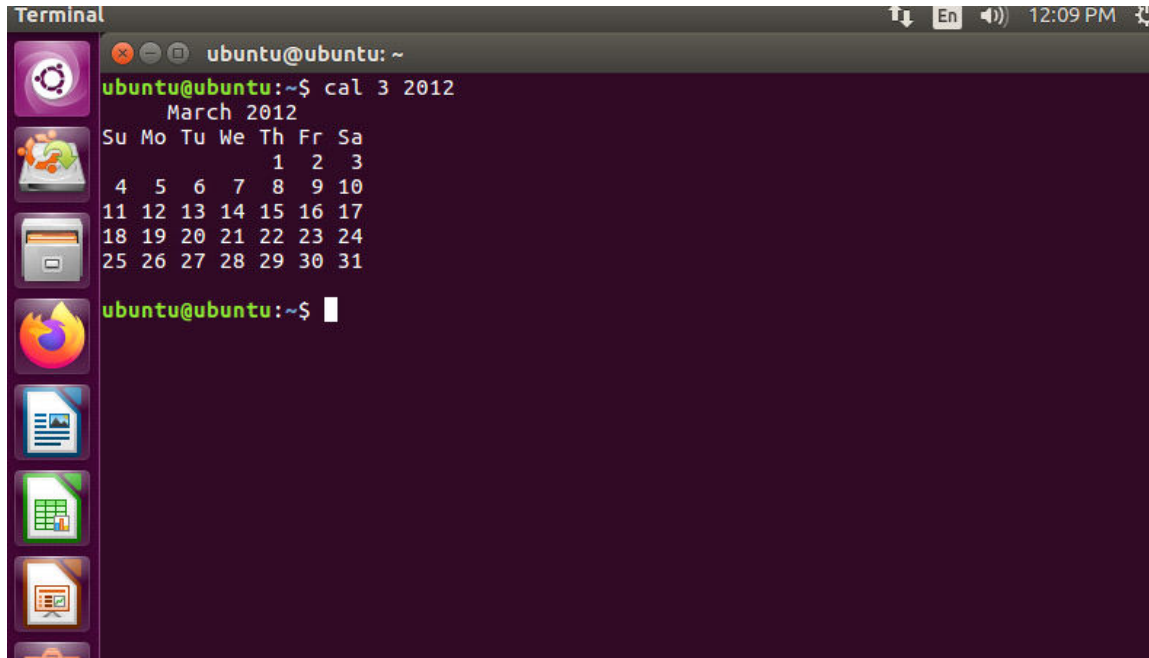


LINUX OPERATING SYSTEM

ASSIGNMENTS

General Purpose Utility In Linux:

1) Display the calendar for the month of March 2012

A terminal window titled "Terminal" with a dark purple background. The window shows the command prompt "ubuntu@ubuntu: ~" and the command "cal 3 2012" entered. The output displays the calendar for March 2012, showing the days of the week (Su, Mo, Tu, We, Th, Fr, Sa) and the corresponding dates (1 through 31). The terminal window also shows a sidebar with various application icons on the left and system status icons (network, volume, battery) on the right.

```
Terminal
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ cal 3 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
ubuntu@ubuntu:~$
```

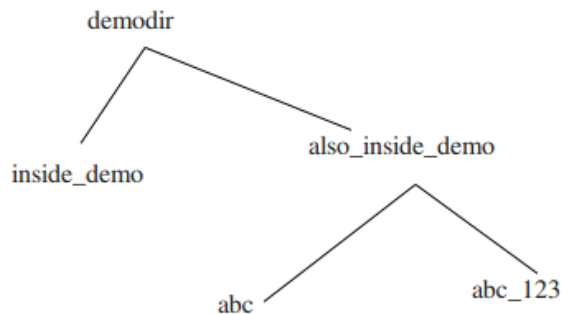
2) List all the files and directories of the directory /usr/lib on the terminal. Now put the same information in a file named results.

