

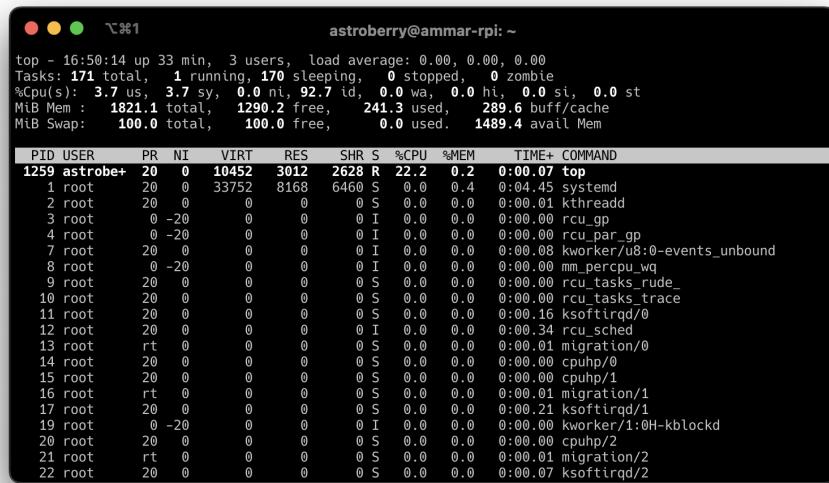
# Homework 1 - Operating Systems (ICS431)

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## 1 Linux Terminal

### 1.1 top

It shows live current running processes

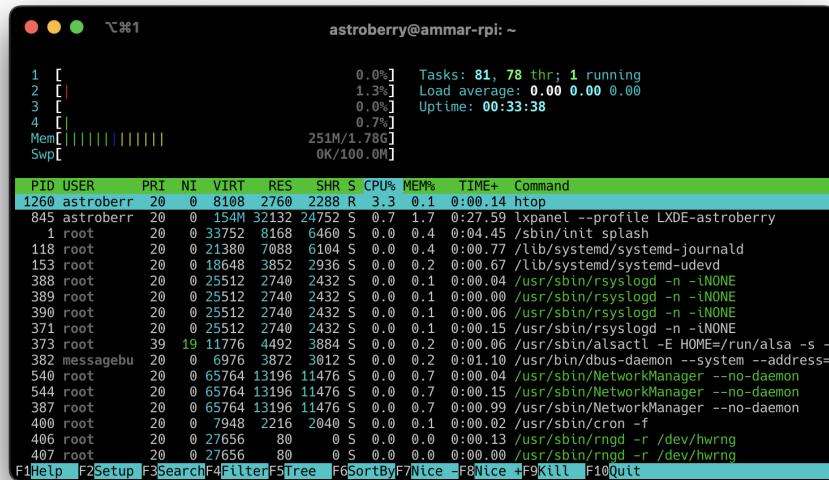


```
astroberry@ammarrpi: ~
top - 16:50:14 up 33 min, 3 users, load average: 0.00, 0.00, 0.00
Tasks: 171 total, 1 running, 170 sleeping, 0 stopped, 0 zombie
%Cpu(s): 3.7 us, 3.7 sy, 0.0 ni, 92.7 id, 0.0 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 1821.1 total, 1290.2 free, 241.3 used, 289.6 buff/cache
MiB Swap: 100.0 total, 100.0 free, 0.0 used. 1489.4 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
1259 astroberry+ 20 0 10452 3012 2628 R 22.2 0.2 0:00.07 top
 1 root 20 0 33752 8168 6460 S 0.0 0.4 0:04.45 systemd
 2 root 20 0 0 0 0 S 0.0 0.0 0:00.01 kthreadd
 3 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rCU_gop
 4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 rCU_par_gop
 7 root 20 0 0 0 0 I 0.0 0.0 0:00.08 kworker/u8:0-events_unbound
 8 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
 9 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rCU_tasks_rude_
10 root 20 0 0 0 0 S 0.0 0.0 0:00.00 rCU_tasks_trace_
11 root 20 0 0 0 0 S 0.0 0.0 0:00.16 ksoftirqd/0
12 root 20 0 0 0 0 I 0.0 0.0 0:00.34 rCU_sched
13 root rt 0 0 0 0 S 0.0 0.0 0:00.01 migration/0
14 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
15 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/1
16 root rt 0 0 0 0 S 0.0 0.0 0:00.01 migration/1
17 root 20 0 0 0 0 S 0.0 0.0 0:00.21 ksoftirqd/1
19 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/1:0H-kblockd
20 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/2
21 root rt 0 0 0 0 S 0.0 0.0 0:00.01 migration/2
22 root 20 0 0 0 0 S 0.0 0.0 0:00.07 ksoftirqd/2
```

### 1.2 htop

Similar to top but with very detailed info about the processes as well as the RAM and CPU usages

