

Nandita M

CED19I056

```
nandita@nandita-VirtualBox:~/Documents$ time who>myfile.txt
real    0m0.005s
user    0m0.003s
sys     0m0.002s
nandita@nandita-VirtualBox:~/Documents$ more myfile.txt
nandita :0                2021-08-15 20:35 (:0)
```

```
nandita@nandita-VirtualBox:~/Documents$ ps
  PID TTY          TIME CMD
 2266 pts/0        00:00:00 bash
 2554 pts/0        00:00:00 ps
```

```
nandita@nandita-VirtualBox:~/Documents$ top
top - 20:45:44 up 10 min,  1 user,  load average: 0.05, 0.13, 0.11
Tasks: 186 total,  1 running, 185 sleeping,  0 stopped,  0 zombie
%Cpu(s):  0.2 us,  0.5 sy,  0.0 ni, 99.2 id,  0.2 wa,  0.0 hi,  0.0 si,  0.0 st
MiB Mem : 1985.1 total,  313.5 free,  643.8 used, 1027.8 buff/cache
MiB Swap: 1873.4 total, 1873.4 free,   0.0 used. 1171.1 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR  S  %CPU  %MEM     TIME+ COMMAND
 1460 nandita    20   0 163996 2720 2352 S   1.3   0.1   0:04.83 VBoxClient
 1311 nandita    20   0 856732 84140 52568 S   1.0   4.1   0:16.23 Xorg
 1550 nandita    20   0 4206968 343556 132340 S   1.0  16.9   0:20.32 gnome-shell
 2249 nandita    20   0 828828 53464 39844 S   0.3   2.6   0:03.16 gnome-terminal-
2493 root       20   0      0      0      0 I   0.3   0.0   0:00.01 kworker/u4:2-events_freezable_power_
   1 root      20   0 167712 11840 8584 S   0.0   0.6   0:02.18 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/0:0H-events_highpri
   7 root      20   0      0      0      0 I   0.0   0.0   0:00.22 kworker/u4:0-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   0:00.18 ksoftirqd/0
  12 root      20   0      0      0      0 I   0.0   0.0   0:00.32 rcu_sched
  13 root      rt   0      0      0      0 S   0.0   0.0   0:00.03 migration/0
  14 root     -51   0      0      0      0 S   0.0   0.0   0:00.00 idle_inject/0
  15 root      20   0      0      0      0 I   0.0   0.0   0:00.17 kworker/0:1-events
  16 root      20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/0
  17 root      20   0      0      0      0 S   0.0   0.0   0:00.00 cpuhp/1
  18 root     -51   0      0      0      0 S   0.0   0.0   0:00.00 idle_inject/1
  19 root      rt   0      0      0      0 S   0.0   0.0   0:00.25 migration/1
  20 root      20   0      0      0      0 S   0.0   0.0   0:00.15 ksoftirqd/1
  22 root       0 -20      0      0      0 I   0.0   0.0   0:00.00 kworker/1:0H-events_highpri
  23 root      20   0      0      0      0 S   0.0   0.0   0:00.00 kdevtmpfs
```

```
nandita@DESKTOP-2LH63U6: ~
DESKTOP-2LH63U6 (Ubuntu 20.04 64bit / Linux 5.4.72-microsoft-standard-WSL2) - IP 172.19.142.226/20 Pub 27.5.212.158 Uptime: 0:00:39

CPU [ 0.1%] CPU - 0.1% nice: 0.0% ctx_sw: 37 MEM - 4.6% active: 60.7M SWAP - 0.0% LOAD 8-core
MEM [ 4.6%] user: 0.0% irq: 0.0% inter: 8 total: 6.02G inactive: 55.6M total: 2.00G 1 min: 0.05
SWAP [ 0.0%] system: 0.1% iowait: 0.0% sw_int: 43 used: 284M buffers: 9.04M used: 0 5 min: 0.01
idle: 99.9% steal: 0.0% free: 5.74G cached: 81.8M free: 2.00G 15 min: 0.00

NETWORK Rx/s Tx/s TASKS 5 (6 thr), 1 run, 4 slp, 0 oth sorted automatically by CPU consumption
eth0 0b 0b
lo 0b 0b
CPU% MEM% VIRT RES PID USER TIME+ THR NI S R/s W/s Command
DefaultGateway Timeout 0.0 0.1 9.80M 4.86M 9 nandita 0:00 1 0 S 0 0 -bash
0.0 0.0 892K 584K 1 root 0:00 2 0 S ? ? //init