Display the contents of the file results now.

```
ubuntu@ubuntu: ~  
ubuntu@ubuntu:~$ ls -la /usr/lib > results  
ubuntu@ubuntu:~$ cat results  
total 449  
drwxr-xr-x 151 root root    160 Mar  5 12:06 .  
drwxr-xr-x  15 root root    100 Mar  5 12:06 ..  
drwxr-xr-x   2 root root     38 Aug  6 2020 accountsservice  
drwxr-xr-x   3 root root     32 Aug  6 2020 aisleriot  
drwxr-xr-x   2 root root     26 Aug  6 2020 apg  
drwxr-xr-x   4 root root     88 Aug  6 2020 apt  
drwxr-xr-x   3 root root   3434 Aug  6 2020 aspell  
drwxr-xr-x   2 root root     67 Aug  6 2020 at-spi2-core  
drwxr-xr-x   2 root root     48 Aug  6 2020 avahi  
drwxr-xr-x   2 root root      3 Apr 12 2016 binfmt.d  
drwxr-xr-x   2 root root     65 Aug  6 2020 bluetooth  
drwxr-xr-x   2 root root     38 Aug  6 2020 casper  
drwxr-xr-x   2 root root     43 Aug  6 2020 cheese  
drwxr-xr-x   2 root root     70 Aug  6 2020 colord  
-rwxr-xr-x   1 root root   3283 Jun 20 2016 command-not-found  
drwxr-xr-x   2 root root     25 Aug  6 2020 compat-ld  
drwxr-xr-x   3 root root     32 Aug  6 2020 compiz  
drwxr-xr-x  10 root root    143 Aug  6 2020 cups  
drwxr-xr-x   2 root root     48 Aug  6 2020 dbus-1.0  
drwxr-xr-x   2 root root     36 Aug  6 2020 dconf  
drwxr-xr-x   5 root root     66 Aug  6 2020 debug  
drwxr-xr-x   4 root root     52 Aug  6 2020 dpkg  
drwxr-xr-x   2 root root     56 Aug  6 2020 ecryptfs  
drwxr-xr-x   2 root root     41 Aug  6 2020 eject  
drwxr-xr-x   3 root root    155 Aug  6 2020 emacsen-common  
drwxr-xr-x   2 root root     37 Aug  6 2020 environment.d  
drwxr-xr-x   4 root root     71 Aug  6 2020 eog  
drwxr-xr-x   2 root root     30 Aug  6 2020 evince  
drwxr-xr-x   2 root root    340 Aug  6 2020 evolution
```

File System:

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



```

ubuntu@ubuntu:~$ mkdir ~/demodir
ubuntu@ubuntu:~$ mkdir ~/demodir/inside_demo
ubuntu@ubuntu:~$ mkdir ~/demodir/also_inside_demo
ubuntu@ubuntu:~$ mkdir ~/demodir/also_inside_demo/abc
ubuntu@ubuntu:~$ mkdir ~/demodir/also_inside_demoabc_123
ubuntu@ubuntu:~$ ls ~/demodir -R
/home/ubuntu/demodir:
also_inside_demo  also_inside_demoabc_123  inside_demo

/home/ubuntu/demodir/also_inside_demo:
abc

/home/ubuntu/demodir/also_inside_demo/abc:

/home/ubuntu/demodir/also_inside_demoabc_123:

/home/ubuntu/demodir/inside_demo:
ubuntu@ubuntu:~$ mkdir ~/demodir
mkdir: cannot create directory '/home/ubuntu/demodir': File exists
ubuntu@ubuntu:~$ mkdir ~/demodir/also_inside_demo/abc_123
ubuntu@ubuntu:~$ ls ~/demodir -R
/home/ubuntu/demodir:
also_inside_demo  also_inside_demoabc_123  inside_demo

/home/ubuntu/demodir/also_inside_demo:
abc  abc_123

/home/ubuntu/demodir/also_inside_demo/abc:

/home/ubuntu/demodir/also_inside_demo/abc_123:

```

2) Remove the also_inside_demo directory

```

ubuntu@ubuntu:~$ rm -r also_inside_demo
rm: cannot remove 'also_inside_demo': No such file or directory
ubuntu@ubuntu:~$ ls ~/demodir -R

```

Basic Commands:

1) 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?

```

ubuntu@ubuntu:~$ which man
/usr/bin/man
ubuntu@ubuntu:~$ █

```

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

```

ubuntu@ubuntu:~$ man ps
ubuntu@ubuntu:~$

```

```

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(1) 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.

    Note that "ps -aux" is distinct from "ps aux".  The POSIX and UNIX standards
    require that "ps -aux" print all processes owned by a user named "x", as well
    as printing all processes that would be selected by the -a option.  If the
    user named "x" does not exist, this ps may interpret the command as "ps aux"
    instead and print a warning.  This behavior is intended to aid in
    transitioning old scripts and habits.  It is fragile, subject to change, and
    thus should not be relied upon.

    By default, ps selects all processes with the same effective user ID
    (euid=EUID) as the current user and associated with the same terminal as the
    invoker.  It displays the process ID (pid=PID), the terminal associated with
    Manual page ps(1) line 1 (press h for help or q to quit)

