

PS (process status)

pid - unique process id

tty - terminal type

time - total time of process

cmd - runned commands

```
sathish@dark:~$ ps
```

PID	TTY	TIME	CMD
2016	pts/0	00:00:00	bash
5307	pts/0	00:00:00	ps

ps a (list all process in terminal)

```
sathish@dark:~$ ps a
```

PID	TTY	STAT	TIME	COMMAND
1396	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1410	tty2	Sl+	0:00	/usr/libexec/gnome-session-binary --session=ubuntu
3935	pts/0	Ss	0:00	bash
5466	pts/0	R+	0:00	ps

```
sathish@dark:~$ ps -a ( except leaders STAT s )
```

PID	TTY	TIME	CMD
1410	tty2	00:00:00	gnome-session-b
5427	pts/0	00:00:00	ps

ps -A or ps -e (list all process on linux)

```
sathish@dark:~$ ps -A
```

1 ?	00:00:02	systemd
2 ?	00:00:00	kthreadd
3 ?	00:00:00	rcu_gp
4 ?	00:00:00	rcu_par_gp
5 ?	00:00:00	netns
7 ?	00:00:00	kworker/0:0H-events_highpri

```
10 ?          00:00:00 mm_percpu_wq
```

ps x (list all process of current user)

```
sathish@dark:~$ ps x
```

PID	TTY	STAT	TIME	COMMAND
1348	?	Ss	0:01	/lib/systemd/systemd --user
1349	?	S	0:00	(sd-pam)
1355	?	S<sl	0:00	/usr/bin/pipewire
1356	?	Ssl	0:00	/usr/bin/pipewire-media-session
1357	?	S<sl	0:00	/usr/bin/pulseaudio --daemonize=no --log-target=
1358	?	Ss	0:00	/snap/snapd-desktop-integration/49/usr/bin/snapd
1366	?	Ss	0:01	/usr/bin/dbus-daemon --session --address=systemd
1372	?	Ssl	0:00	/usr/libexec/gvfsd

ps ax (list all process in BSD format)

```
sathish@dark:~$ ps ax
```

PID	TTY	STAT	TIME	COMMAND
1	?	Ss	0:02	/sbin/init splash
2	?	S	0:00	[kthreadd]
3	?	I<	0:00	[rcu_gp]
4	?	I<	0:00	[rcu_par_gp]
5	?	I<	0:00	[netns]
7	?	I<	0:00	[kworker/0:0H-events_highpri]
10	?	I<	0:00	[mm_percpu_wq]
11	?	S	0:00	[rcu_tasks_rude_]

....

ps -f (list process in full format)

ps -F (list process in extra full format)

```
sathish@dark:~$ ps -f
```

UID	PID	PPID	C	STIME	TTY	TIME	CMD
sathish	3935	3913	0	21:43	pts/0	00:00:00	bash

```
sathish      6008      3935  0 22:55 pts/0      00:00:00 ps -f
```

```
sathish@dark:~$ ps -F
```

UID	PID	PPID	C	SZ	RSS	PSR	STIME	TTY	TIME	CMD
sathish	3935	3913	0	4947	2496	0	21:43	pts/0	00:00:00	bash
sathish	6009	3935	0	5331	1580	0	22:55	pts/0	00:00:00	ps -F

ps u (show process with username)

```
sathish@dark:~$ ps u
```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
sathish	1378	0.0	0.2	171036	4896	tty2	Ssl+	08:55	0:00	/usr/libexec/
sathish	1382	0.0	0.5	231688	11024	tty2	Sl+	08:55	0:00	/usr/libexec/
sathish	1975	0.0	0.1	19660	3544	pts/0	Ss	08:56	0:00	bash
sathish	3866	0.0	0.1	21324	3384	pts/0	R+	08:59	0:00	ps u

```
sathish@dark:~$
```

ps v (show process with virtual memory format)

```
sathish@dark:~$ ps v
```

PID	TTY	STAT	TIME	MAJFL	TRS	DRS	RSS	%MEM	COMMAND
1378	tty2	Ssl+	0:00	0	17	171018	2624	0.1	/usr/libexec/gdm-wayl
1382	tty2	Sl+	0:00	2	139	231548	5972	0.2	/usr/libexec/gnome-se
1975	pts/0	Ss	0:00	25	891	18768	3132	0.1	bash
4311	pts/0	R+	0:00	0	50	21273	1512	0.0	ps v

```
sathish@dark:~$
```

ps -u or ps -user (show process of given username)

```
sathish@dark:~$ ps -u root
```

