Assignment-4

Part-1

Q1) List all running processes using:

a. ps -ef

```
[alice@MyLinuxVM ~]$ ps -ef | head -n 10
UID          PID    PPID  C STIME TTY          TIME CMD
root           1       0  0 11:09 ?        00:00:02 /usr/lib/systemd/systemd rh
gb --switched-root --system --deserialize 31
root           2       0  0 11:09 ?        00:00:00 [kthreadd]
root           3       2  0 11:09 ?        00:00:00 [pool_workqueue_]
root           4       2  0 11:09 ?        00:00:00 [kworker/R-rcu_g]
root           5       2  0 11:09 ?        00:00:00 [kworker/R-sync_]
root           6       2  0 11:09 ?        00:00:00 [kworker/R-slub_]
root           7       2  0 11:09 ?        00:00:00 [kworker/R-netns]
root           9       2  0 11:09 ?        00:00:00 [kworker/0:0H-events_highpr
i]
root          10       2  0 11:09 ?        00:00:00 [kworker/u4:0-events_unboun
d]
```

b. ps –aux

```
[alice@MyLinuxVM ~]$ ps -aux | head -n 10
USER         PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root           1  0.0  0.7 108284 13352 ?        Ss   11:09   0:02 /usr/lib/systemd/systemd rhgb -
 --deserialize 31
root           2  0.0  0.0      0     0 ?        S    11:09   0:00 [kthreadd]
root           3  0.0  0.0      0     0 ?        S    11:09   0:00 [pool_workqueue_]
root           4  0.0  0.0      0     0 ?        I<   11:09   0:00 [kworker/R-rcu_g]
root           5  0.0  0.0      0     0 ?        I<   11:09   0:00 [kworker/R-sync_]
root           6  0.0  0.0      0     0 ?        I<   11:09   0:00 [kworker/R-slub_]
root           7  0.0  0.0      0     0 ?        I<   11:09   0:00 [kworker/R-netns]
root           9  0.0  0.0      0     0 ?        I<   11:09   0:00 [kworker/0:0H-events_highpri]
root          11  0.0  0.0      0     0 ?        I<   11:09   0:00 [kworker/R-mm_pe]
[alice@MyLinuxVM ~]$
```

Q2) Identify – PID, User, CPU usage, Memory usage

- ➔ For the first image (consider the first process) – PID is 1 and user is “root”, and CPU usage is 0 (represented by the column C). Memory usage is not visible.
- ➔ For the second image (consider the first process) – PID is 1 and user is “root” and CPU usage is “0.0” and memory usage is “0.7%”.

Part-2

Q1) Start a long running command: sleep 1000&

```
[root@MyLinuxVM ~]# sleep 1000&
[1] 2426
```

Q2) View running background jobs.

```
[root@MyLinuxVM ~]# jobs
[1]+  Running                 sleep 1000 &
[root@MyLinuxVM ~]# S
```

Q3) Bring the job to foreground and send it back to background

```
[root@MyLinuxVM ~]# fg %1
sleep 1000
^Z
[1]+  Stopped                 sleep 1000
[root@MyLinuxVM ~]# bg %1
[1]+ sleep 1000 &
[root@MyLinuxVM ~]# jobs
[1]+  Running                 sleep 1000 &
[root@MyLinuxVM ~]#
```

Part-3

Q1) Gracefully stop the sleep process using SIGTERM

Q2) Verify if the process still exists

```
[root@MyLinuxVM ~]# sleep 1000&
[2] 2612
[root@MyLinuxVM ~]# ps -p 2612
    PID TTY          TIME CMD
   2612 pts/0    00:00:00 sleep
[root@MyLinuxVM ~]# kill -SIGTERM 2612
[2]+  Terminated              sleep 1000
[root@MyLinuxVM ~]# ps -p 2612
    PID TTY          TIME CMD
[root@MyLinuxVM ~]#
```

Q3) Forcefully terminate it using SIGKILL

```
[root@MyLinuxVM ~]# sleep 1000&
[2] 2638
[root@MyLinuxVM ~]# kill -SIGKILL 2638
[2]+  Killed                  sleep 1000
[root@MyLinuxVM ~]# ps -p 2638
    PID TTY          TIME CMD
[root@MyLinuxVM ~]#
```

