# Distributed Systems (CS304)

## Assignment - 2

## **U19CS012**

Execute all commands on Linux terminal and note down the functionality of each.

1. Basic Unix/Linux commands:

(a) **ls** - to list the files and directories inside any given directory

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cn   dsa   os
```

(b) **date** - prints the current date time

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ date
Wednesday 26 January 2022 08:49:13 PM IST
```

(c) **help** - displays information about shell built-in commands

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ help help
help: help [-dms] [pattern ...]
    Display information about builtin commands.

    Displays brief summaries of builtin commands.  If PATTERN is
    specified, gives detailed help on all commands matching PATTERN,
    otherwise the list of help topics is printed.

    Options:
      -d          output short description for each topic
      -m          display usage in pseudo-manpage format
      -s          output only a short usage synopsis for each topic matching
                  PATTERN

    Arguments:
      PATTERN    Pattern specifying a help topic

    Exit Status:
    Returns success unless PATTERN is not found or an invalid option is given.
```

(d) **info** - reads documentation in the info format.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ info --help
Usage: info [OPTION]... [MENU-ITEM...]

Read documentation in Info format.

Frequently-used options:
  -a, --all                       use all matching manuals
  -k, --apropos=STRING            look up STRING in all indices of all manuals
  -d, --directory=DIR             add DIR to INFOPATH
  -f, --file=MANUAL               specify Info manual to visit
  -h, --help                      display this help and exit
      --index-search=STRING       go to node pointed by index entry STRING
  -n, --node=NODENAME             specify nodes in first visited Info file
  -o, --output=FILE               output selected nodes to FILE
  -O, --show-options, --usage     go to command-line options node
      --subnodes                  recursively output menu items
  -v, --variable VAR=VALUE        assign VALUE to Info variable VAR
      --version                   display version information and exit
  -w, --where, --location         print physical location of Info file
```

(e) **man** - to display the <u>user manual of any command</u> that we can run on the terminal.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ man printf
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ▮
```

**It will open in new window ..whole documentation {Manual} of particular command**

```
Activities        Terminal ▾            Jan 26  20:58  ●

               bhagya@bhagya-VirtualBox: ~/Desktop/ss_lab2

PRINTF(1)                      User Commands                     PRINTF(1)

NAME
       printf - format and print data

SYNOPSIS
       printf FORMAT [ARGUMENT]...
       printf OPTION

DESCRIPTION
       Print ARGUMENT(s) according to FORMAT, or execute according to OPTION:

       --help display this help and exit

       --version
              output version information and exit

       FORMAT controls the output as in C printf.  Interpreted sequences are:

       \"     double quote

       \\     backslash

       \a     alert (BEL)

       \b     backspace

       \c     produce no further output
Manual page printf(1) line 1 (press h for help or q to quit)
```

# help Vs info Vs man

`help` is a bash command. It uses internal bash structures to store and retrieve information about bash commands.

`man` is a macro set for the troff (via groff) processor. The output of processing a single file is sent to a pager by the `man` command by default.

`info` is a text-only viewer for archives in the info format output of Texinfo.

(f) **who** - is used to find out the following information :

✓ Time of last system boot
✓ Current run level of the system
✓ List of logged in users and more.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ who
bhagya    :0                    2022-01-26 20:45 (:0)
```

(g) **pwd** - short for *print working directory*, will help you to find out the absolute path of the current directory.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ pwd
/home/bhagya/Desktop/ss_lab2
```

(h) **cat** (short for "**concatenate**") - It reads data from the file and gives their content as output. It helps us to create, view, concatenate files.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ touch sample.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ gedit sample.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat sample.txt
This is Sample Text File made by U19CS012.

"Keep Striving!"
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$
```

(i) **more** - used to view the text files in the command prompt, displaying one screen at a time in case the file is large.

```
This is Sample Text File made by U19CS012.

"Keep Striving!"
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ gedit sample.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ more -d sample.txt
This is Sample Text File made by U19CS012.

"Keep Striving!"

Added [A-Z] for Long Text

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
--More--(25%)[Press space to continue, 'q' to quit.]
```