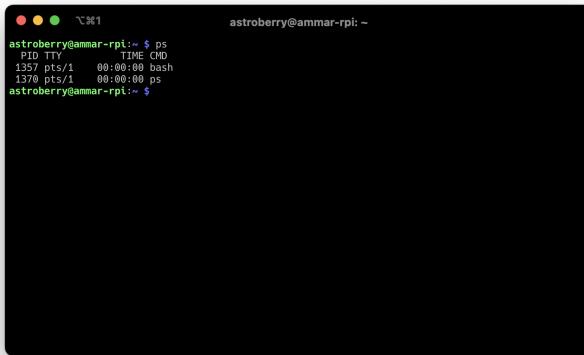


```
astroberry@ammarrpi: ~
Tasks: 81, 78 thr; 1 running
Load average: 0.00 0.00 0.00
Uptime: 00:33:38
Mem: 251M/1.78G
Swap: 0K/100.0M

PID USER PRI NI VIIRT RES SHR S CPU% MEM% TIME+ Command
1260 astroberry 20 0 8108 2760 2288 R 3.3 0.1 0:00.14 htop
845 astroberry 20 0 154M 32132 24752 S 0.7 1.7 0:27.59 lxpanel --profile LXDE-astroberry
 1 root 20 0 33752 8168 6460 S 0.0 0.4 0:04.45 /sbin/init splash
118 root 20 0 21380 7088 6104 S 0.0 0.4 0:00.77 /lib/systemd/systemd-journald
153 root 20 0 18648 3852 2936 S 0.0 0.2 0:00.67 /lib/systemd/systemd-udevd
388 root 20 0 25512 2740 2432 S 0.0 0.1 0:00.04 /usr/sbin/rsyslogd -n -lNONE
389 root 20 0 25512 2740 2432 S 0.0 0.1 0:00.00 /usr/sbin/rsyslogd -n -lNONE
390 root 20 0 25512 2740 2432 S 0.0 0.1 0:00.06 /usr/sbin/rsyslogd -n -lNONE
371 root 20 0 25512 2740 2432 S 0.0 0.1 0:00.15 /usr/sbin/rsyslogd -n -lNONE
373 root 39 19 11776 4492 3884 S 0.0 0.2 0:00.06 /usr/sbin/alsactl -E HOME=/run/alsa -s -
382 messagebus 20 0 6976 3872 3012 S 0.0 0.2 0:01.10 /usr/bin/dbus-daemon --system --address=
540 root 20 0 65764 13196 11476 S 0.0 0.7 0:00.04 /usr/sbin/NetworkManager --no-daemon
544 root 20 0 65764 13196 11476 S 0.0 0.7 0:00.15 /usr/sbin/NetworkManager --no-daemon
387 root 20 0 65764 13196 11476 S 0.0 0.7 0:00.99 /usr/sbin/NetworkManager --no-daemon
400 root 20 0 7948 2216 2040 S 0.0 0.1 0:00.02 /usr/sbin/cron -f
406 root 20 0 27656 80 0 S 0.0 0.0 0:00.13 /usr/sbin/rngd -r /dev/hwrng
407 root 20 0 27656 80 0 S 0.0 0.0 0:00.00 /usr/sbin/rngd -r /dev/hwrng
F1Help F2Setup F3Search F4Filter F5Tree F6SortByF7Nice F8Nice +F9Kill F10Quit
```

## 1.3 ps

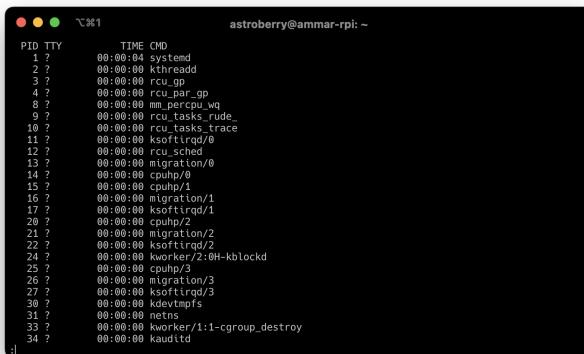
Show a set of the current running processes, with default parameters



```
astroberry@ammar-rpi:~ $ ps
PID TTY      TIME CMD
1 ?        00:00:00 systemd
2 ?        00:00:00 ksoftirqd
3 ?        00:00:00 rcu_opp
4 ?        00:00:00 rcu_par_opp
8 ?        00:00:00 mm_percpu_wq
9 ?        00:00:00 rcu_tasks_rude_
10 ?       00:00:00 rcu_tasks_trace_
11 ?       00:00:00 rcu_sched_wq/0
12 ?       00:00:00 rcu_sched
13 ?       00:00:00 migration/0
14 ?       00:00:00 cpuhp/0
15 ?       00:00:00 cpuhp/1
16 ?       00:00:00 migration/1
17 ?       00:00:00 migration/1
20 ?       00:00:00 cpuhp/2
21 ?       00:00:00 migration/2
22 ?       00:00:00 ksoftirqd/2
24 ?       00:00:00 kworker/2:0H-kblockd
25 ?       00:00:00 cpuhp/3
26 ?       00:00:00 migration/3
27 ?       00:00:00 ksoftirqd/3
30 ?       00:00:00 kdevtmpfs
31 ?       00:00:00 netns
33 ?       00:00:00 kworker/1:1-cgroup_destroy
34 ?       00:00:00 kaudited
```