PID	TTY	TIME	CMD
1	?	00:00:01	systemd
2	?	00:00:00	kthreadd
3	?	00:00:00	rcu_gp
4	?	00:00:00	rcu_par_gp

```

5 ?      00:00:00 netns
6 ?      00:00:00 kworker/0:0-events
.....

```

ps p pid or ps -pid or ps --pid pid (list process of given process id)

```
sathish@dark:~$ ps p 1,2
```

PID	TTY	STAT	TIME	COMMAND
1 ?		Ss	0:01	/sbin/init splash
2 ?		S	0:00	[kthreadd]

```
sathish@dark:~$ ps -p 1,2
```

PID	TTY	TIME	CMD
1 ?		00:00:01	systemd
2 ?		00:00:00	kthreadd

```
sathish@dark:~$ ps --pid 1,2
```

PID	TTY	TIME	CMD
1 ?		00:00:01	systemd
2 ?		00:00:00	kthreadd

ps e (show environment after command)

```
sathish@dark:~$ ps e
```

PID	TTY	STAT	TIME	COMMAND
1378	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1382	tty2	Sl+	0:00	/usr/libexec/gnome-session-binary --session=ubuntu
1975	pts/0	Ss	0:00	bash SYSTEMD_EXEC_PID=1462 SSH_AUTH_SOCK=/run/user/
4566	pts/0	R+	0:00	ps e SHELL=/bin/bash SESSION_MANAGER=local/dark:@/t

```
sathish@dark:~$
```

ps h (hide header of top row)sathish@dark:~\$ ps h

1378	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1382	tty2	Sl+	0:00	/usr/libexec/gnome-session-binary --session=ubuntu
1975	pts/0	Ss	0:00	bash
4581	pts/0	R+	0:00	ps h

ps f or ps --forest (display tree fromat)

sathish@dark:~\$ ps f

PID	TTY	STAT	TIME	COMMAND
1975	pts/0	Ss	0:00	bash
4612	pts/0	R+	0:00	_ ps f
1378	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1382	tty2	Sl+	0:00	_ /usr/libexec/gnome-session-binary --session=ubu

sathish@dark:~\$

ps H (show threads)

sathish@dark:~\$ ps H

PID	TTY	STAT	TIME	COMMAND
1378	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1378	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1378	tty2	Ssl+	0:00	/usr/libexec/gdm-wayland-session env GNOME_SHELL_SE
1382	tty2	Sl+	0:00	/usr/libexec/gnome-session-binary --session=ubuntu
1382	tty2	Sl+	0:00	/usr/libexec/gnome-session-binary --session=ubuntu
1382	tty2	Sl+	0:00	/usr/libexec/gnome-session-binary --session=ubuntu
1975	pts/0	Ss	0:00	bash
4670	pts/0	R+	0:00	ps H

ps L (show all format specifiers)

sathish@dark:~\$ ps L

%cpu	%CPU
%mem	%MEM
_left	LLLLLLLLL
_left2	L2L2L2L2
_right	RRRRRRRRR
_right2	R2R2R2R2
_unlimited	U
_unlimited2	U2
alarm	ALARM

args	COMMAND
atime	TIME
blocked	BLOCKED
bsdstart	START

ps s (display process in signal format)

