

Lab-Report

Report No: 06

Course code: ICT-3110

Course title: Operating System Lab

Date of Performance:

Date of Submission:

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3rd year 1st semester

Session: 2017-2018

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Experiment No: 06

Experiment Name: Linux command for process.

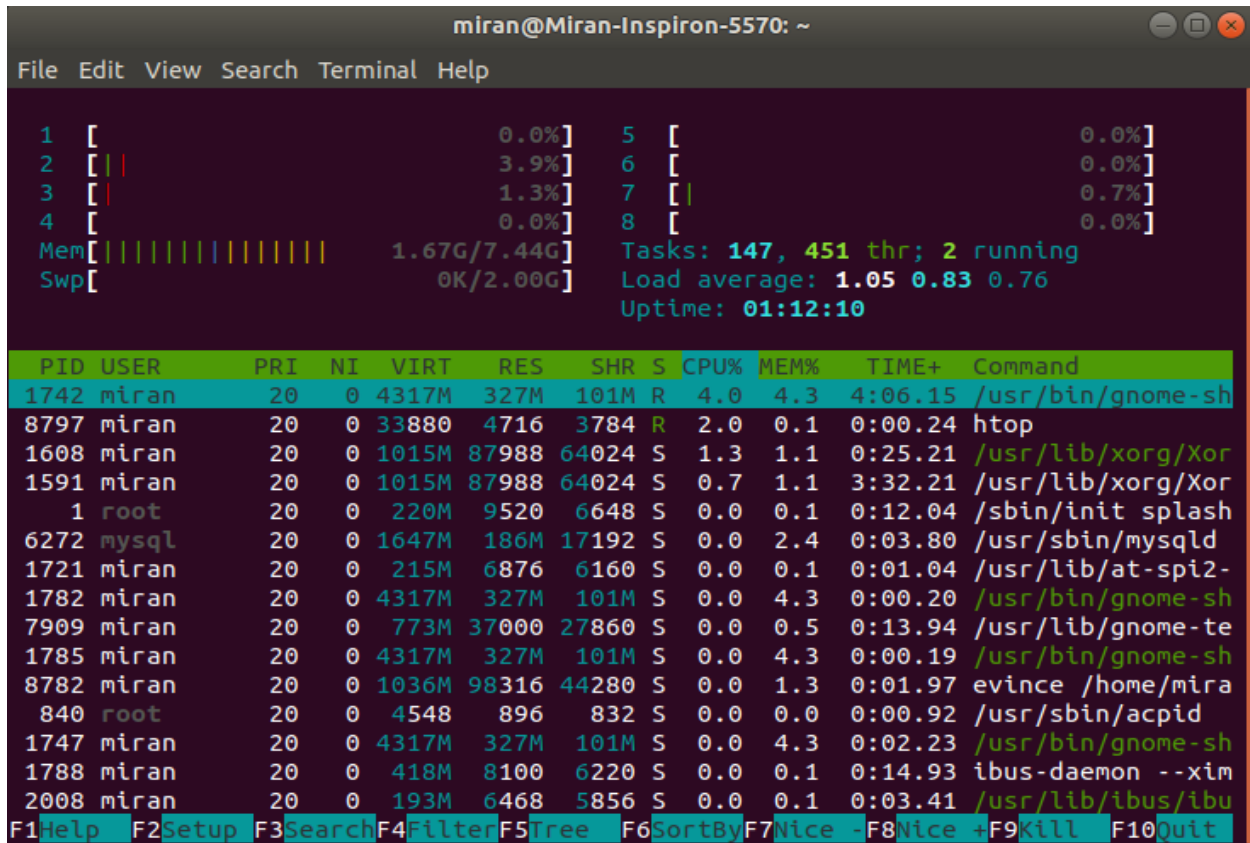
Objectives:

- i) How to manage process from the Linux terminal?
- ii) Run the following process commands in Linux.
Top, htop, Ps, pstree, kill, pgrep, pkill, killall, renice, xkill