```

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.

```

ubuntu@ubuntu:~$ man ps
ubuntu@ubuntu:~$ touch abc.txt
ubuntu@ubuntu:~$ sudo chown otheruser abc.txt
chown: invalid user: 'otheruser'
ubuntu@ubuntu:~$ sudo chown hello abc.txt
chown: invalid user: 'hello'
ubuntu@ubuntu:~$ cut -d: -f1 /etc/passwd | sort
_apt
avahi
avahi-autoipd
backup
...
ubuntu@ubuntu:~$ sudo chown mail abc.txt
ubuntu@ubuntu:~$ sudo chown :family abc.txt
chown: invalid group: ':family'
ubuntu@ubuntu:~$ sudo groupadd family
ubuntu@ubuntu:~$ ls -l abc.txt
-rw-rw-r-- 1 mail ubuntu 0 Mar  5 12:32 abc.txt
ubuntu@ubuntu:~$

```

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

```
ubuntu@ubuntu:~$ touch exercise.txt
ubuntu@ubuntu:~$ chmod +x exercise.txt
ubuntu@ubuntu:~$ ls -l exercise.txt
-rwxrwxr-x 1 ubuntu ubuntu 0 Mar  5 12:44 exercise.txt
ubuntu@ubuntu:~$
```

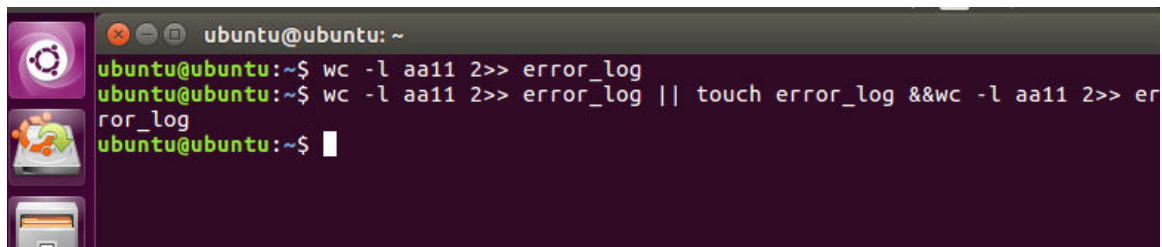
3. Create a file test.txt on your desktop and identify its inode number, also create a softlink for test.txt in your home.

```
ubuntu@ubuntu:~$ touch ~/Desktop/test.txt
ubuntu@ubuntu:~$ ls -li ~/Desktop/test.txt
19121 /home/ubuntu/Desktop/test.txt
ubuntu@ubuntu:~$ ls -s ~/Desktop/test.txt ~/test_softlink.txt
```

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

```
ubuntu@ubuntu:~$ wc -l aa11 2>> error_log
ubuntu@ubuntu:~$
```



```
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ wc -l aa11 2>> error_log
ubuntu@ubuntu:~$ wc -l aa11 2>> error_log || touch error_log && wc -l aa11 2>> error_log
ubuntu@ubuntu:~$
```

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 ?

```
ubuntu@ubuntu:~$ touch test1
ubuntu@ubuntu:~$ touch test2
ubuntu@ubuntu:~$ ls -d test[0-9] | wc -l
2
ubuntu@ubuntu:~$
```


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.

```
ubuntu@ubuntu:~$ bash
ubuntu@ubuntu:~$ bash
ubuntu@ubuntu:~$ bash
ubuntu@ubuntu:~$
```

2. 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?

```
ubuntu@ubuntu:~$ echo "current shell PID : $$"
current shell PID : 4720
ubuntu@ubuntu:~$ echo "grandfather shell PID : $(ps -o ppid= -p $(ps -o ppid= -p
$$))"
grandfather shell PID : 4700
ubuntu@ubuntu:~$
```