sathish@dark:~\$ ps s

UID	PID	PENDING	BLOCKED	IGNORED	CAUGHT	STAT	TTY	TIME
COMMAND								
1000	1378	00000000	00000000	00001000	<00014000	Ssl+	tty2	0:00 /usr/
1000	1382	00000000	00000000	00001000	<00004002	Sl+	tty2	0:00 /usr/
1000	1975	00000000	00010000	00384004	4b813efb	Ss	pts/0	0:00 bash
1000	4734	00000000	00000000	00000000	73d1fef9	R+	pts/0	0:00 ps s

sathish@dark:~\$

ps -M (Display security info)

sathish@dark:~\$ ps -M

LABEL	PID	TTY	TIME	CMD
unconfined	1975	pts/0	00:00:00	bash
unconfined	4763	pts/0	00:00:00	ps

sathish@dark:~\$

htop

The screenshot shows a terminal window titled 'sathish@dark: ~'. At the top, system statistics are displayed: 0% CPU, 1.3% Tasks: 155, 910 thr; 1 running, 1.4% Load average: 1.51 1.75 1.30, Mem[] 1.44G/1.93G, Uptime: 00:45:37, and Swp[] 927M/2.62G. Below this is a table of running processes with columns: PID, USER, PRI, NI, VIRT, RES, SHR, S, CPU%, MEM%, TIME+, and Command. The table lists various system processes like systemd-journald, systemd-udevd, systemd-oond, systemd-resolved, systemd-timesyncd, and user processes like gnome-shell, htop, and firefox. At the bottom, there is a keyboard shortcut legend: F1=help, F2=Setup, F3=Search, F4=Filter, F5=Tree, F6=SortBy, F7=Nice, F8=Nice +, F9=Kill, F10=Quit.

nmon (ngel's monitor)

nmon is a moimttor linux system and network performace

sathish@dark:~\$ sudo apt-get install nmon

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

The following NEW packages will be installed:

nmon

0 upgraded, 1 newly installed, 0 to remove and 264 not upgraded.

Need to get 69.3 kB of archives.

After this operation, 177 kB of additional disk space will be used.

Get:1 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 nmon amd64

16n+debian-1 [69.3 kB]

Fetched 69.3 kB in 1s (50.9 kB/s)

Selecting previously unselected package nmon.

(Reading database ... 160089 files and directories currently installed.)

Preparing to unpack .../nmon_16n+debian-1_amd64.deb ...

Unpacking nmon (16n+debian-1) ...

Setting up nmon (16n+debian-1) ...

Processing triggers for man-db (2.10.2-1) ...