Top: The top command is the traditional way to view your system's resource usage and see the processes that are taking up the most system resources. Top displays a list of processes, with the ones using the most CPU at the top.

```
miran@Miran-Inspiron-5570: ~  
File Edit View Search Terminal Help  
miran@Miran-Inspiron-5570:~$ top  
  
top - 11:06:45 up 1:00, 1 user, load average: 2.50, 2.00, 1.24  
top - 11:06:58 up 1:00, 1 user, load average: 2.81, 2.10, 1.29  
Tasks: 352 total, 3 running, 244 sleeping, 0 stopped, 1 zombie  
%Cpu(s): 0.7 us, 0.3 sy, 0.2 ni, 85.6 id, 13.2 wa, 0.0 hi, 0.0 si, 0.0 st  
KiB Mem : 7802200 total, 1580868 free, 2500108 used, 3721224 buff/cache  
KiB Swap: 2097148 total, 2097148 free, 0 used. 4383280 avail Mem  
  
  PID USER      PR  NI   VIRT    RES    SHR S  %CPU  %MEM    TIME+  COMMAND  
 1638 miran    20   0 4127276 229072 105572 R   2.3   2.9   2:37.58 gnome-shell  
   956 root      20   0 517948  13360  10340 S   1.3   0.2   0:00.55 udisksd  
 1493 miran    20   0 704536 113880  97916 S   1.0   1.5   2:08.03 Xorg  
 9528 root      25   5 66204  46720  2564 D   1.0   0.6   0:14.04 dpkg  
 2697 miran    30  10 1007520 169816  99568 S   0.7   2.2   1:03.41 update-man+  
   311 root      20   0      0      0      0 D   0.3   0.0   0:02.13 jbd2/sda7-8  
   314 root       0 -20      0      0      0 I   0.3   0.0   0:00.52 kworker/4:+  
   955 root      20   0 580924  18812  15504 S   0.3   0.2   0:01.87 NetworkMan+  
 1130 gdm        20   0 3741984 155472 103560 S   0.3   2.0   0:07.18 gnome-shell  
 1704 miran    20   0 320524  10948   9060 S   0.3   0.1   0:00.11 gvfs-udisk+  
 3931 miran    20   0 9098160 166568  91792 S   0.3   2.1   0:45.51 chrome  
 4401 miran    20   0 9153576 194232  97616 S   0.3   2.5   1:33.30 chrome  
     1 root      20   0 225708   9744   6972 S   0.0   0.1   0:07.42 systemd
```

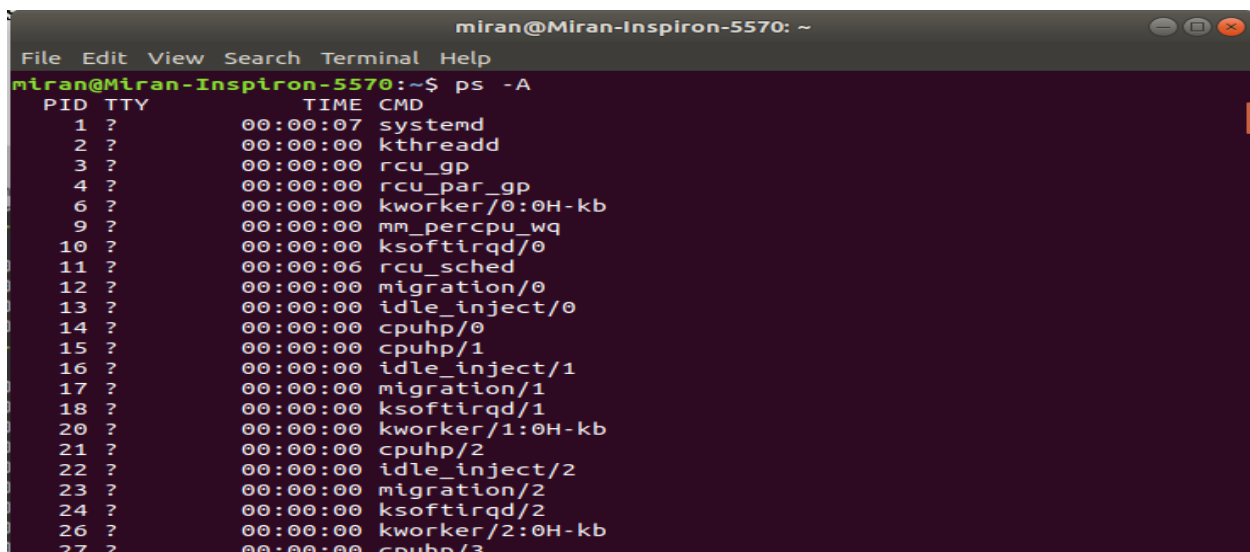
Htop: The **htop** command is an improved top. It's not installed by default on most Linux distributions — here's the command you'll need to install it on Ubuntu:



The screenshot shows the htop interface in a terminal window titled "miran@Miran-Inspiron-5570: ~". The interface has a menu bar (File, Edit, View, Search, Terminal, Help) and a status bar at the bottom with function key shortcuts (F1-Help, F2-Setup, F3-Search, F4-Filter, F5-Tree, F6-SortBy, F7-Nice, F8-Nice, F9-Kill, F10-Quit). The top section displays system statistics: 1 task, 3.9% CPU usage, 1.3% memory usage, 0.0% swap usage, 1.67G/7.44G memory, 0K/2.00G swap, Tasks: 147, 451 threads, 2 running, Load average: 1.05 0.83 0.76, and Uptime: 01:12:10. The main section is a table of running processes.

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
1742	miran	20	0	4317M	327M	101M	R	4.0	4.3	4:06.15	/usr/bin/gnome-sh
8797	miran	20	0	33880	4716	3784	R	2.0	0.1	0:00.24	htop
1608	miran	20	0	1015M	87988	64024	S	1.3	1.1	0:25.21	/usr/lib/xorg/Xor
1591	miran	20	0	1015M	87988	64024	S	0.7	1.1	3:32.21	/usr/lib/xorg/Xor
1	root	20	0	220M	9520	6648	S	0.0	0.1	0:12.04	/sbin/init splash
6272	mysql	20	0	1647M	186M	17192	S	0.0	2.4	0:03.80	/usr/sbin/mysqld
1721	miran	20	0	215M	6876	6160	S	0.0	0.1	0:01.04	/usr/lib/at-spi2-
1782	miran	20	0	4317M	327M	101M	S	0.0	4.3	0:00.20	/usr/bin/gnome-sh
7909	miran	20	0	773M	37000	27860	S	0.0	0.5	0:13.94	/usr/lib/gnome-te
1785	miran	20	0	4317M	327M	101M	S	0.0	4.3	0:00.19	/usr/bin/gnome-sh
8782	miran	20	0	1036M	98316	44280	S	0.0	1.3	0:01.97	evince /home/mira
840	root	20	0	4548	896	832	S	0.0	0.0	0:00.92	/usr/sbin/acpid
1747	miran	20	0	4317M	327M	101M	S	0.0	4.3	0:02.23	/usr/bin/gnome-sh
1788	miran	20	0	418M	8100	6220	S	0.0	0.1	0:14.93	ibus-daemon --xim
2008	miran	20	0	193M	6468	5856	S	0.0	0.1	0:03.41	/usr/lib/ibus/ibu

Ps -A: The **ps** command lists running processes. The following command lists all processes running on your system:



The screenshot shows the output of the `ps -A` command in a terminal window titled "miran@Miran-Inspiron-5570: ~". The output is a table of system processes.