(j) **mv** -  used to <u>rename or move</u> a file or directory

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ mv sample.txt mysample.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cn  dsa  mysample.txt  os
```

(k) **rm** - used to <u>remove</u> a file, or directory

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ touch temp.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cn  dsa  mysample.txt  os  temp.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ rm temp.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cn  dsa  mysample.txt  os
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$
```

(l) **chmod** - <u>change permissions</u> of a file

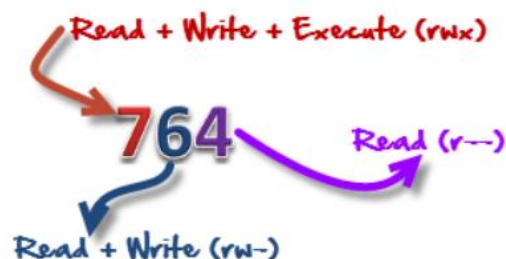| Number | Permission Type | Symbol |
|---|---|---|
| 0 | No Permission | --- |
| 1 | Execute | --x |
| 2 | Write | -w- |
| 3 | Execute + Write | -wx |
| 4 | Read | r-- |
| 5 | Read + Execute | r-x |
| 6 | Read +Write | rw- |
| 7 | Read + Write +Execute | rwx |

**Example:**

A.) Checking **Current File Permissions**

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

B.) **chmod 764** and Checking Permissions Again

```
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rw-rw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ chmod 764 p2.c
bhagya@bhagya-VirtualBox:~/Desktop/Departments/MECHANICAL/HMT$ ls -l p2.c
-rwxrw-r-- 1 bhagya bhagya 0 Jul 27 16:02 p2.c
```

(m) **whoami** - will tell you <u>which user account you are</u> using in this system

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ whoami
bhagya
```

(n) **logout** - to <u>logout from current user</u> session:

No output on screen, current user session will be logged out.

(o) **wc** - short for **word count**, help us to <u>count newlines, words and bytes</u> of a file.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat mysample.txt
This is Sample Text File made by U19CS012.
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ wc -l mysample.txt
1 mysample.txt         1 Line
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ wc -w mysample.txt
8 mysample.txt         8 Words
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$
```

(p) **grep** - <u>filter searches a file</u> for a particular pattern of characters, and displays all lines that contain that pattern.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat mysample.txt
This is Sample Text File for unix commands made by U19CS012.

Unix Looks Interesting!

This line does not contain word.
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ grep -i "unix" mysample.txt
This is Sample Text File for unix commands made by U19CS012.
Unix Looks Interesting!
```

(q) **sort** - filter searches a file for a <u>particular pattern</u> of characters, and displays all lines that contain that pattern.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat names.txt
raju
prakash
rohan
bheem
dora
doraemon
nobita
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ sort names.txt
bheem
dora
doraemon
nobita
prakash
raju
rohan
```

(r) **mkdir** - allows the user to <u>create directories</u>

(s) **rmdir** - allows the user to <u>remove directories</u>

(t) **cd** – (**change directory**) , used to <u>change current working</u> directory.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ mkdir cartoon
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cartoon  cn  dsa  mysample.txt  names.txt  os
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cd cartoon/
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2/cartoon$ cd ../
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cartoon  cn  dsa  mysample.txt  names.txt  os
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ rmdir cartoon
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
cn  dsa  mysample.txt  names.txt  os
```

(u) **tail** - print the <u>last N number</u> of data of the given input.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat names.txt
raju
prakash
rohan
bheem
dora
doraemon
nobita
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ tail -3 names.txt
dora
doraemon
nobita
```

(v) **cmp** - used to <u>compare the two files byte by byte</u> and helps you to find out whether the two files are identical or not.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cmp a.txt b.txt
a.txt b.txt differ: byte 1, line 1
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat a.txt
A B C D E
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat b.txt
A B B D E
```

```
$cmp file1.txt file2.txt
```

1. **If the files are not identical :** the output of the above command will be :

```
$cmp file1.txt file2.txt
file1.txt file2.txt differ: byte 9, line 2


 /*indicating that the first mismatch found in
 two files at byte 20 in second line*/
```

2. **If the files are identical :** you will see something like this on your screen:

```
$cmp file1.txt file2.txt
$ _
/*indicating that the files are identical*/
```



(w) **diff** - used to <u>display the differences in the files</u> by comparing the files <u>line by line.</u>

(x) **cp (copy)** - used to copy files or group of files or directory.

*[If the 2nd file doesn't exist, then first it creates one and content is copied to it. But if it existed then it is simply overwritten without any warning.]*

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat a.txt
A B C D E
A B D D E
A B B D E
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
a.txt  b.txt   cn  dsa   mysample.txt  names.txt   os
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cp a.txt tmp.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ls
a.txt  b.txt   cn  dsa   mysample.txt  names.txt   os   tmp.txt
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ cat tmp.txt
A B C D E
A B D D E
A B B D E
```

(y) **clear** – to clear the screen

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ clear
```

**After Enter Key is Pressed, the Screen will be Cleared**

(z) **df** - **(disk free)**, used to display info related to file systems about total space and available space.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ df
Filesystem      1K-blocks      Used Available Use% Mounted on
udev              987368         0    987368   0% /dev
tmpfs             203500      1360    202140   1% /run
/dev/sda5       19992176   8688412  10265172  46% /
tmpfs            1017484         0   1017484   0% /dev/shm
tmpfs               5120         4      5116   1% /run/lock
tmpfs            1017484         0   1017484   0% /sys/fs/cgroup
/dev/loop0           128       128         0 100% /snap/bare/5
/dev/loop1         56832     56832         0 100% /snap/core18/2074
/dev/loop2         56960     56960         0 100% /snap/core18/2284
/dev/loop3         63488     63488         0 100% /snap/core20/1270
/dev/loop4        224256    224256         0 100% /snap/gnome-3-34-1804/72
/dev/loop5        224256    224256         0 100% /snap/gnome-3-34-1804/77