## 1.4 ps -A | less

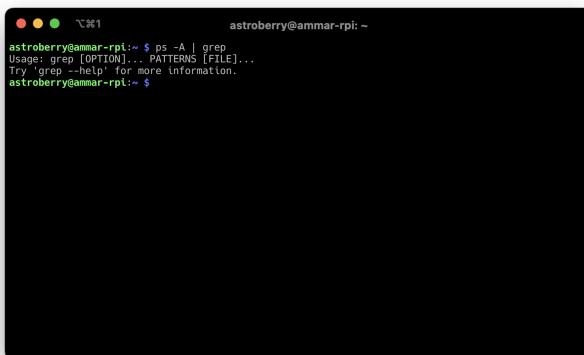
**ps -A** shows all processes, the pipe operator (**|**) will redirect stdout of the left command into the stdin of the right command. Here **less** command shows the output as scrollable list.



```
astroberry@ammar-rpi:~ $ ps -A | less
PID TTY      TIME CMD
1 ?        00:00:00 systemd
2 ?        00:00:00 ksoftirqd
3 ?        00:00:00 rcu_opp
4 ?        00:00:00 rcu_par_opp
8 ?        00:00:00 mm_percpu_wq
9 ?        00:00:00 rcu_tasks_rude_
10 ?       00:00:00 rcu_tasks_trace_
11 ?       00:00:00 rcu_sched_wq/0
12 ?       00:00:00 rcu_sched
13 ?       00:00:00 migration/0
14 ?       00:00:00 cpuhp/0
15 ?       00:00:00 cpuhp/1
16 ?       00:00:00 migration/1
17 ?       00:00:00 migration/1
20 ?       00:00:00 cpuhp/2
21 ?       00:00:00 migration/2
22 ?       00:00:00 ksoftirqd/2
24 ?       00:00:00 kworker/2:0H-kblockd
25 ?       00:00:00 cpuhp/3
26 ?       00:00:00 migration/3
27 ?       00:00:00 ksoftirqd/3
30 ?       00:00:00 kdevtmpfs
31 ?       00:00:00 netns
33 ?       00:00:00 kworker/1:1-cgroup_destroy
34 ?       00:00:00 kaudited
```

## 1.5 ps -A | grep

As above but it use command **grep** for filtering



```
astroberry@ammar-rpi:~ $ ps -A | grep
Usage: grep [OPTION]... PATTERN [FILE]...
Try 'grep --help' for more information.
astroberry@ammar-rpi:~ $
```

## 1.6 pstree

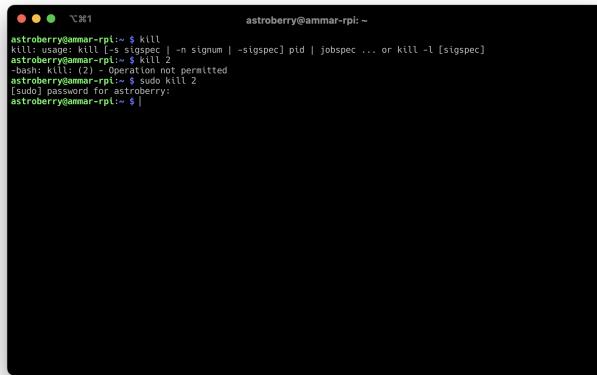
Like `ps`, but in tree-like format.



```
astroberry@ammar-rpi:~ $ pstree
systemd---NetworkManager---dhclient
systemd---NetworkManager---dnsmasq
systemd---NetworkManager---2*[{NetworkManager}]
alsactl
apglibd.py
avahi-daemon
bluealsa---2*[{bluealsa}]
bluetoothd
chrony---chronyd
cups
cups-browsed---2*[{cups-browsed}]
cupsd
dhcpcd
gpsd
hciaattach
lightdm---Xorg---9*[{Xorg}]
    lightdm---lxsession---lxpanel---3*[{lxpanel}]
        lxpolkit---2*[{lxpolkit}]
        openbox
        pcmanfm---2*[{pcmanfm}]
        ssh-agent
        2*[{lxsession}]
    2*[{lightdm}]
    login---bash
    menu-cached---2*[{menu-cached}]
    nginx---4*[nginx]
    nm-applet---1*[{nm-applet}]
    nmbd
    polkitd---2*[{polkitd}]
    -2*[{python3}]
```

## 1.7 kill

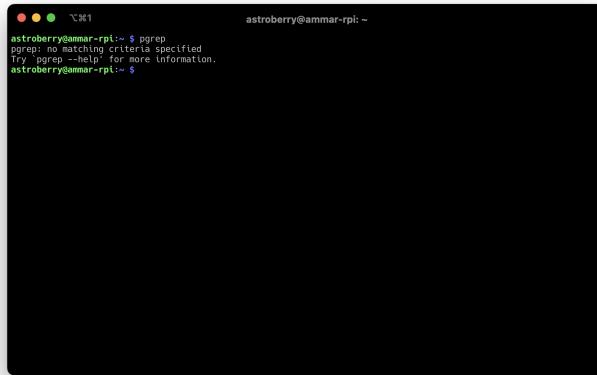
Like `ps`, but in tree-like format.



```
astroberry@ammar-rpi:~ $ kill
kill: usage: kill [-s sigspec | -n signum | -sigspec] pid | jobspec ... or kill -l [sigspec]
astroberry@ammar-rpi:~ $ kill 2
-bash: kill: (2) - Operation not permitted
astroberry@ammar-rpi:~ $ sudo kill 2
[sudo] password for astroberry:
astroberry@ammar-rpi:~ $
```

