

LINUX ASSIGNMENT

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1. BASIC COMMANDS:

Commands are actually files containing programs, often written in C. How will you find out in which directory does the file corresponding to the man command resides?

ANS: type man

```
bgmadhavan@bgm-virtual-machine: ~  
bgmadhavan@bgm-virtual-machine:~$ type man  
man is /usr/bin/man  
bgmadhavan@bgm-virtual-machine:~$
```

How will you find out what is the use of the ps command.

ANS: man ps or whatis ps

```
PS(1)                                User Commands                                PS(1)  
  
NAME  
    ps - report a snapshot of the current processes.  
  
SYNOPSIS  
    ps [options]  
  
DESCRIPTION  
    ps displays information about a selection of the active processes.  If  
    you want a repetitive update of the selection and the displayed  
    information, use top instead.  
  
    This version of ps accepts several kinds of options:  
  
    1  UNIX options, which may be grouped and must be preceded by a dash.  
    2  BSD options, which may be grouped and must not be used with a dash.  
    3  GNU long options, which are preceded by two dashes.  
  
    Options of different types may be freely mixed, but conflicts can  
    appear.  There are some synonymous options, which are functionally  
    identical, due to the many standards and ps implementations that this  
    ps is compatible with.  
  
--More--
```

```
bgmadhavan@bgm-virtual-machine:~$ whatis ps
ps (1)          - report a snapshot of the current processes.
```

2. GENERAL UTILITIES:

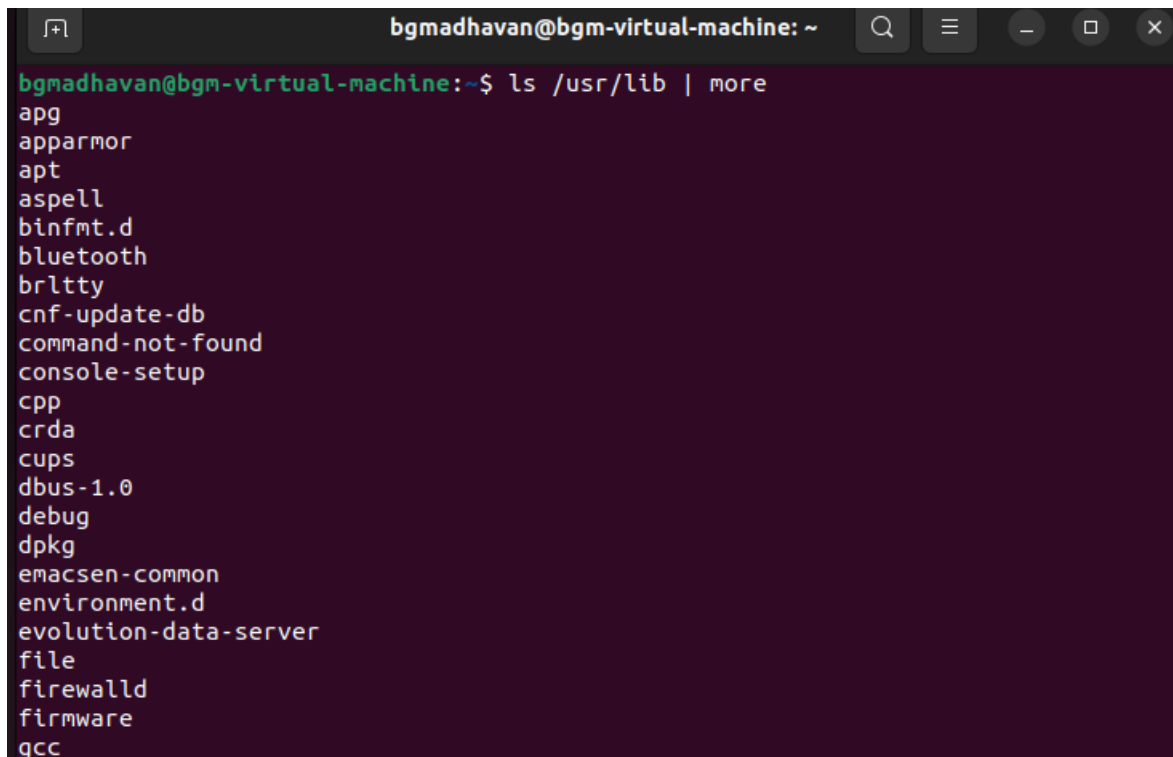
1) Display the calendar for the month of March 2012

ANS: cal mar 2012

```
bgmadhavan@bgm-virtual-machine:~$ cal mar 2012
      March 2012
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
```

2) List all the files and directories of the directory /usr/lib on the terminal. Now put the same information in a file named results. Display the contents of the file results now.