start nmon

sathish@dark:~\$ nmon

```
nmon-16n [H for help] Hostname=dark Refresh= 2secs 10:35.04

      _____
     |nmon|
     |_____|

For help type H or ...
nmon -? - hint
nmon -h - full details

To stop nmon type q to Quit

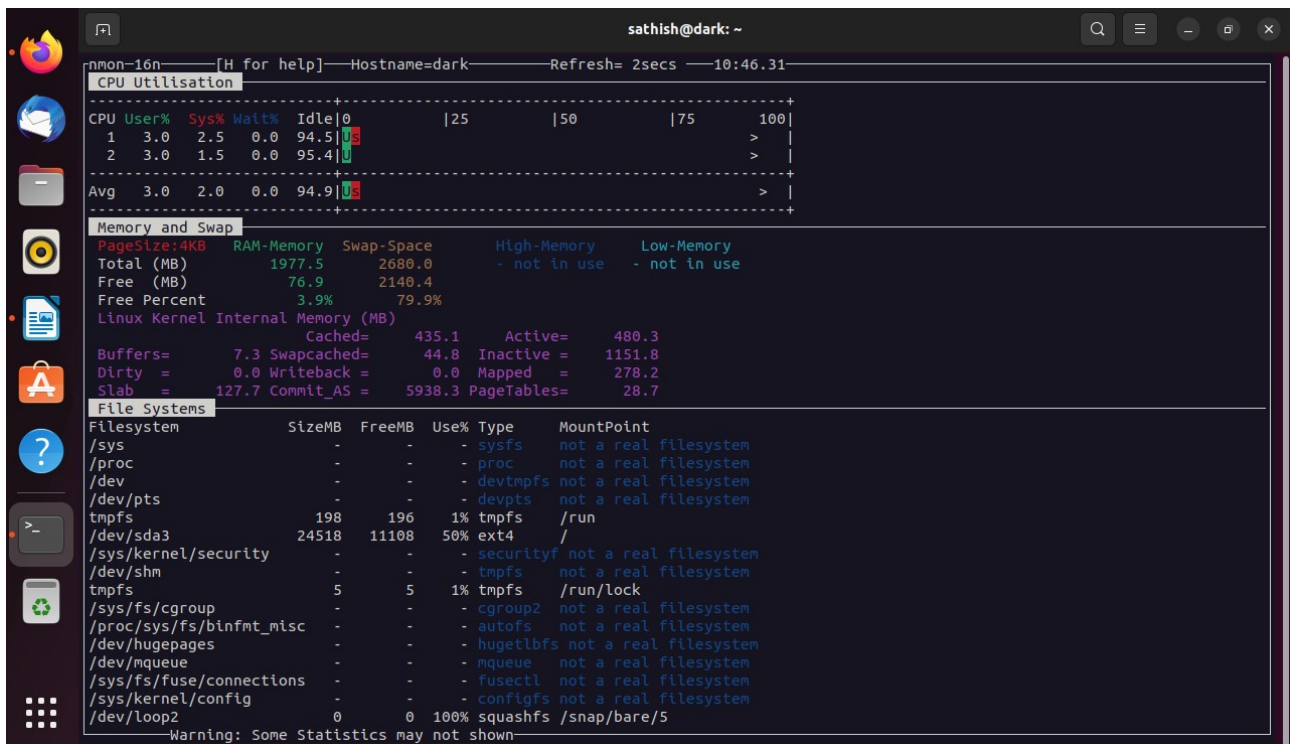
Use these keys to toggle statistics on/off:
c = CPU          l = CPU Long-term      - = Faster screen updates
C = " WideView  U = Utilisation          + = Slower screen updates
m = Memory       V = Virtual memory      j = File Systems
d = Disks        n = Network              . = only busy disks/procs
r = Resource     N = NFS                  h = more options
k = Kernel       t = Top-processes       q = Quit
```

```
nmon-16n Hostname=dark Refresh= 3secs 10:37.04
HELP: Hit h to remove this Info Hit q to Quit

Letters which toggle on/off statistics:
h = This help          | r = Resources OS & Proc
c = CPU Util  C = wide view | l = longer term CPU averages
m = Memory & Swap  L=Huge   | V = Virtual Memory
n = Network         | N = NFS
d = Disk I/O Graphs D=Stats | o = Disks %Busy Map
k = Kernel stats & loadavg | j = Filesystem Usage J=reduced
M = MHz by thread & CPU
t = TopProcess 1=Priority/Nice/State | u = TopProc with command line
ReOrder by: 3=CPU 4=RAM 5=I/O      | Hit u twice to update
g = User Defined Disk Groups      | G = with -g switches Disk graphs
[start nmon with -g <filename>]    | to disk groups only
                                   | b = black & white mode

Other Controls:
+ = double the screen refresh time | 0 = reset peak marks (>) to zero
- = half the screen refresh time   | space refresh screen now
. = Display only busy disks & CPU   | q = Quit

(C) Copyright 2009 Nigel Griffiths | See http://nmon.sourceforge.net
Colour: #0# #1# #2# #3# #4# #5# #6# #7# #8# #9# #10# #11# #12#
```

df (disk filesystem)

find total disk space and available space

sathish@dark:~\$ df

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
tmpfs	202496	1540	200956	1%	/run
/dev/sda3	25106692	12446740	11359268	53%	/
tmpfs	1012472	0	1012472	0%	/dev/shm
tmpfs	5120	4	5116	1%	/run/lock
/dev/sda2	524252	5364	518888	2%	/boot/efi
tmpfs	202492	2416	200076	2%	/run/user/1000