## 1.8 pgrep

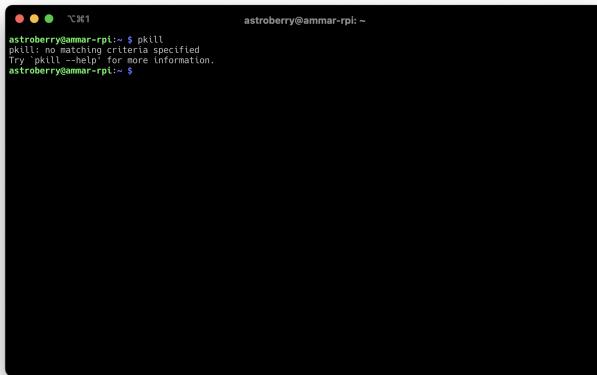
Like `ps`, but in tree-like format.



```
astroberry@ammar-rpi:~ $ pgrep
pgrep: no matching criteria specified
Try 'pgrep --help' for more information.
astroberry@ammar-rpi:~ $
```

## 1.9 pkill

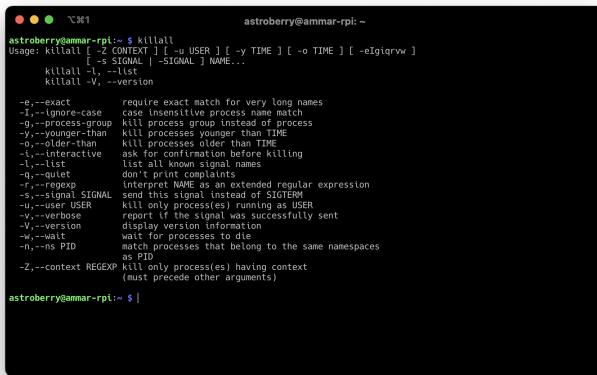
Using power of filtering in **grep**, and perform **kill** for all matched pattern.



```
astroberry@ammar-rpi:~ $ pkill
pkill: no matching criteria specified
Try 'pkill --help' for more information.
astroberry@ammar-rpi:~ $
```

## 1.10 killall

Send a kill signal to all processes by command name.



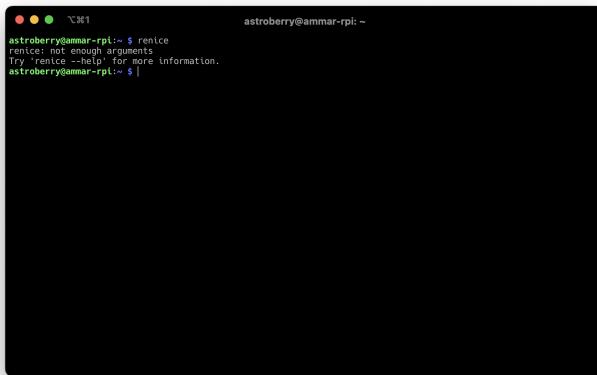
```
astroberry@ammar-rpi:~ $ killall
Usage: killall [-Z CONTEXT] [-u USER] [-y TIME] [-o TIME] [-eIgiqrsv]
           [-s SIGNAL | -SIGNAL] NAME...
           killall -l, --list
           killall -V, --version

--exact          require exact match for very long names
-l, --longcase  match case of the process name
-s, --process-group kill process group instead of process
-y, --younger-than kill processes younger than TIME
-o, --older-than  kill processes older than TIME
-e, --exact-active  ask for confirmation before killing
-i, --interactive  ask for confirmation before killing
-l, --list        list all known signal names
-q, --quiet       don't print complaints
-r, --regexp      interpret NAME as an extended regular expression
-S, --signal      send the signal named SIGNAL
-u, --user USER   kill only processes (running as USER)
-v, --verbose     report if the signal was successfully sent
-V, --version     display version information
--ns PID         match processes that belong to the same namespaces
-as PID          match processes as PID
-z, --context REGEXP kill only process(es) having context
                  (must precede other arguments)

astroberry@ammar-rpi:~ $ |
```

## 1.11 pstree

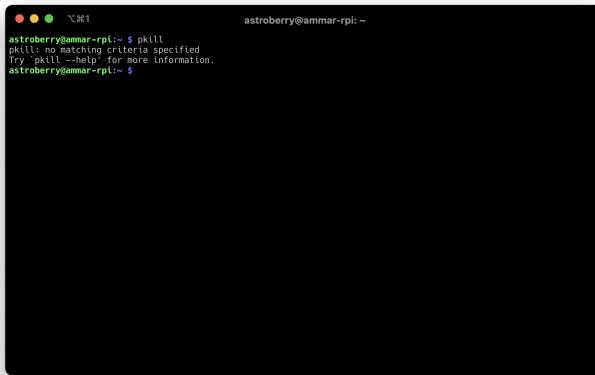
Change the priority value of running processes.



```
astroberry@ammar-rpi:~ $ renice
renice: not enough arguments
Try 'renice --help' for more information.
astroberry@ammar-rpi:~ $ |
```