ANS: `ls /usr/lib`
`ls /usr/lib -l > results`
`cat results`

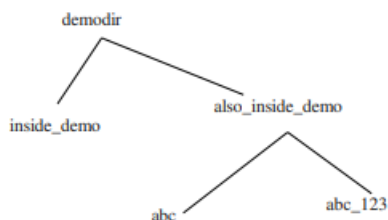


```
bgmadhavan@bgm-virtual-machine: ~
bgmadhavan@bgm-virtual-machine:~$ ls /usr/lib | more
apg
apparmor
apt
aspell
binfmt.d
bluetooth
brltty
cnf-update-db
command-not-found
console-setup
cpp
crda
cups
dbus-1.0
debug
dpkg
enacsen-common
environment.d
evolution-data-server
file
firewalld
firmware
gcc
```

```
bgmadhavan@bgm-virtual-machine: ~  
bgmadhavan@bgm-virtual-machine:~$ ls /usr/lib -l > results  
bgmadhavan@bgm-virtual-machine:~$ cat results  
total 600  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 appg  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 apparmor  
drwxr-xr-x 5 root root 4096 Aug 8 04:23 apt  
drwxr-xr-x 3 root root 4096 Aug 8 04:23 aspell  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 binfmt.d  
drwxr-xr-x 2 root root 4096 Aug 8 04:24 bluetooth  
drwxr-xr-x 2 root root 4096 Aug 8 04:24 brltty  
-rwxr-xr-x 1 root root 1075 Dec 8 2021 cnf-update-db  
-rwxr-xr-x 1 root root 3565 Dec 8 2021 command-not-found  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 console-setup  
lrwxrwxrwx 1 root root 21 Sep 7 18:06 cpp -> /etc/alternatives/cpp  
drwxr-xr-x 2 root root 4096 Aug 8 04:24 crda  
drwxr-xr-x 10 root root 4096 Aug 8 04:23 cups  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 dbus-1.0  
drwxr-xr-x 3 root root 4096 Aug 8 04:24 debug  
drwxr-xr-x 3 root root 4096 Aug 8 04:23 dpkg  
drwxr-xr-x 3 root root 4096 Aug 8 04:23 emacsens-common  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 environment.d  
drwxr-xr-x 7 root root 4096 Aug 8 04:24 evolution-data-server  
drwxr-xr-x 2 root root 4096 Aug 8 04:23 file  
drwxr-xr-x 3 root root 4096 Aug 8 04:24 firewallld
```

3.File System

1)Make a directory structure like this in your home directory



```
Ans: mkdir demodir  
cd demodir  
mkdir inside demo also inside demo/abc abc_123
```

```
bgmadhavan@bgm-virtual-machine:~$ tree demodir  
demodir  
├── also_inside_demo  
│   ├── abc  
│   └── abc_123  
└── inside_demo  
4 directories, 0 files
```

2) Remove the also_inside_demo directory

```
Ans: cd also_inside_demo  
rmdir abc abc_123  
cd ..  
rmdir also_inside_demo
```

```

bgmadhavan@bgm-virtual-machine:~$ cd demodir/
bgmadhavan@bgm-virtual-machine:~/demodir$ rm -R also_inside_demo/
bgmadhavan@bgm-virtual-machine:~/demodir$ ls
inside_demo
bgmadhavan@bgm-virtual-machine:~/demodir$

```

4. FILE ATTRIBUTES:

1. Create a file abc.txt and change the ownership of this file to some other user on your machine, and also change the group to family.

Ans: `cat > abc.txt`
`sudo chown newowner abc.txt`

```

bgmadhavan@bgm-virtual-machine:~/demodir$ ls -l
total 8
-rw-rw-r-- 1 sam          bgmadhavan   13 Sep 14 11:58 abc.txt
drwxrwxr-x 2 bgmadhavan bgmadhavan 4096 Sep 14 11:51 inside_demo

```

2. Create a file exercise.txt and make it executable.

Ans: `cat > exercise.txt`
`chmod =x exercise.txt`

```

bgmadhavan@bgm-virtual-machine:~/demodir$ ls -l
total 12
-rw-rw-r-- 1 sam          bgmadhavan   13 Sep 14 11:58 abc.txt
---x---x--x 1 bgmadhavan bgmadhavan   13 Sep 14 12:03 exercise.txt
drwxrwxr-x 2 bgmadhavan bgmadhavan 4096 Sep 14 11:51 inside_demo

```

3. Create a file test.txt on your desktop and identify its inode number, also create a softlink for test.txt in your home.