human readable

sathish@dark:~\$ df -h

Filesystem	Size	Used	Avail	Use%	Mounted on
tmpfs	198M	1.6M	197M	1%	/run
/dev/sda3	24G	12G	11G	53%	/
tmpfs	989M	0	989M	0%	/dev/shm

tmpfs	5.0M	4.0K	5.0M	1%	/run/lock
/dev/sda2	512M	5.3M	507M	2%	/boot/efi
tmpfs	198M	2.4M	196M	2%	/run/user/1000

df -k (kilobytes)

sathish@dark:~\$ df -k

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
tmpfs	202496	1540	200956	1%	/run
/dev/sda3	25106692	12446740	11359268	53%	/
tmpfs	1012472	0	1012472	0%	/dev/shm
tmpfs	5120	4	5116	1%	/run/lock
/dev/sda2	524252	5364	518888	2%	/boot/efi
tmpfs	202492	2416	200076	2%	/run/user/1000

df -m (megabytes)

sathish@dark:~\$ df -m

Filesystem	1M-blocks	Used	Available	Use%	Mounted on
tmpfs	198	2	197	1%	/run
/dev/sda3	24519	12156	11094	53%	/
tmpfs	989	0	989	0%	/dev/shm
tmpfs	5	1	5	1%	/run/lock
/dev/sda2	512	6	507	2%	/boot/efi
tmpfs	198	3	196	2%	/run/user/1000

sathish@dark:~\$

df -t filesystem (specified filesystem)

sathish@dark:~\$ df -t tmpfs

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
tmpfs	202496	1540	200956	1%	/run
tmpfs	1012472	0	1012472	0%	/dev/shm
tmpfs	5120	4	5116	1%	/run/lock
tmpfs	202492	2420	200072	2%	/run/user/1000

df -x filesystem (except given filesystem)

```
sathish@dark:~/demo$ df -x tmpfs
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/sda3	25106692	12434052	11371956	53%	/
/dev/sda2	524252	5364	518888	2%	/boot/efi

```
sathish@dark:~$ sudo df -a
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
sysfs	0	0	0	-	/sys
proc	0	0	0	-	/proc
udev	977792	0	977792	0%	/dev
devpts	0	0	0	-	/dev/pts
tmpfs	202496	1548	200948	1%	/run
/dev/sda3	25106692	12450392	11355616	53%	/
securityfs	0	0	0	-	/sys/kernel/security
tmpfs	1012472	0	1012472	0%	/dev/shm

df -T (print filesystem type)

```
sathish@dark:~$ df -T
```

Filesystem	Type	1K-blocks	Used	Available	Use%	Mounted on
tmpfs	tmpfs	202496	1540	200956	1%	/run
/dev/sda3	ext4	25106692	12449468	11356540	53%	/
tmpfs	tmpfs	1012472	0	1012472	0%	/dev/shm
tmpfs	tmpfs	5120	4	5116	1%	/run/lock
/dev/sda2	vfat	524252	5364	518888	2%	/boot/efi
tmpfs	tmpfs	202492	2412	200080	2%	/run/user/1000
.....						

Free (view free disk space)

```
sathish@dark:~$ free
```

	total	used	free	shared	buff/cache	available
Mem:	2024948	1476104	108856	36928	439988	349548