/dev/loop6        253952    253952         0 100% /snap/gnome-3-38-2004/87
/dev/loop7         66688     66688         0 100% /snap/gtk-common-themes/1515
/dev/loop8         66816     66816         0 100% /snap/gtk-common-themes/1519
/dev/loop9         52224     52224         0 100% /snap/snap-store/547
/dev/loop10        55552     55552         0 100% /snap/snap-store/558
/dev/loop12        44544     44544         0 100% /snap/snapd/14549
/dev/loop13        44416     44416         0 100% /snap/snapd/14295
/dev/sda1         523248         4    523244   1% /boot/efi
tmpfs             203496        28    203468   1% /run/user/1000
/dev/sr0           59650     59650         0 100% /media/bhagya/VBox_GAs_6.1.24
```
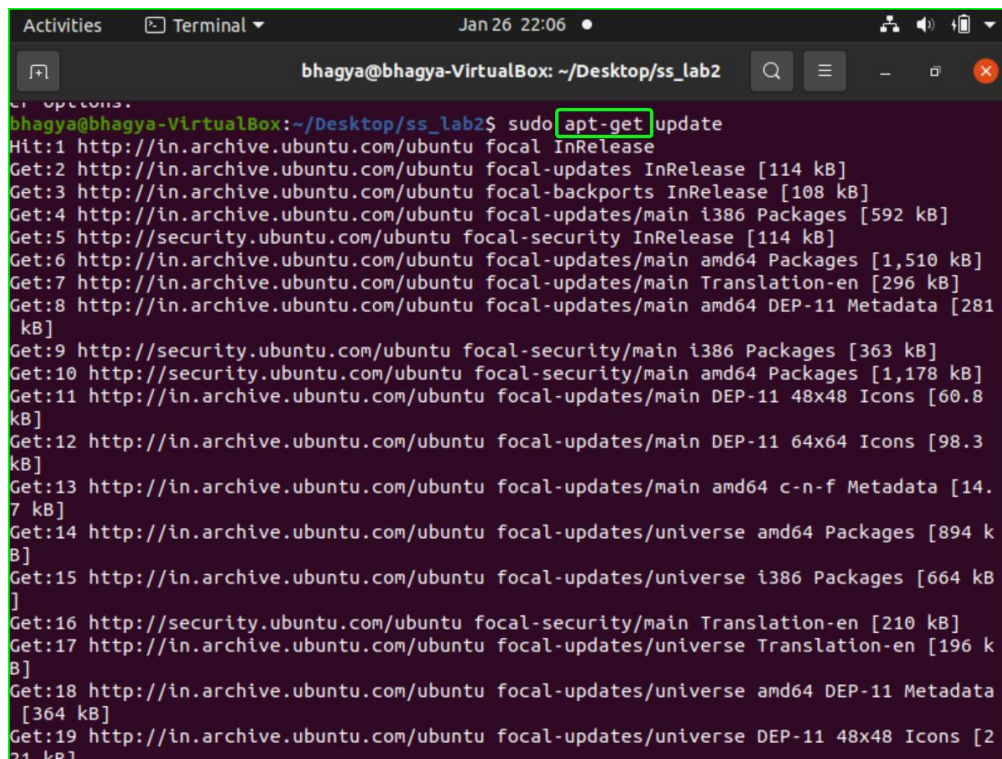
(1) **du** – (**disk usage**), is used to <u>estimate file space usage</u>.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ du -h /home/bhagya/Desktop/
28K       /home/bhagya/Desktop/os_lab_2
244K      /home/bhagya/Desktop/ss_lab1
4.0K      /home/bhagya/Desktop/Departments/MECHANICAL/HMT
4.0K      /home/bhagya/Desktop/Departments/MECHANICAL/MP
4.0K      /home/bhagya/Desktop/Departments/MECHANICAL/DM
16K       /home/bhagya/Desktop/Departments/MECHANICAL
8.0K      /home/bhagya/Desktop/Departments/COED/DataStructure
12K       /home/bhagya/Desktop/Departments/COED
4.0K      /home/bhagya/Desktop/Departments/ELECTRICAL/CAEE
4.0K      /home/bhagya/Desktop/Departments/ELECTRICAL/LM
4.0K      /home/bhagya/Desktop/Departments/ELECTRICAL/ATTE
16K       /home/bhagya/Desktop/Departments/ELECTRICAL
48K       /home/bhagya/Desktop/Departments
4.0K      /home/bhagya/Desktop/ss_lab2/cn
4.0K      /home/bhagya/Desktop/ss_lab2/os
4.0K      /home/bhagya/Desktop/ss_lab2/dsa
36K       /home/bhagya/Desktop/ss_lab2
360K      /home/bhagya/Desktop/
```

(2) **uname** - displays the <u>information about the system</u>.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ uname -a
Linux bhagya-VirtualBox 5.8.0-63-generic #71~20.04.1-Ubuntu SMP Thu Jul 15 17:46:08 UTC
 2021 x86_64 x86_64 x86_64 GNU/Linux
```

