostname and IP address



13> **ping** : Use ping to check your connection to a server. For Example- Google.com

```
durgeshmandge@durgeshmandge-VirtualBox:~$ ping google.com
PING google.com (142.250.183.206) 56(84) bytes of data.
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=1 ttl=53 time=25.3 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=2 ttl=53 time=18.7 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=3 ttl=53 time=17.5 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=4 ttl=53 time=21.3 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=5 ttl=53 time=13.5 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=6 ttl=53 time=22.3 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=7 ttl=53 time=39.1 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=8 ttl=53 time=16.1 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=9 ttl=53 time=20.9 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=10 ttl=53 time=20.9 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=11 ttl=53 time=23.8 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=12 ttl=53 time=23.7 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=13 ttl=53 time=32.8 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=14 ttl=53 time=20.2 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=15 ttl=53 time=24.9 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=16 ttl=53 time=29.4 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=17 ttl=53 time=27.4 ms
64 bytes from bom07s33-in-f14.1e100.net (142.250.183.206): icmp_seq=18 ttl=53 time=24.3 ms
```

Linux Filters :

1> **cat :** - When cat command is used inside pipes, it does nothing except moving stdin to stout.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ cat new.txt
demo.txt
durgeshmandge@durgeshmandge-VirtualBox:~$ tac new.txt
demo.txt
```

2> **cut** : Linux 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.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ cut -d- -f1 new.txt
demo.txt
```

3> **grep** : The 'grep' command stands for "global regular expression print". grep command filters the content of a file which makes our search easy.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ grep s new.txt
```

4> **comm** : The 'comm' command compares two files or streams. By default, 'comm' will always display three columns. First column indicates non-matching items of first file, second column indicates non-matching items of second file, and third column indicates matching items of both the files.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ comm new.txt demo.txt
demo.txt
```

5> **wc** : - Linux wc command helps in counting the lines, words, and characters in a file. It displays the number of lines, number of characters, and the number of words in a file.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ wc new.txt
1 1 9 new.txt
```

6> **od** : The 'od' term stands for octal dump. It displays content of a file in different humanreadable formats like hexadecimal, octal and ASCII characters.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ od -b new.txt
0000000 144 145 155 157 056 164 170 164 012
0000011
```

7> **sort** : The 'sort' command sorts the file content in an alphabetical order.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ sort new.txt
demo.txt
```

8> **gzip** : Gzip (GNU zip) is a compressing tool, which is used to truncate the file size. By default original file will be replaced by the compressed file ending with extension (.gz).

Gunzip- to decompress the file.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ gzip new.txt
durgeshmandge@durgeshmandge-VirtualBox:~$ gunzip new.txt.gz
```

Advanced Filtered Commands : -

1> **head** : Head is used to display the first parts of a file, it outputs the first 10 lines by default. You can use the -n num flag to specify the number of lines to be displayed:

```
durgeshmandge@durgeshmandge-VirtualBox:~$ head new.txt
Durgesh is Student in SPIT Mumbai , Andheri
demo.txt
```