Q4) Explain the difference between: kill -15 and kill -9

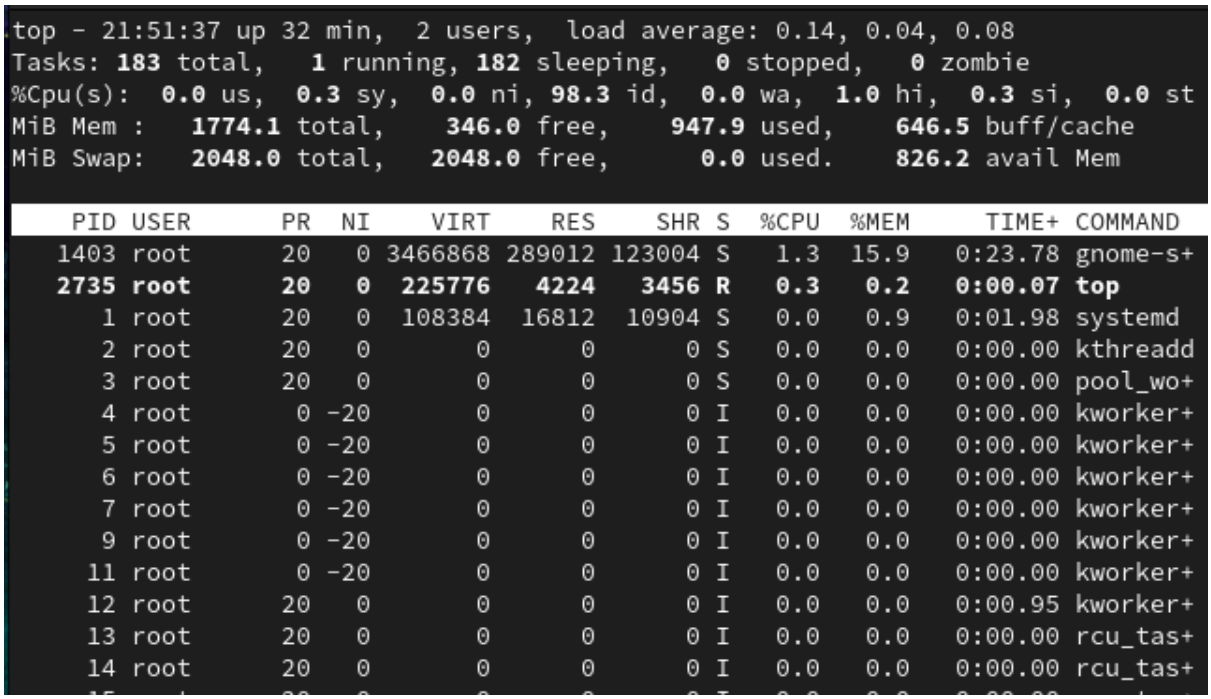
- ➔ SIGTERM is known as graceful termination – it sends the process signals to terminate and allows the process to save its task which it has done till and then and clean up and exit properly. SIGKILL on the other hand is forceful termination – it asks the process to end immediately without allowing any kind of cleanup and data saving.

Part-4

Q1) Use top command to identify top CPU consuming processes and sort by memory usage