Ans: `cat > test.txt`
`ls -li test.txt`
`ln -s test.txt soft.txt`

```

bgmadhavan@bgm-virtual-machine:~/demodir$ ls -li
919571 abc.txt 919574 exercise.txt 919557 inside_demo 919590 test.txt
bgmadhavan@bgm-virtual-machine:~/demodir$

```

```

bgmadhavan@bgm-virtual-machine:~/demodir$ ls -li
919571 abc.txt          919590 hardlink.txt 919599 soft.txt
919574 exercise.txt    919557 inside_demo 919590 test.txt
bgmadhavan@bgm-virtual-machine:~/demodir$

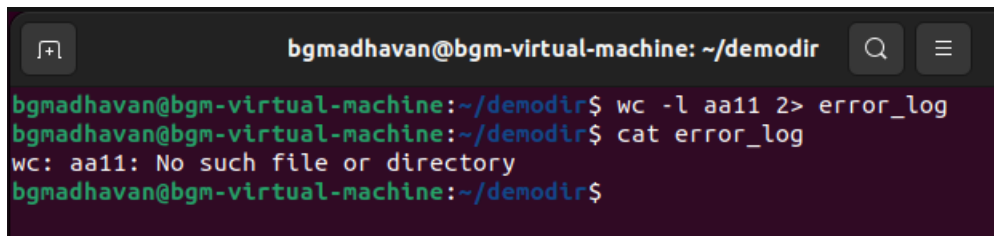
```

5.Redirection pipes:

1. Create a file name error_log in your current directory. Suppose you do not have any file named aa11 in your current directory.

How can you redirect the error message to the file error_log when we apply the command "wc -l aa11" ?

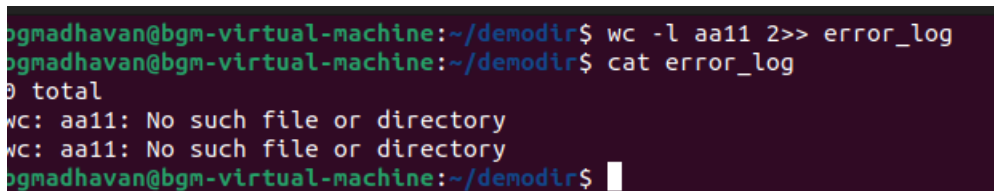
Ans: wc -l aa11 > error_log.txt

A terminal window titled 'bgmadhavan@bgm-virtual-machine: ~/demodir'. It shows the command 'wc -l aa11 2> error_log' being executed, followed by 'cat error_log' which outputs 'wc: aa11: No such file or directory'.

```
bgmadhavan@bgm-virtual-machine: ~/demodir
bgmadhavan@bgm-virtual-machine:~/demodir$ wc -l aa11 2> error_log
bgmadhavan@bgm-virtual-machine:~/demodir$ cat error_log
wc: aa11: No such file or directory
bgmadhavan@bgm-virtual-machine:~/demodir$
```

How can you ensure that all the error log are appended to the errorlog file?

Ans: wc -l aa11 >> error_log.txt

A terminal window titled 'bgmadhavan@bgm-virtual-machine: ~/demodir'. It shows the command 'wc -l aa11 2>> error_log' being executed, followed by 'cat error_log' which outputs '0 total' and 'wc: aa11: No such file or directory' twice.

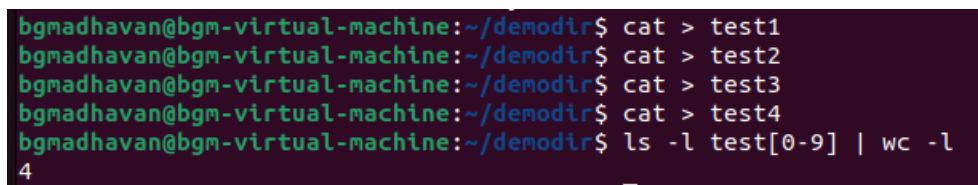
```
bgmadhavan@bgm-virtual-machine:~/demodir$ wc -l aa11 2>> error_log
bgmadhavan@bgm-virtual-machine:~/demodir$ cat error_log
0 total
wc: aa11: No such file or directory
wc: aa11: No such file or directory
bgmadhavan@bgm-virtual-machine:~/demodir$
```

2. Create files named test1, test2, testa, testb

How can you count the number of files starting with test and then having only one digit in their name using only a single line command ?