Swap: 2744316 449872 2294444

sathish@dark:~\$

free -h (human readable)

sathish@dark:~\$ free -h

	total	used	free	shared	buff/cache	available
Mem:	1.9Gi	1.4Gi	96Mi	35Mi	435Mi	337Mi
Swap:	2.6Gi	438Mi	2.2Gi			

sathish@dark:~\$

free -s2 (set delay of seconds to print)

sathish@dark:~\$ free -s2

	total	used	free	shared	buff/cache	available
Mem:	2024948	1485496	65392	43516	474060	334308
Swap:	2744316	547052	2197264			

	total	used	free	shared	buff/cache	available
Mem:	2024948	1485476	65392	43516	474080	334328
Swap:	2744316	547052	2197264			

	total	used	free	shared	buff/cache	available
Mem:	2024948	1482648	65392	46344	476908	334328
Swap:	2744316	547052	2197264			

	total	used	free	shared	buff/cache	available
Mem:	2024948	1482640	65392	46344	476916	334336
Swap:	2744316	547052	2197264			

free -t (view total)

sathish@dark:~\$ free -h -t

	total	used	free	shared	buff/cache	available
Mem:	1.9Gi	1.4Gi	155Mi	39Mi	436Mi	393Mi

Swap:	2.6Gi	556Mi	2.1Gi
Total:	4.5Gi	1.9Gi	2.2Gi

free -w (seperate buffer / cache)

sathish@dark:~\$ free -w

	total	used	free	shared	buffers	cache
Mem:	2024948	1403200	144400	42416	12524	464824
Swap:	2744316	559964	2184352			

watch (update every 2 seconds display on new window)

sathish@dark:~\$ watch free

```

sathish@dark: ~
Every 2.0s: free
6 2023
Mem:      total    used    free    shared  buff/cache   available
Swap:    2024948  1437644    75880     48480     511424    381892
Swap:    2744316  204652   2539664

```

show highlights update time

sathish@dark:~\$ watch -d free

```
sathish@dark: ~  
Every 2.0s: free  
dark: Fri Jan 27 16:14:24 2023  
Mem:      total      used      free      shared  buff/cache  available  
Swap:    2024948    1408356    78848      48644     537744    410908  
          2744316    239580    2504736
```

set number of seconds to update

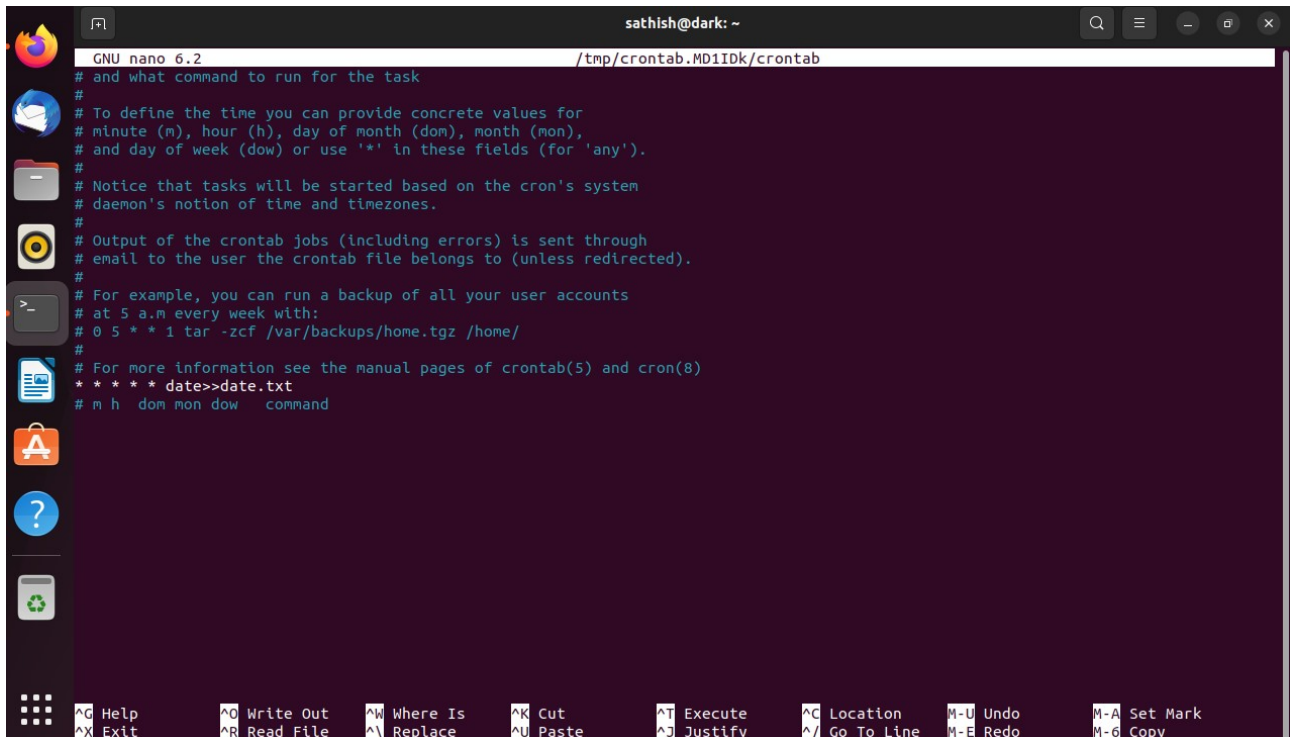
sathish@dark:~\$ watch -n 5 free

```
sathish@dark: ~  
Every 5.0s: free  
dark: Fri Jan 27 16:22:26 2023  
Mem:      total      used      free      shared  buff/cache  available  
Swap:    2024948    1422616    117236      43384     485096    401812  
          2744316    263740    2480576
```