## 1.12 xkill

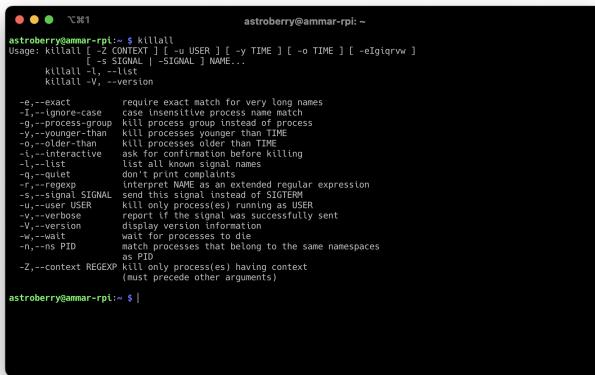
forcing the X server to close connections to clients.



```
astroberry@ammar-rpi:~ $ xkill
astroberry@ammar-rpi:~ $ pkill
pkill: no matching criteria specified
Try 'pkill --help' for more information.
astroberry@ammar-rpi:~ $
```

## 1.13 nohup

To run a command that cannot be affected by hangup singal.



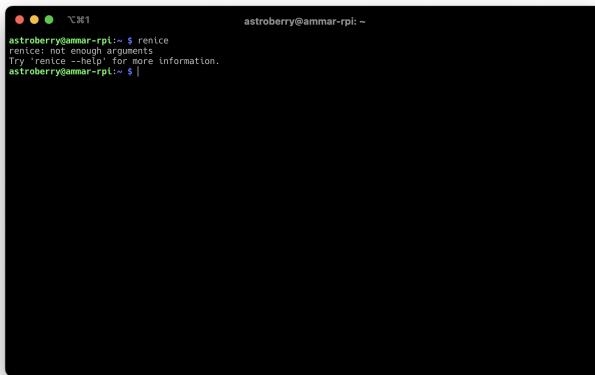
```
astroberry@ammar-rpi:~ $ killall
Usage: killall [-Z CONTEXT] [-u USER] [-y TIME] [-o TIME] [-eIgiqrsv]
           [-s SIGNAL | -SIGNAL] NAME...
           killall -l, --list
           killall -v, --version

--exact          require exact match for very long names
-l, --longcase  match case of the process name
-s, --process-group kill process group instead of process
-y, --younger-than kill processes younger than TIME
-o, --older-than  kill processes older than TIME
-e, --exact-active  ask for confirmation before killing
-i, --interactive  ask for confirmation before killing
-l, --list        list all known signal names
-q, --quiet       don't print complaints
-r, --regexp      interpret NAME as an extended regular expression
-S, --signal      send the specified signal (SIGTERM)
-u, --user USER   kill only processes (running as USER)
-v, --verbose     report if the signal was successfully sent
-V, --version     display version information
--ns PID         match processes that belong to the same namespaces
-as PID          match processes as PID
-Z, --context REGEXP kill only process(es) having context
                  (must precede other arguments)

astroberry@ammar-rpi:~ $ |
```

## 1.14 ls

List all the current working directory contents.



```
astroberry@ammar-rpi:~ $ renice
renice: not enough arguments
Try 'renice --help' for more information.
astroberry@ammar-rpi:~ $ |
```

## 1.15 ls -R

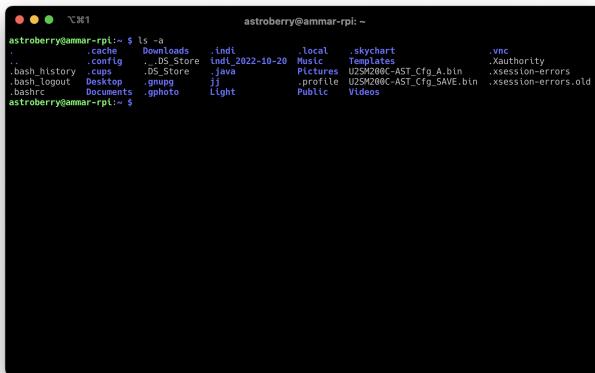
forcing the X server to close connections to clients.



```
astroberry@amar-OptiPlex-5090:~ $ ls -R
.
├── Desktop
├── Downloads
├── indl_2022-10-20
├── jj
├── Light
├── Music
├── Public
├── U2SM200C-AST_Cfg_A.bin
└── Videos
.
├── .Desktop:
├── .Documents:
├── .Downloads:
├── .indl_2022-10-20:
├── indl_record_2022-10-20@21-42-54.ser
.
├── .jj:
├── .Light:
├── .Music:
├── .Pictures:
├── .Public:
├── .Templates:
└── .Videos:
astroberry@amar-OptiPlex-5090:~ $ |
```