3. How can you see all the processes (both system & user processes) in your computer? The output can be quite large.

```
ubuntu@ubuntu:~$ ps aux
```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	0.3	0.2	119808	5920	?	Ss	10:42	0:06	/sbin/init splash
root	2	0.0	0.0	0	0	?	S	10:42	0:00	[kthreadd]
root	4	0.0	0.0	0	0	?	I<	10:42	0:00	[kworker/0:0H]
root	6	0.0	0.0	0	0	?	I<	10:42	0:00	[mm_percpu_wq]
root	7	0.0	0.0	0	0	?	S	10:42	0:00	[ksoftirqd/0]
root	8	0.0	0.0	0	0	?	I	10:42	0:00	[rcu_sched]
root	9	0.0	0.0	0	0	?	I	10:42	0:00	[rcu_bh]
root	10	0.0	0.0	0	0	?	S	10:42	0:00	[migration/0]
root	11	0.0	0.0	0	0	?	S	10:42	0:00	[watchdog/0]
root	12	0.0	0.0	0	0	?	S	10:42	0:00	[cpuhp/0]
root	13	0.0	0.0	0	0	?	S	10:42	0:00	[kdevtmpfs]
root	14	0.0	0.0	0	0	?	I<	10:42	0:00	[netns]
root	15	0.0	0.0	0	0	?	S	10:42	0:00	[rcu_tasks_kthr]
root	16	0.0	0.0	0	0	?	S	10:42	0:00	[kauditd]
root	17	0.0	0.0	0	0	?	S	10:42	0:00	[khungtaskd]
root	18	0.0	0.0	0	0	?	S	10:42	0:00	[oom_reaper]
root	19	0.0	0.0	0	0	?	I<	10:42	0:00	[writeback]
root	20	0.0	0.0	0	0	?	S	10:42	0:00	[kcompactd0]
root	21	0.0	0.0	0	0	?	SN	10:42	0:00	[ksmd]

4. How can you view the output as multi-page output?

```
ubuntu@ubuntu:~$ ps aux | less
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu: ~
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.3  0.2 119808 5920 ?        Ss   10:42   0:06 /sbin/init splash
sh --- maybe-ubiquity
root         2  0.0  0.0      0     0 ?        S    10:42   0:00 [kthreadd]
root         4  0.0  0.0      0     0 ?        I<   10:42   0:00 [kworker/0:0H]
root         6  0.0  0.0      0     0 ?        I<   10:42   0:00 [mm_percpu_wq]
root         7  0.0  0.0      0     0 ?        S    10:42   0:00 [ksoftirqd/0]
root         8  0.0  0.0      0     0 ?        I    10:42   0:00 [rcu_sched]
root         9  0.0  0.0      0     0 ?        I    10:42   0:00 [rcu_bh]
root        10  0.0  0.0      0     0 ?        S    10:42   0:00 [migration/0]
root        11  0.0  0.0      0     0 ?        S    10:42   0:00 [watchdog/0]
root        12  0.0  0.0      0     0 ?        S    10:42   0:00 [cpuhp/0]
root        13  0.0  0.0      0     0 ?        S    10:42   0:00 [kdevtmpfs]
root        14  0.0  0.0      0     0 ?        I<   10:42   0:00 [netns]
root        15  0.0  0.0      0     0 ?        S    10:42   0:00 [rcu_tasks_kthre
e]
root        16  0.0  0.0      0     0 ?        S    10:42   0:00 [kauditd]
root        17  0.0  0.0      0     0 ?        S    10:42   0:00 [khungtaskd]
root        18  0.0  0.0      0     0 ?        S    10:42   0:00 [oom_reaper]
root        19  0.0  0.0      0     0 ?        I<   10:42   0:00 [writeback]
root        20  0.0  0.0      0     0 ?        S    10:42   0:00 [kcompactd0]
root        21  0.0  0.0      0     0 ?        SN   10:42   0:00 [ksmd]
root        22  0.0  0.0      0     0 ?        SN   10:42   0:00 [khugepaged]
:
```

5. How can you store the output in a file named process_info?

```
root      4731  0.0  0.0      0     0 ?        I    11:09   0:00 [kworker/u2:1]
ubuntu    4735  0.0  0.1  44432  3280 pts/4    R+   11:14   0:00 ps aux
ubuntu@ubuntu:~$ ps aux | less
ubuntu@ubuntu:~$ ps aux > process_info
ubuntu@ubuntu:~$
```

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?

```
ubuntu@ubuntu:~$ echo $ps2
ubuntu@ubuntu:~$ export ps2="ubuntu"
ubuntu@ubuntu:~$
```

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

[Hint : use alias command]

```
ubuntu@ubuntu:~$ alias mv="mv -i"
ubuntu@ubuntu:~$ mv file.txt abc.txt
mv: cannot stat 'file.txt': No such file or directory
ubuntu@ubuntu:~$
```