PID	TTY	TIME	CMD
1	?	00:00:07	systemd
2	?	00:00:00	kthreadd
3	?	00:00:00	rcu_gp
4	?	00:00:00	rcu_par_gp
6	?	00:00:00	kworker/0:0H-kb
9	?	00:00:00	mm_percpu_wq
10	?	00:00:00	ksoftirqd/0
11	?	00:00:06	rcu_sched
12	?	00:00:00	migration/0
13	?	00:00:00	idle_inject/0
14	?	00:00:00	cpuhp/0
15	?	00:00:00	cpuhp/1
16	?	00:00:00	idle_inject/1
17	?	00:00:00	migration/1
18	?	00:00:00	ksoftirqd/1
20	?	00:00:00	kworker/1:0H-kb
21	?	00:00:00	cpuhp/2
22	?	00:00:00	idle_inject/2
23	?	00:00:00	migration/2
24	?	00:00:00	ksoftirqd/2
26	?	00:00:00	kworker/2:0H-kb
27	?	00:00:00	cpuhp/3

Ps -A|less: `ps -A` may be too many processes to read at one time, so we can pipe the output through the `less` command to scroll through them at own pace.

```
miran@Miran-Inspiron-5570: ~  
File Edit View Search Terminal Help  
PID TTY          TIME CMD  
1 ?             00:00:08 systemd  
2 ?             00:00:00 kthreadd  
3 ?             00:00:00 rcu_gp  
4 ?             00:00:00 rcu_par_gp  
6 ?             00:00:00 kworker/0:0H-kb  
9 ?             00:00:00 mm_percpu_wq  
10 ?            00:00:00 ksoftirqd/0  
11 ?            00:00:06 rcu_sched  
12 ?            00:00:00 migration/0  
13 ?            00:00:00 idle_inject/0  
14 ?            00:00:00 cpuhp/0  
15 ?            00:00:00 cpuhp/1  
16 ?            00:00:00 idle_inject/1  
17 ?            00:00:00 migration/1  
18 ?            00:00:00 ksoftirqd/1  
20 ?            00:00:00 kworker/1:0H-kb  
21 ?            00:00:00 cpuhp/2  
22 ?            00:00:00 idle_inject/2  
23 ?            00:00:00 migration/2  
24 ?            00:00:00 ksoftirqd/2  
26 ?            00:00:00 kworker/2:0H-kb  
27 ?            00:00:00 cpuhp/3  
:
```

Ps -A|grep: We could also pipe the output through **grep** to search for a specific process without using any other commands. The following command would search for the Firefox process:

```
miran@Miran-Inspiron-5570: ~  
File Edit View Search Terminal Help  
miran@Miran-Inspiron-5570:~$ ps -A|grep chrome  
2818 tty2        00:01:25 chrome  
2829 tty2        00:00:00 chrome  
2833 tty2        00:00:00 chrome  
2851 tty2        00:02:18 chrome  
2856 tty2        00:00:25 chrome  
2944 tty2        00:00:00 chrome  
2946 tty2        00:00:02 chrome  
2970 tty2        00:00:00 chrome  
3406 tty2        00:00:03 chrome  
3426 tty2        00:01:26 chrome  
3512 tty2        00:00:09 chrome  
3570 tty2        00:00:00 chrome  
3583 tty2        00:00:32 chrome  
3597 tty2        00:00:34 chrome  
3629 tty2        00:00:06 chrome  
3695 tty2        00:00:01 chrome  
3701 tty2        00:00:06 chrome  
3711 tty2        00:00:01 chrome  
3759 tty2        00:00:01 chrome  
3931 tty2        00:00:45 chrome  
3959 tty2        00:00:02 chrome  
4019 tty2        00:00:00 chrome  
4045 tty2        00:00:04 chrome
```