## 1.16 ls -a

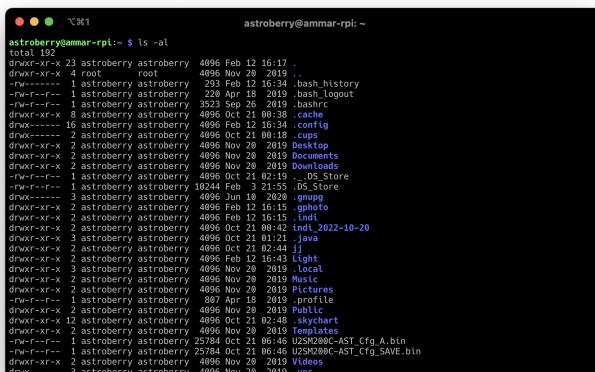
Do not ignore contents with name starting with dot (.example).



```
astroberry@amar-OptiPlex-5090:~ $ ls -a
.
├── .cache
├── .config
├── .DS_Store
├── .indl_2022-10-20
├── .local
├── .skychart
└── .vnc
..
├── .bash_history
├── .cups
├── .DS_Store
├── .java
├── .Pictures
├── .U2SM200C-AST_Cfg_A.bin
└── .xsession-errors
.
├── .bash_logout
├── .bashrc
├── .profile
├── .U2SM200C-AST_Cfg_SAVE.bin
└── .xsession-errors.old
.
├── .bashrc
├── .Documents
├── .gphoto
├── .Light
├── .Public
└── .Videos
astroberry@amar-OptiPlex-5090:~ $ |
```

## 1.17 ls -al

In recursive mode, meaning list all sub directories



```
astroberry@amar-OptiPlex-5090:~ $ ls -al
total 192
drwxr-xr-x 23 astroberry astroberry 4096 Feb 12 16:17 .
drwxr-xr-x  4 root      root      4096 Nov 20 2019 ..
-rw-r--r--  1 astroberry astroberry 293 Feb 12 16:34 .bash_history
-rw-r--r--  1 astroberry astroberry 228 Apr 18 2019 .bash_logout
-rw-r--r--  1 astroberry astroberry 1024 Feb 12 16:34 .bashrc
drwxr-xr-x  8 astroberry astroberry 4096 Oct 21 08:38 .cache
drwxr-xr-x 16 astroberry astroberry 4096 Feb 12 16:34 .config
drwxr-xr-x  2 astroberry astroberry 4096 Oct 21 08:18 .cups
drwxr-xr-x  2 astroberry astroberry 4096 Oct 21 08:18 .DS_Store
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Documents
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 Downloads
drwxr-xr-x  1 astroberry astroberry 4096 Oct 21 02:19 .DS_Store
drwxr-xr-x  1 astroberry astroberry 10244 Nov 20 2019 .DS_Store
drwxr-xr-x  3 astroberry astroberry 4096 Jun 10 2020 .gnupg
drwxr-xr-x  2 astroberry astroberry 4096 Feb 12 16:15 .gphoto
drwxr-xr-x  2 astroberry astroberry 4096 Oct 21 08:42 .indl_2022-10-20
drwxr-xr-x  3 astroberry astroberry 4096 Oct 21 01:21 .java
drwxr-xr-x  2 astroberry astroberry 4096 Oct 21 02:44 .jj
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Light
drwxr-xr-x  3 astroberry astroberry 4096 Nov 20 2019 .local
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Music
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Pictures
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Public
drwxr-xr-x 12 astroberry astroberry 4096 Oct 21 02:48 .skychart
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Templates
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .U2SM200C-AST_Cfg_A.bin
-rw-r--r--  1 astroberry astroberry 25784 Oct 21 06:46 .U2SM200C-AST_Cfg_SAVE.bin
drwxr-xr-x  2 astroberry astroberry 4096 Nov 20 2019 .Videos
drwxr-xr-x  3 astroberry astroberry 4096 Nov 20 2019 .vnc
astroberry@amar-OptiPlex-5090:~ $ |
```

### 1.18 cat > filename

Create a file with the name `filename`, and anything typed in terminal will be part of the file until termination by Ctrl+X.



```
astroberry@ammar-rpi:~ $ cat > filename
hello
world
astroberry@ammar-rpi:~ $
```

### 1.19 cat filename

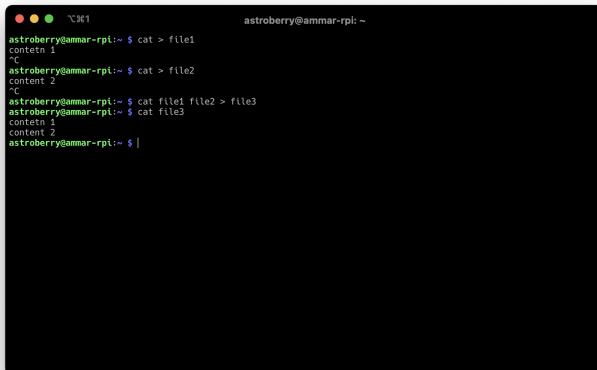
Prints a file named `filename` to the stdout.



```
astroberry@ammar-rpi:~ $ cat filename
hello
world
astroberry@ammar-rpi:~ $
```