Ans:
cat > test1
cat > test2
cat > testa
cat > testb

command: ls -l test[0-9] | wc -l

A terminal window titled 'bgmadhavan@bgm-virtual-machine: ~/demodir'. It shows the creation of four files (test1, test2, test3, test4) using 'cat >'. Then, the command 'ls -l test[0-9] | wc -l' is executed, outputting '4'.

```
bgmadhavan@bgm-virtual-machine:~/demodir$ cat > test1
bgmadhavan@bgm-virtual-machine:~/demodir$ cat > test2
bgmadhavan@bgm-virtual-machine:~/demodir$ cat > test3
bgmadhavan@bgm-virtual-machine:~/demodir$ cat > test4
bgmadhavan@bgm-virtual-machine:~/demodir$ ls -l test[0-9] | wc -l
4
```

6. Working with Linux Process:

1. Open a terminal. Now spawn three shell processes one after another i.e. first spawn one shell, then from the spawned shell, spawn one new shell and so on. Now, how can you see the PID of the current shell ? How can you see the PID of the shell which is the grandparent of the current shell?

Ans: open a terminal enter command 'bash'

Enter bash again to get child terminal

To get PID of current terminal: echo \$\$

To get PID of grandparent : pstree -p | grep PID_of_current bash

```
bgmadhavan@bgm-vir... x bgmadhavan@bgm-vir... x bgmadhavan@bgm-vir... x
bgmadhavan@bgm-virtual-machine:~/demodir$ echo $$
448
bgmadhavan@bgm-virtual-machine:~/demodir$ pstree -p | grep 3448
|                                     | -bash(3448)-+-grep(3455)
bgmadhavan@bgm-virtual-machine:~/demodir$
```

2. How can you see all the processes (both system & user processes) in your computer? The output can be quite large. How can you view the output as multipage output ? How can you store the output in a file named process_info?

Ans: To view all the process: ps -ef

Multipage output: ps -ef | less

Ps -ef > process_info

```
bgmadhavan@bgm-vir... x bgmadhavan@bgm-vir... x bgmadhavan@bgm-vir... x
root      2435      2  0 11:31 ?        00:00:24 [kworker/0:0-pm]
root      2777      2  0 11:36 ?        00:00:03 [kworker/u256:2-events_freez
ble_power_]
bgmadha+  2847      1236  0 11:41 ?        00:00:01 gjs /usr/share/gnome-shell/e
tensions/ding@rastersoft.com/ding.js -E -P /usr/share/gnome-shell/extensions/di
g@rastersoft.com -M 0 -D 0:0:979:436:1:27:0:0:0:0
root      2966      2  0 11:48 ?        00:00:06 [kworker/1:2-events]
root      3005      2  0 11:50 ?        00:00:00 [kworker/1:3-events]
root      3246      2  0 12:19 ?        00:00:01 [kworker/u256:3-events_freez
ble_power_]
root      3382      2  0 12:32 ?        00:00:00 [kworker/u256:0-events_unbou
d]
root      3405      2  0 12:37 ?        00:00:00 [kworker/0:2-events]
root      3410      2  0 12:42 ?        00:00:00 [kworker/0:1-events]
bgmadha+  3429      1923  0 12:46 pts/0    00:00:00 bash
bgmadha+  3435      1905  0 12:46 pts/1    00:00:00 bash
bgmadha+  3442      3435  0 12:46 pts/1    00:00:00 bash
bgmadha+  3448      1905  0 12:46 pts/2    00:00:00 bash
root      3473      2  0 12:49 ?        00:00:00 [kworker/u256:1-flush-8:0]
bgmadha+  3474      3448  0 12:49 pts/2    00:00:00 ps -ef
bgmadha+  3475      3448  0 12:49 pts/2    00:00:00 less
bgmadhavan@bgm-virtual-machine:~/demodir$
```

7 .Linux Environment

1. How can you know what is the secondary command prompt set your system ? How can you change the secondary command prompt from the default to your username ?