(3) **apt-get** - command-line tool which helps in <u>handling packages</u> in Linux.

```
Activities    Terminal ▾                    Jan 26 22:06 ●

                    bhagya@bhagya-VirtualBox: ~/Desktop/ss_lab2

cr options:
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ sudo apt-get update
Hit:1 http://in.archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://in.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu focal-updates/main i386 Packages [592 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1,510 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu focal-updates/main Translation-en [296 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [281
 kB]
Get:9 http://security.ubuntu.com/ubuntu focal-security/main i386 Packages [363 kB]
Get:10 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1,178 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu focal-updates/main DEP-11 48x48 Icons [60.8
kB]
Get:12 http://in.archive.ubuntu.com/ubuntu focal-updates/main DEP-11 64x64 Icons [98.3
kB]
Get:13 http://in.archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [14.
7 kB]
Get:14 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [894 k
B]
Get:15 http://in.archive.ubuntu.com/ubuntu focal-updates/universe i386 Packages [664 kB
]
Get:16 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [210 kB]
Get:17 http://in.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [196 k
B]
Get:18 http://in.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata
 [364 kB]
Get:19 http://in.archive.ubuntu.com/ubuntu focal-updates/universe DEP-11 48x48 Icons [2
21 kB]
```

**(4) find** - command line utility for <u>walking a file hierarchy</u>. It can be used to find files and directories and perform subsequent operations on them.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ find . -name  mysample.txt
./mysample.txt
```

**(5) wget** - non-interactive <u>network downloader</u> which is used to download files from the server even when the user has not logged on to the system and it can work in the background without hindering the current process.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ wget https://www.google.com
--2022-01-26 22:10:20--  https://www.google.com/
Resolving www.google.com (www.google.com)... 172.217.174.68, 2404:6800:4009:815::2004
Connecting to www.google.com (www.google.com)|172.217.174.68|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: unspecified [text/html]
Saving to: 'index.html'

index.html                    [ <=>                      ]  17.63K  --.-KB/s    in 0.02s

2022-01-26 22:10:20 (830 KB/s) - 'index.html' saved [18056]
```

**(6) top** - used to show the <u>Linux processes.</u>

(7) **mpstate** - used to report <u>processor related statistics</u>.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ mpstat
Linux 5.8.0-63-generic (bhagya-VirtualBox)        26/01/22            _x86_64_            (1 CPU)

10:16:32 PM IST  CPU     %usr    %nice    %sys %iowait    %irq   %soft  %steal  %guest  %
gnice    %idle
10:16:32 PM IST  all     3.95     3.15    1.66    0.14    0.00    0.10    0.00    0.00
 0.00    90.99
```

(8) **netstat** - displays various <u>network related information</u> such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc.,

```
Activities        Terminal ▼                     Jan 26 22:18  ●

                    bhagya@bhagya-VirtualBox: ~/Desktop/ss_lab2

Processing triggers for man-db (2.9.1-1) ...
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address          Foreign Address         State
tcp        0      0 localhost:domain        0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
udp        0      0 0.0.0.0:56330           0.0.0.0:*
udp        0      0 localhost:domain        0.0.0.0:*
udp        0      0 bhagya-VirtualBo:bootpc _gateway:bootps         ESTABLISHED
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 0.0.0.0:631             0.0.0.0:*
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 [::]:37238              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type       State         I-Node   Path
unix  2      [ ACC ]     SEQPACKET  LISTENING     15190    /run/udev/control
unix  2      [ ACC ]     STREAM     LISTENING     15163    /run/systemd/private
unix  2      [ ]         DGRAM                    31721    /run/user/1000/systemd/notif
y
unix  2      [ ACC ]     STREAM     LISTENING     15165    /run/systemd/userdb/io.syste
md.DynamicUser
unix  2      [ ACC ]     STREAM     LISTENING     31724    /run/user/1000/systemd/priva
te
unix  2      [ ACC ]     STREAM     LISTENING     31758    /run/user/1000/bus
unix  2      [ ]         DGRAM                    15174    /run/systemd/journal/syslog
unix  2      [ ACC ]     STREAM     LISTENING     15176    /run/systemd/fsck.progress
unix  2      [ ACC ]     STREAM     LISTENING     31759    /run/user/1000/gnupg/S.dirmn
```

**(9) sar [System Activity Report]** - It can be used to monitor Linux system's resources like CPU usage, Memory utilization, I/O devices consumption, Network monitoring, Disk usage, process and thread allocation, battery performance, Plug and play devices, Processor performance, file system and more.