DISK I/O R/s W/s 0.0 0.0 892K 88K 7 root 0:00 1 0 S ? ? //init
sda 0 2.01M 0.0 0.0 892K 88K 8 root 0:00 1 0 S ? ? //init
sdb 0 2K

FILE SYS Used Total
/ (sdb) 1.91G 251G
```

```
nandita@nandita-VirtualBox:~$ ps -aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.1  0.5 167712 11844 ?        Ss   20:35   0:02 /sbin/init splash
root         2  0.0  0.0      0     0 ?        S    20:35   0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I<   20:35   0:00 [rcu_gp]
root         4  0.0  0.0      0     0 ?        I<   20:35   0:00 [rcu_par_gp]
root         6  0.0  0.0      0     0 ?        I<   20:35   0:00 [kworker/0:0H-events_highpri]
root         8  0.0  0.0      0     0 ?        I<   20:35   0:00 [mm_percpu_wq]
root         9  0.0  0.0      0     0 ?        S    20:35   0:00 [rcu_tasks_rude_]
root        10  0.0  0.0      0     0 ?        S    20:35   0:00 [rcu_tasks_trace]
root        11  0.0  0.0      0     0 ?        S    20:35   0:00 [ksoftirqd/0]
root        12  0.0  0.0      0     0 ?        I    20:35   0:00 [rcu_sched]
root        13  0.0  0.0      0     0 ?        S    20:35   0:00 [migration/0]
root        14  0.0  0.0      0     0 ?        S    20:35   0:00 [idle_inject/0]
root        16  0.0  0.0      0     0 ?        S    20:35   0:00 [cpuhp/0]
root        17  0.0  0.0      0     0 ?        S    20:35   0:00 [cpuhp/1]
root        18  0.0  0.0      0     0 ?        S    20:35   0:00 [idle_inject/1]
root        19  0.0  0.0      0     0 ?        S    20:35   0:00 [migration/1]
root        20  0.0  0.0      0     0 ?        S    20:35   0:00 [ksoftirqd/1]
root        22  0.0  0.0      0     0 ?        I<   20:35   0:00 [kworker/1:0H-events_highpri]
root        23  0.0  0.0      0     0 ?        S    20:35   0:00 [kdevtmpfs]
root        24  0.0  0.0      0     0 ?        I<   20:35   0:00 [netns]
root        25  0.0  0.0      0     0 ?        I<   20:35   0:00 [inet_frag_wq]
root        26  0.0  0.0      0     0 ?        S    20:35   0:00 [kauditd]
root        27  0.0  0.0      0     0 ?        S    20:35   0:00 [khungtaskd]
root        28  0.0  0.0      0     0 ?        S    20:35   0:00 [oom_reaper]
root        29  0.0  0.0      0     0 ?        I<   20:35   0:00 [writeback]
root        30  0.0  0.0      0     0 ?        S    20:35   0:00 [kcompactd0]
root        31  0.0  0.0      0     0 ?        SN   20:35   0:00 [ksmd]
root        32  0.0  0.0      0     0 ?        SN   20:35   0:00 [khugepaged]
root        36  0.1  0.0      0     0 ?        I    20:35   0:02 [kworker/1:1-events]
root        79  0.0  0.0      0     0 ?        I<   20:35   0:00 [kintegrityd]
root        80  0.0  0.0      0     0 ?        I<   20:35   0:00 [kblockd]
root        81  0.0  0.0      0     0 ?        I<   20:35   0:00 [blkcg_punt_bio]
root        82  0.0  0.0      0     0 ?        I<   20:35   0:00 [tpm_dev_wq]
root        83  0.0  0.0      0     0 ?        I<   20:35   0:00 [ata_sff]
root        84  0.0  0.0      0     0 ?        I<   20:35   0:00 [md]
root        85  0.0  0.0      0     0 ?        I<   20:35   0:00 [edac-poller]
```

```
nandita@nandita-VirtualBox:~$ pgrep -u root
```

```
1  
2  
3  
4  
6  
8  
9  
10  
11  
12  
13  
14  
16  
17  
18  
19  
20  
22  
23  
24  
25  
26  
27  
28  
29  
30  
31  
32  
36  
79  
80  
81
```

```
nandita@nandita-VirtualBox:~$ ps 2266
```