Ans: `echo $PS2`

To set ps2 to our username: `PS2="$USERNAME> "`

```
bgmadhavan@bgm-virtual-machine:~/demodir$ echo $PS2
>
bgmadhavan@bgm-virtual-machine:~/demodir$ PS2="$USERNAME >"
bgmadhavan@bgm-virtual-machine:~/demodir$ echo $PS2
bgmadhavan >
bgmadhavan@bgm-virtual-machine:~/demodir$
```

2. How can you ensure that the mv command (used for renaming a file) always asks for permission before overwriting an existing destination file ?

Ans: `mv -i file1 destination.`

```
bgmadhavan@bgm-virtual-machine:~/demodir$ mv -i test1 inside_demo
mv: overwrite 'inside_demo/test1'? Y
bgmadhavan@bgm-virtual-machine:~/demodir$
```

1) Create a new user account and home directory called "Duck"

Ans: `sudo adduser`

Enter the password

Sudo adduser Duck

```
duck1@bgm-virtual-machine:/home/bgmadhavan$ id
uid=1002(duck1) gid=1002(duck1) groups=1002(duck1)
duck1@bgm-virtual-machine:/home/bgmadhavan$
```

2) Set the user account "Duck's" expiry date as 07 - 01 - 2015

Ans: `sudo usermod -e 2015-01-07 duck`

```
duck1@bgm-virtual-machine:/home/bgmadhavan$ cd
duck1@bgm-virtual-machine:~$ su bgmadhavan
Password:
bgmadhavan@bgm-virtual-machine:/home/duck1$ sudo usermod -e 2023-09-15 duck1
bgmadhavan@bgm-virtual-machine:/home/duck1$
```

3) find the id of the user account "Duck"

Ans: `id -u duck`

```
bgmadhavan@bgm-virtual-machine:/home/duck1$ sudo usermod -e 2023-
bgmadhavan@bgm-virtual-machine:/home/duck1$ id -u duck1
1002
bgmadhavan@bgm-virtual-machine:/home/duck1$
```

4) Type df and du commands and see the output on your terminal.

Ans: df

Du

```
bgmadhavan@bgm-virtual-machine:/home/duck1$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
tmpfs            396452      2000    394452   1% /run
/dev/sda3       19946096 13172728   5734828  70% /
tmpfs           1982240        0   1982240   0% /dev/shm
tmpfs           5120         4     5116   1% /run/lock
/dev/sda2       524252      6216   518036   2% /boot/efi
tmpfs           396448      116   396332   1% /run/user/1000
/dev/sr1        4919592 4919592        0 100% /media/bgmadhavan/Ubuntu 22.04.
3 LTS amd64
/dev/sr0        159128   159128        0 100% /media/bgmadhavan/CDROM
```

```
bgmadhavan@bgm-virtual-machine:/home$ du
du: cannot read directory './duck': Permission denied
4      ./duck
4      ./bgmadhavan/.config/gnome-session/saved-session
8      ./bgmadhavan/.config/gnome-session
4      ./bgmadhavan/.config/update-notifier
8      ./bgmadhavan/.config/gtk-3.0
12     ./bgmadhavan/.config/ibus/bus
16     ./bgmadhavan/.config/ibus
68     ./bgmadhavan/.config/pulse
4      ./bgmadhavan/.config/goa-1.0
8      ./bgmadhavan/.config/dconf
4      ./bgmadhavan/.config/nautilus
16     ./bgmadhavan/.config/evolution/sources
20     ./bgmadhavan/.config/evolution
156    ./bgmadhavan/.config
12     ./bgmadhavan/.local/share/keyrings
4      ./bgmadhavan/.local/share/icc
4      ./bgmadhavan/.local/share/sounds
4      ./bgmadhavan/.local/share/flatpak/db
8      ./bgmadhavan/.local/share/flatpak
4      ./bgmadhavan/.local/share/ibus-table
76     ./bgmadhavan/.local/share/gvfs-metadata
```

5) Type this command on the terminal and see the output :

`du -ch *.txt`

Ans: du -ch *.txt

6) Delete the user account "Duck" permanently along with its home folder.