```
gfg@gfg-Lenovo-G50-80:~$ sar -h
Usage: sar [ options ] [ <interval> [ <count> ] ]
Main options and reports:
        -B      Paging statistics
        -b      I/O and transfer rate statistics
        -d      Block devices statistics
        -F [ MOUNT ]
                Filesystems statistics
        -H      Hugepages utilization statistics
        -I { <int> | SUM | ALL | XALL }
                Interrupts statistics
        -m { <keyword> [,...] | ALL }
                Power management statistics
                Keywords are:
                CPU     CPU instantaneous clock frequency
                FAN     Fans speed
                FREQ    CPU average clock frequency
                IN      Voltage inputs
                TEMP    Devices temperature
                USB     USB devices plugged into the system
        -n { <keyword> [,...] | ALL }
                Network statistics
                Keywords are:
                DEV     Network interfaces
                EDEV    Network interfaces (errors)
                NFS     NFS client
                NFSD    NFS server
                SOCK    Sockets (v4)
                IP      IP traffic      (v4)
                EIP     IP traffic      (v4) (errors)
                ICMP    ICMP traffic    (v4)
                EICMP   ICMP traffic    (v4) (errors)
                TCP     TCP traffic     (v4)
                ETCP    TCP traffic     (v4) (errors)
                UDP     UDP traffic     (v4)
                SOCK6   Sockets (v6)
                IP6     IP traffic      (v6)
                EIP6    IP traffic      (v6) (errors)
                ICMP6   ICMP traffic    (v6)
```

**(10) chown** - used to change the file Owner or group. Whenever you want to change ownership you can use chown command.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab1$ ls -l a.c
-rw-rw-r-- 1 bhagya bhagya 529 Jan 20 07:33 a.c
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab1$ sudo chown root a.c
[sudo] password for bhagya:
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab1$ chown -c root a.c
chown: changing ownership of 'a.c': Operation not permitted
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab1$ ls -l a.c
-rw-rw-r-- 1 root bhagya 529 Jan 20 07:33 a.c
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab1$
```

## 2. Linux commands related with process:

**(a) ps (Process Status)** - for <u>viewing information related with the processes</u> on a system

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ps
    PID TTY          TIME CMD
   7521 pts/0    00:00:00 bash
   7577 pts/0    00:00:00 ps
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$
```

**(b) kill** - built-in command which is used to <u>terminate processes manually</u>.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ kill -l
 1) SIGHUP        2) SIGINT        3) SIGQUIT       4) SIGILL        5) SIGTRAP
 6) SIGABRT       7) SIGBUS        8) SIGFPE        9) SIGKILL      10) SIGUSR1
11) SIGSEGV      12) SIGUSR2      13) SIGPIPE      14) SIGALRM      15) SIGTERM
16) SIGSTKFLT    17) SIGCHLD      18) SIGCONT      19) SIGSTOP      20) SIGTSTP
21) SIGTTIN      22) SIGTTOU      23) SIGURG       24) SIGXCPU      25) SIGXFSZ
26) SIGVTALRM    27) SIGPROF      28) SIGWINCH     29) SIGIO        30) SIGPWR
31) SIGSYS       34) SIGRTMIN     35) SIGRTMIN+1   36) SIGRTMIN+2   37) SIGRTMIN+3
38) SIGRTMIN+4   39) SIGRTMIN+5   40) SIGRTMIN+6   41) SIGRTMIN+7   42) SIGRTMIN+8
43) SIGRTMIN+9   44) SIGRTMIN+10  45) SIGRTMIN+11  46) SIGRTMIN+12  47) SIGRTMIN+13
48) SIGRTMIN+14  49) SIGRTMIN+15  50) SIGRTMAX-14  51) SIGRTMAX-13  52) SIGRTMAX-12
53) SIGRTMAX-11  54) SIGRTMAX-10  55) SIGRTMAX-9   56) SIGRTMAX-8   57) SIGRTMAX-7
58) SIGRTMAX-6   59) SIGRTMAX-5   60) SIGRTMAX-4   61) SIGRTMAX-3   62) SIGRTMAX-2
63) SIGRTMAX-1   64) SIGRTMAX
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ ps
    PID TTY          TIME CMD
   7521 pts/0    00:00:00 bash
   7583 pts/0    00:00:00 ps
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ kill 7583
bash: kill: (7583) - No such process
```

**(c) background processing (with &)** - To run a <u>command in the background</u>, add the ampersand symbol (&) at the end of the command.

```
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ sleep 15 &
[1] 7599          ←———— Background Process
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ bg
bash: bg: job 1 already in background
bhagya@bhagya-VirtualBox:~/Desktop/ss_lab2$ bg
bash: bg: job has terminated
[1]+  Done                    sleep 15
```

**SUBMITTED BY**: U19CS012

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