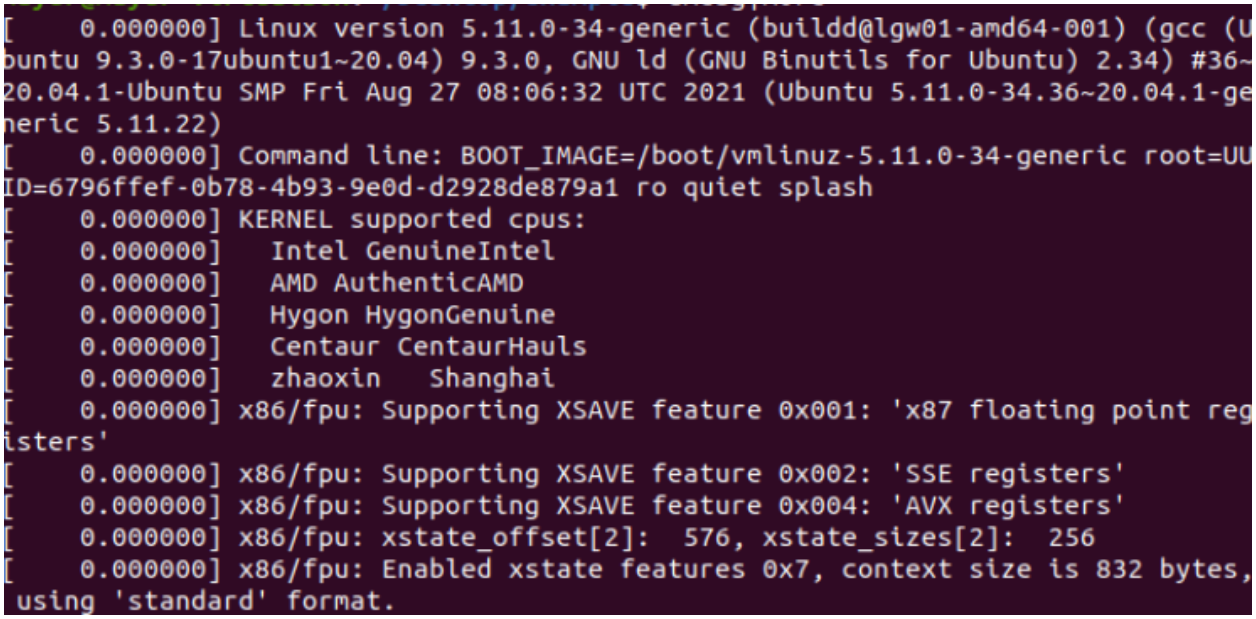
2> **tail** : - tail outputs the last parts (10 lines by default) of a file. Use the -n num switch to specify the number of lines to be displayed.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ tail new.txt
Durgesh is Student in SPIT Mumbai , Andheri
demo.txt
```

3> **fmt** : - fmt simple optimal text formatter, it reformats paragraphs in specified file and prints results to the standard output.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ fmt -w 1 new.txt
Durgesh
is
Student
in
SPIT
Mumbai
,
Andheri
demo.txt
```

4> **more :** more command is a useful file perusal filter created basically for certificate viewing. It shows file content in a page like format, where users can press [Enter] to view more information.



5> **less :** less is the opposite of more command above but it offers extra features and it's a little faster with large files.

```
[    0.000000] Linux version 5.11.0-34-generic (buildd@lgw01-amd64-001) (gcc (U
buntu 9.3.0-17ubuntu1~20.04) 9.3.0, GNU ld (GNU Binutils for Ubuntu) 2.34) #36~
20.04.1-Ubuntu SMP Fri Aug 27 08:06:32 UTC 2021 (Ubuntu 5.11.0-34.36~20.04.1-ge
neric 5.11.22)
[    0.000000] Command line: BOOT_IMAGE=/boot/vmlinuz-5.11.0-34-generic root=UU
ID=6796ffef-0b78-4b93-9e0d-d2928de879a1 ro quiet splash
[    0.000000] KERNEL supported cpus:
[    0.000000]   Intel GenuineIntel
[    0.000000]   AMD AuthenticAMD
[    0.000000]   Hygon HygonGenuine
[    0.000000]   Centaur CentaurHauls
[    0.000000]   zhaoxin   Shanghai
[    0.000000] x86/fpu: Supporting XSAVE feature 0x001: 'x87 floating point reg
isters'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x002: 'SSE registers'
[    0.000000] x86/fpu: Supporting XSAVE feature 0x004: 'AVX registers'
[    0.000000] x86/fpu: xstate_offset[2]:  576, xstate_sizes[2]:  256
[    0.000000] x86/fpu: Enabled xstate features 0x7, context size is 832 bytes,
 using 'standard' format.
[    0.000000] BIOS-provided physical RAM map:
[    0.000000] BIOS-e820: [mem 0x0000000000000000-0x000000000009fbff] usable
[    0.000000] BIOS-e820: [mem 0x000000000009fc00-0x000000000009ffff] reserved
[    0.000000] BIOS-e820: [mem 0x00000000000f0000-0x00000000000fffff] reserved
[    0.000000] BIOS-e820: [mem 0x0000000000100000-0x000000007ffeffff] usable
[    0.000000] BIOS-e820: [mem 0x000000007fff0000-0x000000007fffffff] ACPI data
[    0.000000] BIOS-e820: [mem 0x00000000fec00000-0x00000000fec00fff] reserved
[    0.000000] BIOS-e820: [mem 0x00000000fee00000-0x00000000fee00fff] reserved
[    0.000000] BIOS-e820: [mem 0x00000000fffc0000-0x00000000ffffffff] reserved
```

6> **nl** : nl is used to number the lines of our text data.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ nl new.txt
     1  Durgesh is Student in SPIT Mumbai , Andheri
     2  demo.txt
```

Start and Stop Services

Managing services in Linux with system

1) List all services

In order to manage the services, first need to know what services are available on the system. Use system command.