Ans: sudo userdel -r duck

8.Simple Filters

Head	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to get the first 10 lines from /etc/passwd 2. try to get just the first 3 lines from /etc/passwd

Ans: head /etc/passwd

```
bgmadhavan@bgm-virtual-machine:/$ head etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
bgmadhavan@bgm-virtual-machine:/$
```

head -n5 /etc/passwd

```
bgmadhavan@bgm-virtual-machine:/$ head -n5 etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
bgmadhavan@bgm-virtual-machine:/$
```

Tail	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to get the Last 10 lines from /etc/passwd 2. Try to get just the Last 3 lines from /etc/passwd 3. Try to follow the log file /var/log/auth.log

Ans: i) tail etc/passwd

```
bgmadhavan@bgm-virtual-machine:/$ tail etc/passwd
nm-openvpn:x:121:127:NetworkManager OpenVPN,,,:/var/lib/openvpn/chroot:/usr/sbin/nologin
saned:x:122:129::/var/lib/saned:/usr/sbin/nologin
colord:x:123:130:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:124:131::/var/lib/geoclue:/usr/sbin/nologin
pulse:x:125:132:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:126:65534::/run/gnome-initial-setup:/bin/false
hplip:x:127:7:HPLIP system user,,,:/run/hplip:/bin/false
gdm:x:128:134:Gnome Display Manager:/var/lib/gdm3:/bin/false
bgmadhavan:x:1000:1000:gokulamadhavan,,,:/home/bgmadhavan:/bin/bash
sam:x:1001:1001:sam,,,:/home/sam:/bin/bash
bgmadhavan@bgm-virtual-machine:/$
```

ii) tail -n3 etc/passwd

```
bgmadhavan@bgm-virtual-machine:/$ tail -n5 etc/passwd
gnome-initial-setup:x:126:65534::/run/gnome-initial-setup:/bin/false
hplip:x:127:7:HPLIP system user,,,:/run/hplip:/bin/false
gdm:x:128:134:Gnome Display Manager:/var/lib/gdm3:/bin/false
bgmadhavan:x:1000:1000:gokulamadhavan,,,:/home/bgmadhavan:/bin/bash
sam:x:1001:1001:sam,,,:/home/sam:/bin/bash
bgmadhavan@bgm-virtual-machine:/$
```

iii) tail -f /var/log/auth.log

```
bgmadhavan@bgm-virtual-machine: /
bgmadhavan@bgm-virtual-machine:/$ tail -f /var/log/auth.log
Sep 14 13:25:12 bgm-virtual-machine sudo: pam_unix(sudo:session): session opened for user root(uid=0) by (uid=1000)
Sep 14 13:25:12 bgm-virtual-machine userdel[3780]: delete user 'duck1'
Sep 14 13:25:12 bgm-virtual-machine userdel[3780]: removed group 'duck1' owned by 'duck1'
Sep 14 13:25:12 bgm-virtual-machine userdel[3780]: removed shadow group 'duck1' owned by 'duck1'
Sep 14 13:25:12 bgm-virtual-machine sudo: pam_unix(sudo:session): session closed for user root
Sep 14 13:25:48 bgm-virtual-machine sudo: bgmadhavan : TTY=pts/0 ; PWD=/home ; USER=root ; COMMAND=/usr/sbin/userdel -r duck
Sep 14 13:25:48 bgm-virtual-machine sudo: pam_unix(sudo:session): session opened for user root(uid=0) by (uid=1000)
Sep 14 13:25:48 bgm-virtual-machine sudo: pam_unix(sudo:session): session closed for user root
Sep 14 13:30:01 bgm-virtual-machine CRON[3834]: pam_unix(cron:session): session opened for user root(uid=0) by (uid=0)
Sep 14 13:30:01 bgm-virtual-machine CRON[3834]: pam_unix(cron:session): session closed for user root
```

Sort	
Assignment i	Try what is shown on the video
Assignment ii	<ol style="list-style-type: none"> 1. Try to sort the file <code>/etc/passwd</code> in ascending order. 2. Try to sort the file <code>/etc/passwd</code> in descending order. 3. Try to sort the file <code>/etc/passwd</code> in ascending order based on the 3rd column. 4. Try to sort the file <code>/etc/passwd</code> in ascending order based on the 3rd column and ask sort to look at the third column as a whole number.