Basic Of System Administration

- 1) Create a new user account and home directory called "Duck"
- 2) Set the user account "Duck's" expiry date as 07 - 01 - 2015
- 3) find the id of the user account "Duck"
- 4) Type df and du commands and see the output on your terminal.
- 5) Type this command on the terminal and see the output : du -ch *.txt
- 6) Delete the user account "Duck" permanently along with its home folder

```
ubuntu@ubuntu:~$ sudo useradd -m Duck
ubuntu@ubuntu:~$ sudo chage -E 2015-07-01 Duck
ubuntu@ubuntu:~$ id Duck
uid=1000(Duck) gid=1000(Duck) groups=1000(Duck)
ubuntu@ubuntu:~$ df
Filesystem      1K-blocks    Used Available Use% Mounted on
udev            999532         0    999532   0% /dev
tmpfs           204104     3712    200392   2% /run
/dev/sr0        1658112  1658112         0 100% /cdrom
/dev/loop0      1595136  1595136         0 100% /rofs
aufs            1020516    50144    970372   5% /
tmpfs           1020516     340    1020176   1% /dev/shm
tmpfs           5120         8       5112   1% /run/lock
tmpfs           1020516         0    1020516   0% /sys/fs/cgroup
tmpfs           1020516     132    1020384   1% /tmp
tmpfs           204104     108    203996   1% /run/user/999
ubuntu@ubuntu:~$ du
0  ./gconf
0  ./gnupg/private-keys-v1.d
0  ./gnupg
0  ./Videos
0  ./Pictures
0  ./Music
0  ./Documents
0  ./Public
0  ./Templates
0  ./Downloads
4  ./cache/logrotate
0  ./cache/evolution/tasks/trash
0  ./cache/evolution/tasks
```



```
4      ../.config/evolution/sources
4      ../.config/evolution
12     ../.config/libaccounts-glib
0      ../.config/gnome-session/saved-session
0      ../.config/gnome-session
8      ../.config/compiz-1/compizconfig
8      ../.config/compiz-1
0      ../.config/upstart
4      ../.config/ibus/bus
4      ../.config/ibus
4      ../.config/gtk-3.0
80     ../.config/pulse
16     ../.config/dconf
0      ../.config/ubuntu-system-settings
152    ../.config
24     ../Desktop
1216   .
ubuntu@ubuntu:~$ du -ch *.txt
du: cannot access '*.txt': No such file or directory
0      total
ubuntu@ubuntu:~$ sudo pkill -u Duck
ubuntu@ubuntu:~$ sudo userdel -r Duck
userdel: Duck mail spool (/var/mail/Duck) not found
ubuntu@ubuntu:~$
```

Simple Filters:

Title of script: Simple Filters's Assignment

Author: Balasubramaniam S N

Keywords: Simple Filter's Assignment

All the solutions are present in *Italics*.