Q2) Observe changes in real time

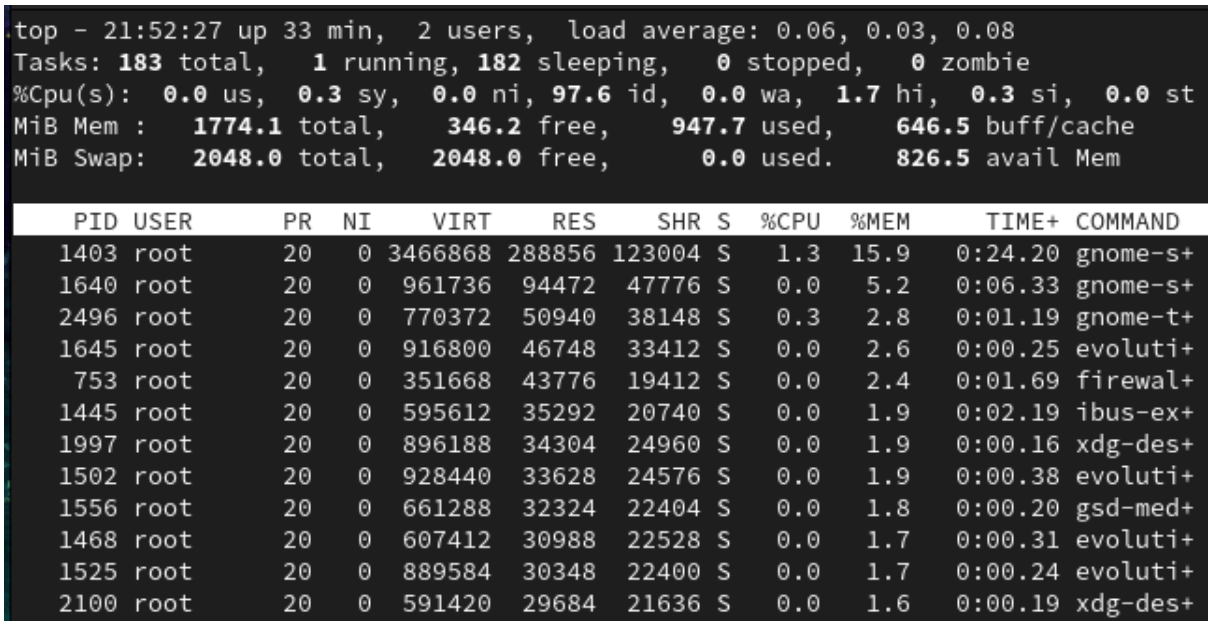
(By CPU usage)



```
top - 21:51:37 up 32 min,  2 users,  load average: 0.14, 0.04, 0.08
Tasks: 183 total,   1 running, 182 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.3 sy,  0.0 ni, 98.3 id,  0.0 wa,  1.0 hi,  0.3 si,  0.0 st
MiB Mem :   1774.1 total,    346.0 free,    947.9 used,    646.5 buff/cache
MiB Swap:   2048.0 total,   2048.0 free,      0.0 used.    826.2 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   1403 root      20   0 3466868 289012 123004 S   1.3  15.9   0:23.78 gnome-s+
   2735 root      20   0  225776   4224   3456 R   0.3   0.2   0:00.07 top
      1 root      20   0  108384  16812  10904 S   0.0   0.9   0:01.98 systemd
      2 root      20   0       0      0      0 S   0.0   0.0   0:00.00 kthreadd
      3 root      20   0       0      0      0 S   0.0   0.0   0:00.00 pool_wo+
      4 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
      5 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
      6 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
      7 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
      9 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
     11 root       0 -20       0      0      0 I   0.0   0.0   0:00.00 kworker+
     12 root      20   0       0      0      0 I   0.0   0.0   0:00.95 kworker+
     13 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tas+
     14 root      20   0       0      0      0 I   0.0   0.0   0:00.00 rcu_tas+
```

(By memory usage)



```
top - 21:52:27 up 33 min,  2 users,  load average: 0.06, 0.03, 0.08
Tasks: 183 total,   1 running, 182 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.0 us,  0.3 sy,  0.0 ni, 97.6 id,  0.0 wa,  1.7 hi,  0.3 si,  0.0 st
MiB Mem :   1774.1 total,    346.2 free,    947.7 used,    646.5 buff/cache
MiB Swap:   2048.0 total,   2048.0 free,      0.0 used.    826.5 avail Mem

    PID USER      PR  NI    VIRT    RES    SHR S  %CPU  %MEM     TIME+ COMMAND
   1403 root      20   0 3466868 288856 123004 S   1.3  15.9   0:24.20 gnome-s+
   1640 root      20   0  961736  94472  47776 S   0.0   5.2   0:06.33 gnome-s+
   2496 root      20   0  770372  50940  38148 S   0.3   2.8   0:01.19 gnome-t+
   1645 root      20   0  916800  46748  33412 S   0.0   2.6   0:00.25 evoluti+
    753 root      20   0  351668  43776  19412 S   0.0   2.4   0:01.69 firewal+
   1445 root      20   0  595612  35292  20740 S   0.0   1.9   0:02.19 ibus-ex+
   1997 root      20   0  896188  34304  24960 S   0.0   1.9   0:00.16 xdg-des+
   1502 root      20   0  928440  33628  24576 S   0.0   1.9   0:00.38 evoluti+
   1556 root      20   0  661288  32324  22404 S   0.0   1.8   0:00.20 gsd-med+
   1468 root      20   0  607412  30988  22528 S   0.0   1.7   0:00.31 evoluti+
   1525 root      20   0  889584  30348  22400 S   0.0   1.7   0:00.24 evoluti+
   2100 root      20   0  591420  29684  21636 S   0.0   1.6   0:00.19 xdg-des+
```