Ans: i) `sudo sort etc/passwd`

```
bgmadhavan@bgm-virtual-machine:/$ sort etc/passwd
_apt:x:105:65534::/nonexistent:/usr/sbin/nologin
avahi-autoipd:x:110:119:Avahi autoip daemon,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
avahi:x:114:121:Avahi mDNS daemon,,:/run/avahi-daemon:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
bgmadhavan:x:1000:1000:gokulamadhavan,,:/home/bgmadhavan:/bin/bash
bin:x:2:2:bin:/bin:/usr/sbin/nologin
colord:x:123:130:colord colour management daemon,,:/var/lib/colord:/usr/sbin/nologin
cups-pk-helper:x:115:122:user for cups-pk-helper service,,:/home/cups-pk-helper:/usr/sbin/nologin
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,:/var/lib/misc:/usr/sbin/nologin
fwupd-refresh:x:120:126:fwupd-refresh user,,:/run/systemd:/usr/sbin/nologin
games:x:5:60:games:/usr/games:/usr/sbin/nologin
gdm:x:128:134:Gnome Display Manager:/var/lib/gdm3:/bin/false
geoclue:x:124:131:/var/lib/geoclue:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin)/var/lib/gnats:/usr/sbin/nologin
gnome-initial-setup:x:126:65534:/run/gnome-initial-setup:/bin/false
hplip:x:127:7:HPLIP system user,,:/run/hplip:/bin/false
```

ii) `sudo sort -r etc/passwd`

```
bgmadhavan@bgm-virtual-machine:/$ sort -r etc/passwd
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
whoopsie:x:117:124:/nonexistent:/bin/false
uidd:x:107:116:/run/uidd:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
usbmux:x:111:46:usbmux daemon,,:/var/lib/usbmux:/usr/sbin/nologin
tss:x:106:113:TPM software stack,,:/var/lib/tpm:/bin/false
tcpdump:x:109:118:/nonexistent:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
systemd-timesync:x:103:106:systemd Time Synchronization,,:/run/systemd:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,:/run/systemd:/usr/sbin/nologin
systemd-oom:x:108:117:systemd Userspace OOM Killer,,:/run/systemd:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,:/run/systemd:/usr/sbin/nologin
syslog:x:104:111:/home/syslog:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
```

iii) sudo sort -t: -k3,3 etc/passwd

```
bgmadhavan@bgm-virtual-machine:/$ sort -t: -k3,3 etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
bgmadhavan:x:1000:1000:gokulamadhavan,,,:/home/bgmadhavan:/bin/bash
sam:x:1001:1001:sam,,,:/home/sam:/bin/bash
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:102:105:/:nonexistent:/usr/sbin/nologin
systemd-timesync:x:103:106:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
syslog:x:104:111:/:home/syslog:/usr/sbin/nologin
_apt:x:105:65534:/:nonexistent:/usr/sbin/nologin
tss:x:106:113:TPM software stack,,,:/var/lib/tpm:/bin/false
uidd:x:107:116:/:run/uidd:/usr/sbin/nologin
systemd-oom:x:108:117:systemd Userspace OOM Killer,,,:/run/systemd:/usr/sbin/nologin
tcpdump:x:109:118:/:nonexistent:/usr/sbin/nologin
avahi-autoipd:x:110:119:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:111:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
```

iv) sudo sort -t: -k3,3 etc/passwd

```
bgmadhavan@bgm-virtual-machine:/$ sort -t: -k3,3 etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
bgmadhavan:x:1000:1000:gokulamadhavan,,,:/home/bgmadhavan:/bin/bash
sam:x:1001:1001:sam,,,:/home/sam:/bin/bash
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd:/usr/sbin/nologin
messagebus:x:102:105:/:nonexistent:/usr/sbin/nologin
systemd-timesync:x:103:106:systemd Time Synchronization,,,:/run/systemd:/usr/sbin/nologin
syslog:x:104:111:/:home/syslog:/usr/sbin/nologin
_apt:x:105:65534:/:nonexistent:/usr/sbin/nologin
tss:x:106:113:TPM software stack,,,:/var/lib/tpm:/bin/false
uidd:x:107:116:/:run/uidd:/usr/sbin/nologin
systemd-oom:x:108:117:systemd Userspace OOM Killer,,,:/run/systemd:/usr/sbin/nologin
tcpdump:x:109:118:/:nonexistent:/usr/sbin/nologin
avahi-autoipd:x:110:119:Avahi autoip daemon,,,:/var/lib/avahi-autoipd:/usr/sbin/nologin
usbmux:x:111:46:usbmux daemon,,,:/var/lib/usbmux:/usr/sbin/nologin
dnsmasq:x:112:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
```

Cut	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to cut just the usernames from the file /etc/passwd