PID	TTY	STAT	TIME	COMMAND
2266	pts/0	Ss	0:00	bash

```
nandita@nandita-VirtualBox:~$ kill 2266
```

```
nandita@nandita-VirtualBox:~$ ps
```

PID	TTY	TIME	CMD
2266	pts/0	00:00:00	bash
3975	pts/0	00:00:00	ps

```
nandita@nandita-VirtualBox:~$ pkill bash
```

```
nandita@nandita-VirtualBox:~$
```

```
D:\SEMESTER 5\Operating Systems\Lab>cd "d:\SEMESTER 5\Operating Systems\Lab\" && gcc Ques1.c -o Ques1 && "d:\SEMESTER 5\Operating Systems\Lab\"Ques1
Enter the number of processes :6
Enter the Arrival Time ,Burst Time for process 1 :
0 3
Enter the Arrival Time ,Burst Time for process 2 :
0 4
Enter the Arrival Time ,Burst Time for process 3 :
0 7
Enter the Arrival Time ,Burst Time for process 4 :
0 2
Enter the Arrival Time ,Burst Time for process 5 :
0 4
Enter the Arrival Time ,Burst Time for process 6 :
0 6
```

PID	AT	BT	CT	TAT	WT
1	0	3	3	3	0
2	0	4	7	7	3
3	0	7	14	14	7
4	0	2	16	16	14
5	0	4	20	20	16
6	0	6	26	26	20

Average Turnaround Time is 14.333
Average Waiting Time is 10.000

```
D:\SEMESTER 5\Operating Systems\Lab>cd "d:\SEMESTER 5\Operating Systems\Lab\" && gcc Ques1.c -o Ques1 && "d:\SEMESTER 5\Operating Systems\Lab\"Ques1
Enter the number of processes :6
Enter the Arrival Time ,Burst Time for process 1 :
4 7
Enter the Arrival Time ,Burst Time for process 2 :
1 4
Enter the Arrival Time ,Burst Time for process 3 :
3 2
Enter the Arrival Time ,Burst Time for process 4 :
5 9
Enter the Arrival Time ,Burst Time for process 5 :
6 3
Enter the Arrival Time ,Burst Time for process 6 :
2 6
```

PID	AT	BT	CT	TAT	WT
2	1	4	5	4	0
6	2	6	11	9	3
3	3	2	13	10	8
1	4	7	20	16	9
4	5	9	29	24	15
5	6	3	32	26	23

Average Turnaround Time is 14.833
Average Waiting Time is 9.667

```
D:\SEMESTER 5\Operating Systems\Lab>cd "d:\SEMESTER 5\Operating Systems\Lab\" && gcc Ques2.a.c -o Ques2.a && "d:\SEMESTER 5\Operating Systems\Lab\"Ques2.a
Enter the number of processes :5
Enter the Arrival Time ,Burst Time for process 1 :
0 2
Enter the Arrival Time ,Burst Time for process 2 :
0 7
Enter the Arrival Time ,Burst Time for process 3 :
0 4
Enter the Arrival Time ,Burst Time for process 4 :
0 1
Enter the Arrival Time ,Burst Time for process 5 :
0 3
```

PID	AT	BT	CT	TAT	WT
4	0	1	1	1	0
1	0	2	3	3	1
5	0	3	6	6	3
3	0	4	10	10	6
2	0	7	17	17	10

Average Turnaround Time is 7.400
Average Waiting Time is 4.000

```
D:\SEMESTER 5\Operating Systems\Lab>cd "d:\SEMESTER 5\Operating Systems\Lab\" && g++ Ques2.b.cpp -o Ques2.b && "d:\SEMESTER 5\Operating Systems\Lab\"Ques2.b
Enter the number of processes :5
Enter the Arrival Time ,Burst Time for process 1 :
2 3
Enter the Arrival Time ,Burst Time for process 2 :
0 4
Enter the Arrival Time ,Burst Time for process 3 :
4 2
Enter the Arrival Time ,Burst Time for process 4 :
5 4
Enter the Arrival Time ,Burst Time for process 5 :
3 1
```

PID	AT	BT	CT	TAT	WT
2	0	4	4	4	0
5	3	1	5	2	1
3	4	2	7	3	1
1	2	3	10	8	5
4	5	4	14	9	5

Average Turnaround Time is 5.200
Average Waiting Time is 2.400

time-time command in linux is used to execute a command and prints a summary of real-time user CPU-time and system CPU time spent by executing a command when it terminates.