### 1.20 cat file1 file2 > file3

Take content of both `file1` `file2` into new file named `file3`



```
astroberry@ammar-rpi:~ $ cat > file1
content 1
^C
astroberry@ammar-rpi:~ $ cat > file2
content 2
^C
astroberry@ammar-rpi:~ $ cat file1 file2 > file3
astroberry@ammar-rpi:~ $ cat file3
content 1
content 2
astroberry@ammar-rpi:~ $ |
```

## 1.21 mv file new/file/path'

It can be used to move file to another dir, if it's the same dir, it rename the file.

```
● ● ●  ~%1      astroberry@ammar-rpi: ~
astroberry@ammar-rpi:~ $ mv file1 Downloads/
astroberry@ammar-rpi:~ $ |
```

## 1.22 mv filename new\_file\_name

Moved the file to the same directory, meaning it got renamed.

```
● ● ●  ~%1      astroberry@ammar-rpi: ~
astroberry@ammar-rpi:~ $ mv filename new_name
astroberry@ammar-rpi:~ $ ls
Desktop  file3      Music    Templates
Documents  indi_2022-10-20  new_name  U2SM200C-AST_Cfg_A.bin
Downloads  jj        Pictures  U2SM200C-AST_Cfg_SAVE.bin
file2      Light      Public   Videos
astroberry@ammar-rpi:~ $ |
```

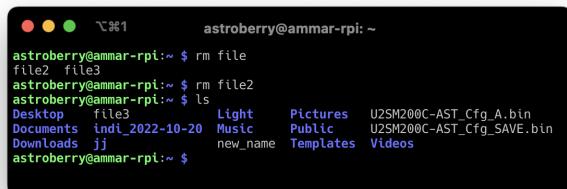
## 1.23 sudo

Super user do; run a command in the root user permission.

```
● ● ●  ~%1      astroberry@ammar-rpi: ~
astroberry@ammar-rpi:~ $ sudo ls
[sudo] password for astroberry:
Desktop  file3      Music    Templates
Documents  indi_2022-10-20  new_name  U2SM200C-AST_Cfg_A.bin
Downloads  jj        Pictures  U2SM200C-AST_Cfg_SAVE.bin
file2      Light      Public   Videos
astroberry@ammar-rpi:~ $ |
```

## 1.24 rm filename

Remove the file name `filename` from existence.



```
astroberry@ammar-rpi:~$ rm file
file2 file3
astroberry@ammar-rpi:~$ rm file2
astroberry@ammar-rpi:~$ ls
Desktop  file3  Light  Pictures  U2SM200C-AST_Cfg_A.bin
Documents  lndl_2022-10-20  Music  Public  U2SM200C-AST_Cfg_SAVE.bin
Downloads  jj  new_name  Templates  Videos
astroberry@ammar-rpi:~$
```

## 1.25 man ls

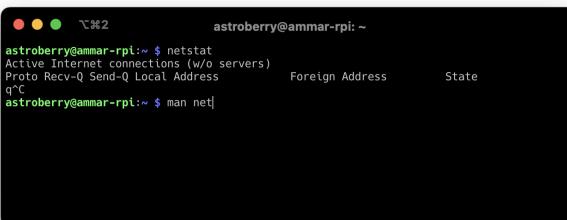
Print the manual page for the command `ls`.



```
astroberry@ammar-rpi:~$ man ls
astroberry@ammar-rpi:~$ |
```

## 1.26 netstat

Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships



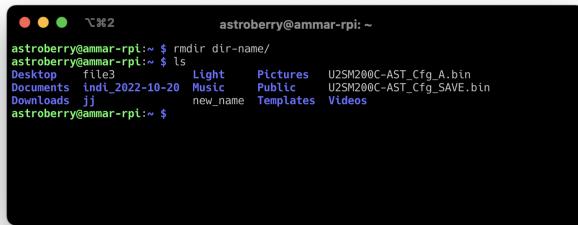
```
astroberry@ammar-rpi:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address          Foreign Address      State
astroberry@ammar-rpi:~$ man net|
```

## 1.27 clear

Clear all outputs

## 1.28 mkdir dir-name

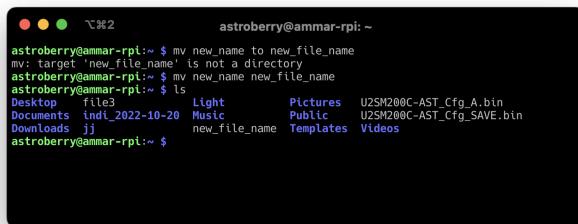
Create a new directory



```
astroberry@ammar-rpi:~ $ rmdir dir-name/
astroberry@ammar-rpi:~ $ ls
Desktop  file3  Light  Pictures  U2SM200C-AST_Cfg_A.bin
Documents  indi_2022-10-20  Music  Public  U2SM200C-AST_Cfg_SAVE.bin
Downloads  jj  new_name  Templates  Videos
astroberry@ammar-rpi:~ $
```

## 1.29 mv old\_file new\_file

We knew the `mv` moves file from a path to a new one, but if it's on the same path, it's like renaming the file.



```
astroberry@ammar-rpi:~ $ mv new_name to new_file_name
mv: target 'new_file_name' is not a directory
astroberry@ammar-rpi:~ $ mv new_name new_file_name
astroberry@ammar-rpi:~ $ ls
Desktop  file3  Light  Pictures  U2SM200C-AST_Cfg_A.bin
Documents  indi_2022-10-20  Music  Public  U2SM200C-AST_Cfg_SAVE.bin
Downloads  jj  new_file_name  Templates  Videos
astroberry@ammar-rpi:~ $
```

## 1.30 pr -x

This is not a valid argument.