Ans: cut marks.txt -d " " -f2

```
bgmadhavan@bgm-virtual-machine:~/demodir$ cat > marks.txt
100 gokul
200 rohit
300 kohli
400 ishanth
500 sai
bgmadhavan@bgm-virtual-machine:~/demodir$ cut marks.txt -d " " -f2
gokul
rohit
kohli
ishanth
sai
bgmadhavan@bgm-virtual-machine:~/demodir$
```

sudo cut etc/passwd -d: -f1

```
bgmadhavan@bgm-virtual-machine:/$ cut etc/passwd -d: -f1
root
daemon
bin
sys
sync
games
man
lp
mail
news
uucp
proxy
www-data
backup
list
irc
gnats
nobody
systemd-network
systemd-resolve
messagebus
systemd-timesync
syslog
```

Paste	
Assignment i	Try what is shown on the video
Assignment ii	<ol style="list-style-type: none"> 1. Create a file alphabets.txt and key in all the 26 alphabets each one in a new line. 2. Create a file number.txt and key in 1 to 26 each one in a new line. 3. Try to paste those two files, to see which letter appears at what number. <p>Paste alphabets.txt numbers.txt</p>

Ans : i) paste numbers.txt marks.txt

```
bgmadhavan@bgm-virtual-machine:/$ cd /home/bgmadhavan/demodir
bgmadhavan@bgm-virtual-machine:~/demodir$ cat > serialno
1
2
3
4
5bgmadhavan@bgm-virtual-machine:~/demodir$ paste serialno marks.txt
1      100 gokul
2      200 rohit
3      300 kohli
4      400 ishanth
5      500 sai
bgmadhavan@bgm-virtual-machine:~/demodir$
```

ii) 1. Cat > alphabet.txt

2. cat > number.txt

3. paste alphabets.txt numbers.txt

```
bgmadhavan@bgm-virtual-machine:~/demodir$ paste numbers alphabet.txt
1      a
2      b
3      c
4      d
5      e
6      f
7      g
8      h
9      i
10     j
11     k
12     l
13     m
14     n
15     o
16     p
17     q
18     r
19     s
20     t
21     u
```

9. Grep command

Explore some other commands like -E, + and ?

Ans: -E - extended regular expression: it is used to find longer more complex patterns when used with other meta characters such as '+' or '?'

'+' - it is a meta character used to find continuous occurrence of some patterns ex: `grep -E '[a-z]+' text.txt`

'?' - another meta character that acts like a ternary operator
Ex: `grep -E 'colou?r' text.txt`

10. More on grep command

1) List those entries that are 5 letters long and starts with Y

Ans: `grep -E '^Y[a-zA-Z]{4}$' test.txt`

```
bgmadhavan@bgm-virtual-machine:~/demodir$ grep -E '^Y[a-zA-Z]{4}$' test.txt
Yesss
bgmadhavan@bgm-virtual-machine:~/demodir$
```

11. sed command

1) Use the same text file seddemo.txt

2) Try to print records from 6th to 12th line.

Ans: `sed -n '6,12p' seddemo.txt`

```
bgmadhavan@bgm-virtual-machine:~/demodir$ sed -n '6,12p' seddemo.txt
X006|Mohan Kumar|computers|67|Incomplete|0
W007|Sandeep|civil|2|Fail|0
A008|Yogesh|computers|91|Pass|8000
S009|Yojna chaudhury|electronics|38|Incomplete|1000
A010|Zubin|Computers|12|Fail|1500
C011|Mira Nair|electronics|66|Pass|7000
X012|Meera Banik|civil|76|Pass|6300
bgmadhavan@bgm-virtual-machine:~/demodir$
```

12. More on sed command:

1) Use the same text file seddemo.txt

2) Try to replace or substitute name Ankit with Ashish

Ans: `sed 's/ankit/ashish/g' seddemo.txt`


```
bgmadhavan@bgm-virtual-machine:~/demodir$ sed 's/ankit/ashish/g' seddemo.txt
A001|Anirban Roy Choudhury|computers|95|Pass|8000
A002|Ankit Pilonia|electronics|98|Pass|8900
C003|Ankit Saraf|civil|32|Fail|2000
S004|Goutam kumar Kumar|chemical|77|Pass|7700
A005|Mani Chowdhari|electrical|23|Fail|2000
X006|Mohan Kumar|computers|67|Incomplete|0
W007|Sandeep|civil|2|Fail|0
A008|Yogesh|computers|91|Pass|8000
S009|Yojna choudhury|electronics|38|Incomplete|1000
A010|Zubin|Computers|12|Fail|1500
C011|Mira Nair|electronics|66|Pass|7000
X012|Meera Banik|civil|76|Pass|6300
W013|Meeraa Roy|civil|41|Pass|4000
```