Assignment For Topic	Questions
Head	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to get the first 10 lines from <code>/etc/passwd</code> 2. try to get just the first 3 lines from <code>/etc/passwd</code>
Tail	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to get the Last 10 lines from <code>/etc/passwd</code> 2. Try to get just the Last 3 lines from <code>/etc/passwd</code> 3. Try to follow the log file <code>/var/log/auth.log</code>
Sort	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to sort the file <code>/etc/passwd</code> in assending order. 2. Try to sort the file <code>/etc/passwd</code> in decending order. 3. Try to sort the file <code>/etc/passwd</code> in assending order based on the 3 rd column. 4. Try to sort the file <code>/etc/passwd</code> in assending order based on the 3 rd column and ask sort to look at the thrird column as a whole number.
Cut	
Assignment i	Try what is shown on the video
Assignment ii	1. Try to cut just the usernames from the file <code>/etc/passwd</code>
Paste	
Assignment i	Try what is shown on the video
Assignment ii	1. Create a file <code>alphabets.txt</code> and key in all the 26 alphabets each one in a new line. 2. Create a file <code>number.txt</code> 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. <i>Paste alphabets.txt numbers.txt</i>

```
ubuntu@ubuntu:~$ head -n 10 /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
ubuntu@ubuntu:~$ head -n 3 /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
ubuntu@ubuntu:~$
```

```
ubuntu@ubuntu:~$ tail -n 10 /etc/passwd
colord:x:122:129:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/nologin
geoclue:x:123:130:,:/var/lib/geoclue:/usr/sbin/nologin
pulse:x:124:131:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
gnome-initial-setup:x:125:65534:,:/run/gnome-initial-setup:/bin/false
hplip:x:126:7:HPLIP system user,,,:/run/hplip:/bin/false
gdm:x:127:133:Gnome Display Manager:/var/lib/gdm3:/bin/false
anisha:x:1000:1000:anisha,,,:/home/anisha:/bin/bash
olivia:x:1001:1001:,:/home/olivia:/bin/sh
mary:x:1002:1003:,,,:/home/mary:/bin/bash
olive:x:1003:1004:,:/home/olive:/bin/sh
ubuntu@ubuntu:~$ tail -n 3 /etc/passwd
olivia:x:1001:1001:,:/home/olivia:/bin/sh
mary:x:1002:1003:,,,:/home/mary:/bin/bash
olive:x:1003:1004:,:/home/olive:/bin/sh
ubuntu@ubuntu:~$
```



```

ubuntu@ubuntu:~$ sudo tail -f /var/log/auth.log
[sudo] password for anisha:
Mar  3 19:32:38 anisha-virtual-machine sudo: pam_unix(sudo:session): session cl
osed for user root
Mar  3 19:32:53 anisha-virtual-machine sudo: anisha : TTY=pts/0 ; PWD=/home/a
nisha ; USER=root ; COMMAND=/usr/sbin/userdel -r Duck
Mar  3 19:32:53 anisha-virtual-machine sudo: pam_unix(sudo:session): session op
ened for user root(uid=0) by (uid=1000)
Mar  3 19:32:53 anisha-virtual-machine userdel[7585]: delete user 'Duck'
Mar  3 19:32:53 anisha-virtual-machine userdel[7585]: removed group 'Duck' owne
d by 'Duck'
Mar  3 19:32:53 anisha-virtual-machine userdel[7585]: removed shadow group 'Duc
k' owned by 'Duck'
Mar  3 19:32:53 anisha-virtual-machine sudo: pam_unix(sudo:session): session cl
osed for user root
Mar  3 19:46:28 anisha-virtual-machine gdm-password]: gkr-pam: unlocked login k
eyring
Mar  3 19:48:48 anisha-virtual-machine sudo: anisha : TTY=pts/0 ; PWD=/home/a
nisha ; USER=root ; COMMAND=/usr/bin/tail -f /var/log/auth.log
Mar  3 19:48:48 anisha-virtual-machine sudo: pam_unix(sudo:session): session op
ened for user root(uid=0) by (uid=1000)

```

```

ubuntu@ubuntu:~$ sort /etc/passwd
anisha:x:1000:1000:anisha,,,:/home/anisha:/bin/bash
_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
bin:x:2:2:bin:/bin:/usr/sbin/nologin
colord:x:122:129:colord colour management daemon,,,:/var/lib/colord:/usr/sbin/no
login
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
games:x:5:60:games:/usr/games:/usr/sbin/nologin
gdm:x:127:133:Gnome Display Manager:/var/lib/gdm3:/bin/false
geoclue:x:123:130:/:/var/lib/geoclue:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologi
n
gnome-initial-setup:x:125:65534:/:/run/gnome-initial-setup:/bin/false
hplip:x:126:7:HPLIP system user,,,:/run/hplip:/bin/false
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
kernoops:x:113:65534:Kernel Oops Tracking Daemon,,,:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin

```

```
ubuntu@ubuntu: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
uuid:x:107:115::/run/uuid:/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:106:112:TPM software stack,,,:/var/lib/tpm:/bin/false
tcpdump:x:109:117::/nonexistent:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
```

```
ubuntu@ubuntu:virtual-machine:~$ sort -t: -k3 /etc/passwd
root:x:0:0:root:/root:/bin/bash
anisha:x:1000:1000:anisha,,,:/home/anisha:/bin/bash
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd:/usr/sbin/nologin
olivia:x:1001:1001::/home/olivia:/bin/sh
mary:x:1002:1003::/home/mary:/bin/bash
olive:x:1003:1004::/home/olive:/bin/sh
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
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
```

```
ubuntu@ubuntu:virtual-machine:~$ sort -t: -k3n /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
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
```

```
ubuntu@ubuntu:virtual-machine:~$ cut -d: -f1 /etc/passwd
root
daemon
bin
sys
sync
games
```