## 1.31 pr -h

It helps to prepare file for printing it, the option `-h` is used to a centered HEADER instead of filename in page header.



```
astroberry@ammar-rpi:~ $ pr -h file3
2023-02-17 00:02          file3          Page 1
```

### 1.32 pr -n

Same as above, but adds line numbering.

```
● ○ ●  ~%2 astroberry@ammar-rpi: ~
astroberry@ammar-rpi:~ $ pr -n file3
2023-02-16 16:11          file3          Page 1
1  content 1
2  content 2
```

### 1.33 vmstat

It reports information about processes, memory, paging, block IO, traps, disks and cpu activity.

```
● ○ ●  ~%2 astroberry@ammar-rpi: ~
astroberry@ammar-rpi:~ $ vmstat
procs -----memory----- swap-- io---- system-- cpu-----
r b swpd free buff cache si so bi bo in cs us sy id wa st
0 0      0 1300832 51284 264320 0 0 2 0 14 21 0 0 99 0 0
astroberry@ammar-rpi:~ $ |
```

### 1.34 df

It reports file system disk space usage

```
● ○ ●  ~%2 astroberry@ammar-rpi: ~
astroberry@ammar-rpi:~ $ df
Filesystem 1K-blocks Used Available Use% Mounted on
/dev/root 14625832 6433176 7802416 46% /
devtmpfs 898624 0 898624 0% /dev
tmpfs 932416 0 932416 0% /dev/shm
tmpfs 932416 9776 922640 2% /run
tmpfs 5120 4 5116 1% /run/lock
tmpfs 932416 0 932416 0% /sys/fs/cgroup
/dev/mmcblk0p1 258095 50486 207610 20% /boot
tmpfs 186480 8 186472 1% /run/user/1001
astroberry@ammar-rpi:~ $ |
```

### 1.35 vi filename

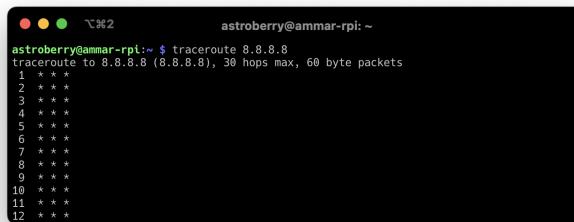
Command for the vim editor. It opens the file called `filename` or creates it.



```
astroberry@ammar-rpi: ~
hello world
~
~
```

### 1.36 traceroute

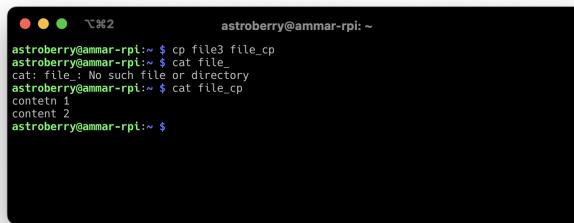
tracks the route packets taken from an IP network on their way to a given host.



```
astroberry@ammar-rpi: ~ $ traceroute 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
1 * *
2 * *
3 * *
4 * *
5 * *
6 * *
7 * *
8 * *
9 * *
10 * *
11 * *
12 * *
```

### 1.37 cp file new\_file

It copies a content of file file to a new one called `new_file`.



```
astroberry@ammar-rpi: ~ $ cp file3 file_cp
astroberry@ammar-rpi: ~ $ cat file
cat: file : No such file or directory
astroberry@ammar-rpi: ~ $ cat file_cp
content 1
content 2
astroberry@ammar-rpi: ~ $
```

### 1.38 mv dir new\_dir

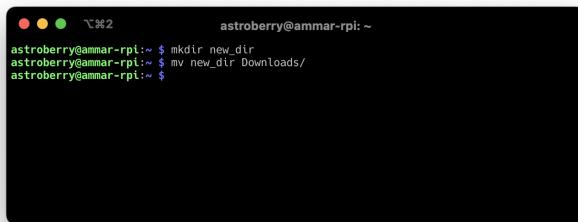
It moves directories into another one.



```
astroberry@ammar-rpi:~$ pr -n file3
2023-02-16 16:11           file3          Page 1
1  content 1
2  content 2
```

### 1.39 history

It shows previous executed commands.



```
astroberry@ammar-rpi:~$ mkdir new_dir
astroberry@ammar-rpi:~$ mv new_dir Downloads/
astroberry@ammar-rpi:~$
```