Pstree: The **ps**tree command is another way of visualizing processes. It displays them in tree format.

```

miran@Miran-Inspiron-5570: ~
File Edit View Search Terminal Help
miran@Miran-Inspiron-5570:~$ pstree
systemd--ModemManager--2*[{ModemManager}]
      |--NetworkManager--dhclient
      |                     |--2*[{NetworkManager}]
      |--accounts-daemon--2*[{accounts-daemon}]
      |--acpid
      |--aptd--dpkg--linux-firmware.--update-initramf--update-initr+
      |      |--{aptd}
      |--avahi-daemon--avahi-daemon
      |--bluetoothd
      |--boltd--2*[{boltd}]
      |--chrome--2*[cat]
      |          |--chrome--chrome--28*[chrome--12*[{chrome}]]
      |          |          |--3*[chrome--13*[{chrome}]]
      |          |          |--2*[chrome--15*[{chrome}]]
      |          |          |--chrome--4*[{chrome}]
      |          |--nacl_helper
      |          |--chrome--7*[{chrome}]
      |          |--chrome--8*[{chrome}]
      |          |--28*[{chrome}]
      |--colord--2*[{colord}]
      |--cron
      |--cups-browsed--2*[{cups-browsed}]
      |--cupsd

```

Kill: The **kill** command can kill a process, given its process ID. You can get this information from the **ps -A**, **top** or **pgrep** commands.

```

miran@Miran-Inspiron-5570: ~
File Edit View Search Terminal Help
KiB Swap: 2097148 total, 2097148 free, 0 used. 5291676 avail Mem

  PID USER      PR  NI    VIRT    RES    SHR  S  %CPU  %MEM     TIME+ COMMAND
 1591 miran      20   0 1041100   88324   64360 S   16.7   1.1   3:46.14 Xorg
 1742 miran      20   0 4420172  336844 105748 S   16.7   4.3   4:26.98 gnome-shell
 8782 miran      20   0 1068356  105440   44280 S   11.1   1.4   0:06.05 evince
 9247 miran      20   0  44540    4152    3396 R   11.1   0.1   0:00.06 top
 9034 miran      20   0 5036052  274920 143452 S    5.6   3.5   0:47.44 chrome
    1 root        20   0  225828    9520    6648 S    0.0   0.1   0:12.59 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_gp
    4 root         0 -20         0         0         0 I    0.0   0.0   0:00.00 rcu_par_gp
    6 root         0 -20         0         0         0 I    0.0   0.0   0:00.00 kworker/0:
    9 root         0 -20         0         0         0 I    0.0   0.0   0:00.00 mm_percpu_
   10 root        20   0         0         0         0 S    0.0   0.0   0:00.09 ksoftirqd/
   11 root        20   0         0         0         0 I    0.0   0.0   0:05.06 rcu_sched
   12 root        rt    0         0         0         0 S    0.0   0.0   0:00.02 migration/
   13 root       -51   0         0         0         0 S    0.0   0.0   0:00.00 idle_injec
   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
[1]+  Stopped                  top
miran@Miran-Inspiron-5570:~$ kill 9034
miran@Miran-Inspiron-5570:~$ 9034 miran      20   0 5036052  274920 143452 S    5.6
3.5   0:47.44 chrome