crontab (schedule execution command at specific time)

crontab -e (set schedule command for execution)

sathish@dark:~\$ crontab -e



```
GNU nano 6.2 /tmp/crontab.MD1IDk/crontab
# and what command to run for the task
#
# To define the time you can provide concrete values for
# minute (m), hour (h), day of month (dom), month (mon),
# and day of week (dow) or use '*' in these fields (for 'any').
#
# Notice that tasks will be started based on the cron's system
# daemon's notion of time and timezones.
#
# Output of the crontab jobs (including errors) is sent through
# email to the user the crontab file belongs to (unless redirected).
#
# For example, you can run a backup of all your user accounts
# at 5 a.m every week with:
# 0 5 * * 1 tar -zcf /var/backups/home.tgz /home/
#
# For more information see the manual pages of crontab(5) and cron(8)
* * * * * date>>date.txt
# m h dom mon dow   command
```

view auto execeuted output

sathish@dark:~\$ cat date.txt

Friday 27 January 2023 09:48:01 PM IST

Friday 27 January 2023 09:49:01 PM IST

Friday 27 January 2023 09:50:01 PM IST

how to set up job on crontab

sathish@dark:~\$ sudo cat /etc/crontab

[sudo] password for sathish:

/etc/crontab: system-wide crontab

Unlike any other crontab you don't have to run the `crontab`

command to install the new version when you edit this file

and files in /etc/cron.d. These files also have username fields,

that none of the other crontabs do.

```
SHELL=/bin/sh
```

```
# You can also override PATH, but by default, newer versions inherit it from the
environment
```

```
#PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin
```

```
# Example of job definition:
```

```
# .----- minute (0 - 59)
```

```
# | .----- hour (0 - 23)
```

```
# | | .----- day of month (1 - 31)
```

```
# | | | .----- month (1 - 12) OR jan,feb,mar,apr ...
```

```
# | | | | .---- day of week (0 - 6) (Sunday=0 or 7) OR
```

```
sun,mon,tue,wed,thu,fri,sat
```

```
# | | | | |
```

```
# * * * * * user-name command to be executed
```

```
17 * * * * root    cd / && run-parts --report /etc/cron.hourly
```

```
25 6 * * * root    test -x /usr/sbin/anacron || ( cd / && run-parts --report
/etc/cron.daily )
```

```
47 6 * * 7 root    test -x /usr/sbin/anacron || ( cd / && run-parts --report
/etc/cron.weekly )
```

```
52 6 1 * * root    test -x /usr/sbin/anacron || ( cd / && run-parts --report
/etc/cron.monthly )
```

```
#
```