Syntax : time [option] [command].

who : who command is used to find out the following information

- ① Time of last system boot.
- ② Current run level of the system.
- ③ List of logged in users and more.

Syntax : who [options] [filename]

ps : ps cmd is used to list the current running processes and PID's along with some other information depending on different options.

Syntax : ps.

top : top command is used to show the linux processes. It provides a dynamic real-time view of the running system.

Syntax : top

glance: glances is a cross-platform command line curses-based system monitoring tool written in python language. Which uses the psutil library to get informations from the system.

kill: kill command is used to terminate processes manually. kill command sends a signal to process which terminates the process.
kill -l : To display all the available signals. you can use ~~below~~.

~~kill~~

kill -pid : To show how to use a PID with the kill command.

pkill: pkill is a command line utility that sends signals to processes of a running program based on a given criteria. The process can be specified by their full or partial names, a user running the process, or other attributes.
pkill [options] <pattern>.

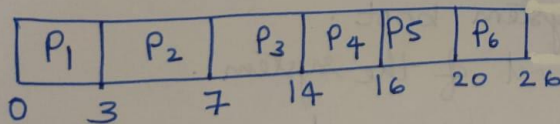
pgrep: ~~pgrep~~ is pgrep. is a command line utility that allows you to find the process ID's of a running program based on given criteria. It can be a full or partial process name, a user running the process or other attributes.
pgrep [options] <pattern>

1) a) All arriving at time 0.

PID	AT	BT	CT	TAT	WT	FCFS
1	0	3	3	3	0	CED19IOS6 M. Nandita
2	0	4	7	7	3	
3	0	7	14	14	7	
4	0	2	16	16	14	
5	0	4	20	20	16	
6	0	6	26	26	20	

14.33 units

Gantt CHART



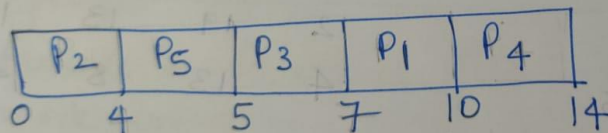
Average TAT = ~~24.33~~

Average WT = ~~29.99~~ 10 units

b) Arriving at different times.

Process Id	AT	burst	CT	TAT	WT
P ₁	2	3	10	8	5
P ₂	0	4	4	4	0
P ₃	4	2	7	3	1
P ₄	5	4	14	9	5
P ₅	3	1	5	2	1

b)



Average TAT = 5.2 units

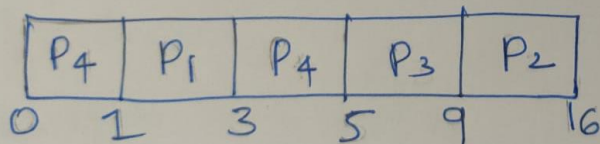
Average WT = 2.4 units

2) a) All arriving at time 0..

M. Nandita

CE0191056

Process Id	AT	BT	CT	TAT	WT
P1	0	2	3	3	1
P2	0	7	17	17	10
P3	0	4	10	10	5
P4	0	1	1	1	0
P5	0	3	6	6	2

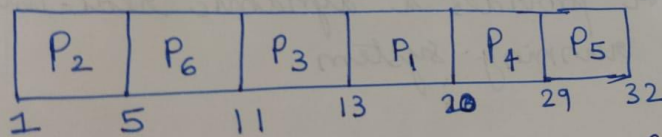


Average TAT = 7.4 units

Average WT = 4.00 units

b) Arriving at different times.

PID	AT	BT	CT	TAT	WT
1	4	7	20	16	9
2	1	4	5	4	0
3	3	2	13	10	8
4	5	9	29	24	15
5	6	3	32	26	23
6	2	6	11	9	3



Average TAT = 14.833 units

Average WT = 9.667 units (ms)