```

Pgrep: This command show the all process list in details.

```
miran@Miran-Inspiron-5570: ~  
File Edit View Search Terminal Help  
miran@Miran-Inspiron-5570:~$ pgrep -u miran -a  
1571 /lib/systemd/systemd --user  
1572 (sd-pam)  
1585 /usr/bin/gnome-keyring-daemon --daemonize --login  
1589 /usr/lib/gdm3/gdm-x-session --run-script env GNOME_SHELL_SESSION_MODE=ubuntu  
u gnome-session --session=ubuntu  
1591 /usr/lib/xorg/Xorg vt2 -displayfd 3 -auth /run/user/1000/gdm/Xauthority -ba  
ckground none -noreset -keeptty -verbose 3  
1609 /usr/bin/dbus-daemon --session --address=systemd: --nofork --nopidfile --sy  
stemd-activation --syslog-only  
1613 /usr/lib/gnome-session/gnome-session-binary --session=ubuntu  
1708 /usr/bin/ssh-agent /usr/bin/im-launch env GNOME_SHELL_SESSION_MODE=ubuntu g  
nome-session --session=ubuntu  
1714 /usr/lib/at-spi2-core/at-spi-bus-launcher  
1719 /usr/bin/dbus-daemon --config-file=/usr/share/defaults/at-spi2/accessibilit  
y.conf --nofork --print-address 3  
1721 /usr/lib/at-spi2-core/at-spi2-registryd --use-gnome-session  
1742 /usr/bin/gnome-shell  
1752 /usr/lib/gvfs/gvfsd  
1757 /usr/lib/gvfs/gvfsd-fuse /run/user/1000/gvfs -f -o big_writes  
1768 /usr/bin/pulseaudio --start --log-target=syslog  
1788 ibus-daemon --xim --panel disable  
1789 /usr/libexec/xdg-permission-store  
1796 /usr/lib/gnome-shell/gnome-shell-calendar-server
```

Pkill and xkill: The **pkill** and **killall** commands can kill a process, given its name.

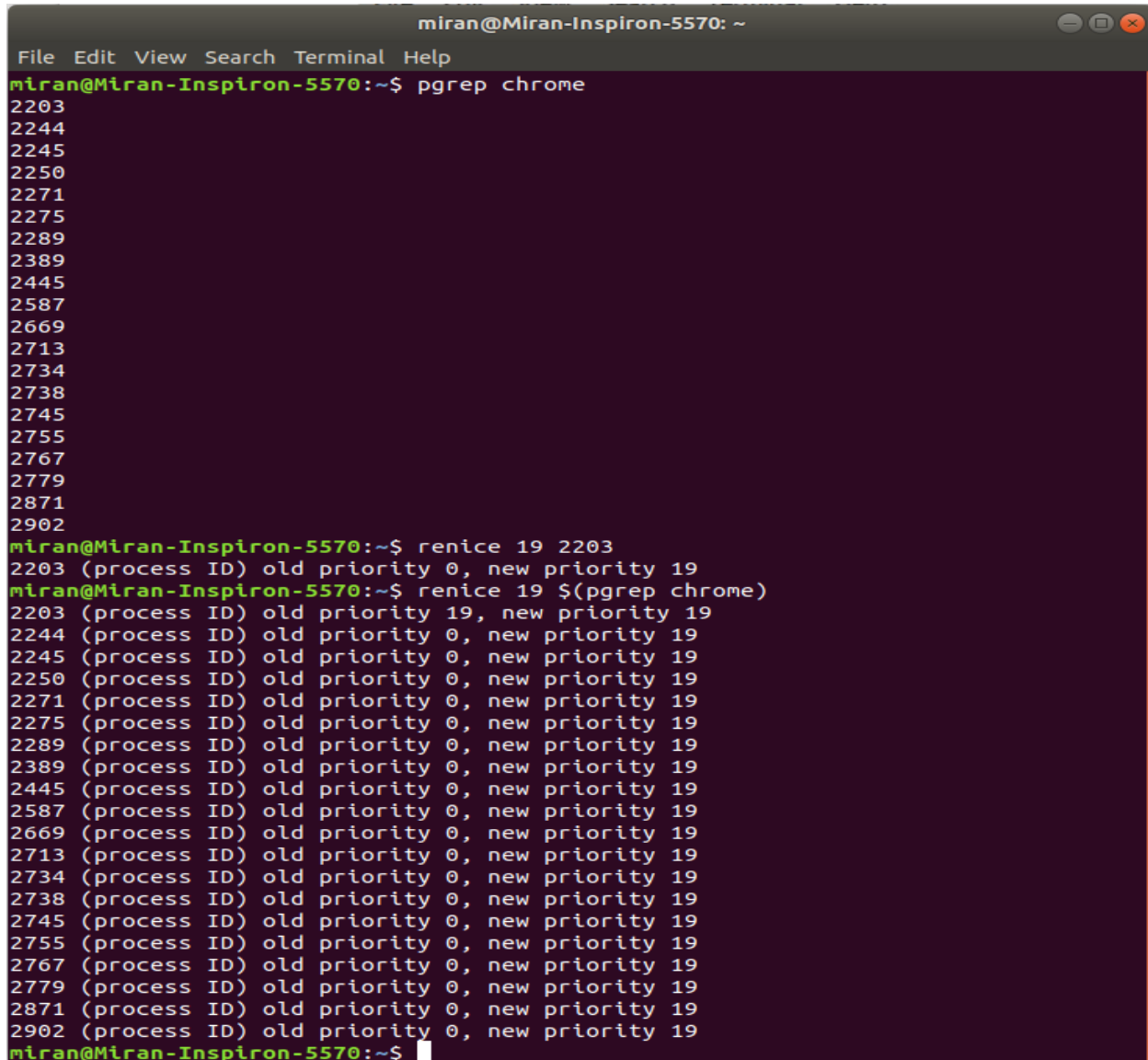
Use either command to kill chrome:

pkill chrome

killall chrome

```
miran@Miran-Inspiron-5570: ~  
File Edit View Search Terminal Help  
miran@Miran-Inspiron-5570:~$ killall chrome  
miran@Miran-Inspiron-5570:~$ pkill chrome  
miran@Miran-Inspiron-5570:~$
```


Renice: The **renice** command changes the nice value of an already running process. The nice value determines what priority the process runs with. A value of **-19** is very high priority, while a value of **19** is very low priority. A value of **0** is the default priority. The renice command requires a process's PID. The following command makes a process run with very low priority:

A terminal window titled 'miran@Miran-Inspiron-5570: ~' with a menu bar (File, Edit, View, Search, Terminal, Help). The user runs 'pgrep chrome' which lists 18 PIDs. Then, the user runs 'renice 19 2203', showing the priority change for PID 2203. Finally, the user runs 'renice 19 \$(pgrep chrome)', which shows the priority change for all 18 PIDs listed in the previous output.

```
miran@Miran-Inspiron-5570: ~  
File Edit View Search Terminal Help  
miran@Miran-Inspiron-5570:~$ pgrep chrome  
2203  
2244  
2245  
2250  
2271  
2275  
2289  
2389  
2445  
2587  
2669  
2713  
2734  
2738  
2745  
2755  
2767  
2779  
2871  
2902  
miran@Miran-Inspiron-5570:~$ renice 19 2203  
2203 (process ID) old priority 0, new priority 19  
miran@Miran-Inspiron-5570:~$ renice 19 $(pgrep chrome)  
2203 (process ID) old priority 0, new priority 19  
2244 (process ID) old priority 0, new priority 19  
2245 (process ID) old priority 0, new priority 19  
2250 (process ID) old priority 0, new priority 19  
2271 (process ID) old priority 0, new priority 19  
2275 (process ID) old priority 0, new priority 19  
2289 (process ID) old priority 0, new priority 19  
2389 (process ID) old priority 0, new priority 19  
2445 (process ID) old priority 0, new priority 19  
2587 (process ID) old priority 0, new priority 19  
2669 (process ID) old priority 0, new priority 19  
2713 (process ID) old priority 0, new priority 19  
2734 (process ID) old priority 0, new priority 19  
2738 (process ID) old priority 0, new priority 19  
2745 (process ID) old priority 0, new priority 19  
2755 (process ID) old priority 0, new priority 19  
2767 (process ID) old priority 0, new priority 19  
2779 (process ID) old priority 0, new priority 19  
2871 (process ID) old priority 0, new priority 19  
2902 (process ID) old priority 0, new priority 19  
miran@Miran-Inspiron-5570:~$
```

Conclusion:

In this lab I learn the Linux command for process. I also run all the command in the terminal and the output is expected.