```
durgeshmandge@durgeshmandge-VirtualBox:~$ systemctl list-unit-files --type service -all
UNIT FILE                                  STATE           VENDOR PRESET
accounts-daemon.service                    enabled         enabled
acpid.service                              disabled        enabled
alsa-restore.service                       static          -
alsa-state.service                         static          -
alsa-utils.service                         masked          enabled
anacron.service                            enabled         enabled
apparmor.service                           enabled         enabled
apport-autoreport.service                  static          -
apport-forward@.service                    static          -
apport.service                             generated       -
apt-daily-upgrade.service                  static          -
apt-daily.service                          static          -
apt-news.service                           static          -
autovt@.service                            alias           -
avahi-daemon.service                       enabled         enabled
bluetooth.service                          enabled         enabled
bolt.service                               static          -
brltty-udev.service                        static          -
brltty.service                             disabled        enabled
colord.service                             static          -
configure-printer@.service                 static          -
console-getty.service                      disabled        disabled
console-setup.service                      enabled         enabled
container-getty@.service                   static          -
cron.service                               enabled         enabled
cryptdisks-early.service                   masked          enabled
cryptdisks.service                         masked          enabled
cups-browsed.service                       enabled         enabled
cups.service                               enabled         enabled
dbus-fi.w1.wpa_supplicant1.service         alias           -
dbus-org.bluez.service                     alias           -
dbus-org.freedesktop.Avahi.service         alias           -
dbus-org.freedesktop.hostname1.service     alias           -
dbus-org.freedesktop.locale1.service       alias           -
dbus-org.freedesktop.login1.service        alias           -
```

For running services : -

```
durgeshmandge@durgeshmandge-VirtualBox:~$ sudo systemctl | grep running
[sudo] password for durgeshmandge:
  proc-sys-fs-binfmt_misc.automount                                    loaded active     running   Arbitrary Exe
cutable File Formats File System Automount Point
  acpid.path                                                           loaded active     running   ACPI Events C
heck
  cups.path                                                            loaded active     running   CUPS Schedule
r
  init.scope                                                           loaded active     running   System and Se
rvice Manager
  session-2.scope                                                      loaded active     running   Session 2 of
User durgeshmandge
  accounts-daemon.service                                              loaded active     running   Accounts Serv
ice
  acpid.service                                                        loaded active     running   ACPI event da
emon
  avahi-daemon.service                                                 loaded active     running   Avahi mDNS/DN
S-SD Stack
  colord.service                                                       loaded active     running   Manage, Insta
ll and Generate Color Profiles
  cron.service                                                         loaded active     running   Regular backg
round program processing daemon
  cups-browsed.service                                                 loaded active     running   Make remote C
UPS printers available locally
  cups.service                                                         loaded active     running   CUPS Schedule
r
  dbus.service                                                         loaded active     running   D-Bus System
Message Bus
  gdm.service                                                          loaded active     running   GNOME Display
 Manager
  kerneloops.service                                                   loaded active     running   Tool to autom
atically collect and submit kernel crash signatures
  ModemManager.service                                                 loaded active     running   Modem Manager
  networkd-dispatcher.service                                          loaded active     running   Dispatcher da
emon for systemd-networkd
  NetworkManager.service                                               loaded active     running   Network Manag
er
  packagekit.service                                                   loaded active     running   PackageKit Da
emon
```

Start a Service : -

```
durgeshmandge@durgeshmandge-VirtualBox:~$ systemctl start brltty.service
```

Stop a service : -

```
durgeshmandge@durgeshmandge-VirtualBox:~$ systemctl stop brltty.service
```

Restart a service : -

```
durgeshmandge@durgeshmandge-VirtualBox:~$ systemctl restart brltty.service
```

Status of the service : -