

# Operációs rendszerek

## 4.Gyakorlat

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### **Készítette:**

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Neptunkód: CV72CL

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1. **Feladat:** Linux OS-n futtassa a következő parancsokat, vizsgálja meg milyen szolgáltatásokat biztosít, írja le egy-egy mondattal. Készítsen egy képernyőképet

```
asd@asd-VirtualBox:~$ top
```

top - 14:30:55 up 25 min, 1 user, load average: 0,24, 0,08, 0,09  
Tasks: 207 total, 3 running, 204 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 0,5 us, 0,3 sy, 0,0 ni, 99,1 id, 0,0 wa, 0,0 hi, 0,1 si, 0,0 st  
MiB Mem : 1967,2 total, 386,6 free, 991,7 used, 785,9 buff/cache  
MiB Swap: 2680,0 total, 2599,8 free, 80,2 used, 975,5 avail Mem

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1371	asd	20	0	4845620	265868	153860	R	4,7	13,2	1:17.92	cinnamon
871	root	20	0	504136	188664	83868	S	2,7	9,4	0:33.90	Xorg
1720	asd	20	0	547048	42332	31232	S	0,7	2,1	0:02.22	gnome-terminal-
93	root	20	0	0	0	0	I	0,3	0,0	0:00.53	kworker/3:3-events
637	root	20	0	258516	14080	12160	S	0,3	0,7	0:03.22	touchegg
1	root	20	0	22532	13188	9348	S	0,0	0,7	0:03.12	systemd
2	root	20	0	0	0	0	S	0,0	0,0	0:00.05	kthreadd
3	root	20	0	0	0	0	S	0,0	0,0	0:00.00	pool_workqueue_release
4	root	0	-20	0	0	0	I	0,0	0,0	0:00.00	kworker/R-rcu_g
5	root	0	-20	0	0	0	I	0,0	0,0	0:00.00	kworker/R-rcu_p
6	root	0	-20	0	0	0	I	0,0	0,0	0:00.00	kworker/R-slub_
7	root	0	-20	0	0	0	I	0,0	0,0	0:00.00	kworker/R-netns
10	root	0	-20	0	0	0	I	0,0	0,0	0:00.48	kworker/0:0H-kblockd
12	root	0	-20	0	0	0	I	0,0	0,0	0:00.00	kworker/R-mm_pe
13	root	20	0	0	0	0	I	0,0	0,0	0:00.00	rcu_tasks_kthread
14	root	20	0	0	0	0	I	0,0	0,0	0:00.00	rcu_tasks_rude_kthread
15	root	20	0	0	0	0	I	0,0	0,0	0:00.00	rcu_tasks_trace_kthread
16	root	20	0	0	0	0	S	0,0	0,0	0:00.11	ksoftirqd/0
17	root	20	0	0	0	0	I	0,0	0,0	0:01.13	rcu_preempt
18	root	rt	0	0	0	0	S	0,0	0,0	0:00.07	migration/0
19	root	-51	0	0	0	0	S	0,0	0,0	0:00.00	idle_inject/0

- A „top” parancs segítségével lekérdeztem a futó processzeket terhelés szerint
- A rendszer aktivitásról és a hardverről az információkat a „vmstat” parancsal kértem le, illetve a „-d” kapcsoló segítségével kiírtam a memóriahasználatot és lemez I/O statisztikákat és a „-a” kapcsoló segítségével kiírtam az aktív és inaktív memória lapokat

```
asd@asd-VirtualBox:~$ vmstat
```

procs				memory				swap		io		system		cpu			
r	b	swpd	free	buff	cache	si	so	bi	bo	in	cs	us	sy	id	wa	st	gu
2	0	82156	395852	8980	796004	3	43	526	79	444	0	1	1	98	0	0	0

```
asd@asd-VirtualBox:~$ vmstat -d
```

disk				reads				writes				IO	
	total	merged	sectors	ms	total	merged	sectors	ms	cur	sec			
loop0	0	0	0	0	0	0	0	0	0	0			
loop1	0	0	0	0	0	0	0	0	0	0			
loop2	0	0	0	0	0	0	0	0	0	0			
loop3	0	0	0	0	0	0	0	0	0	0			
loop4	0	0	0	0	0	0	0	0	0	0			
loop5	0	0	0	0	0	0	0	0	0	0			
loop6	0	0	0	0	0	0	0	0	0	0			
loop7	0	0	0	0	0	0	0	0	0	0			
sr0	0	0	0	0	0	0	0	0	0	0			
sda	22716	9107	2031434	46772	3053	25721	307810	26654	0	33			

```
asd@asd-VirtualBox:~$ vmstat -a
```

procs				memory				swap		io		system		cpu			
r	b	swpd	free	inact	active	si	so	bi	bo	in	cs	us	sy	id	wa	st	gu
5	0	82156	395852	1004848	370132	3	43	521	79	444	0	1	1	98	0	0	0

```
asd@asd-VirtualBox:~$
```

- c.) A „w” parancsal lekérdeztem, hogy ki van bejelentkezve a rendszerbe, és éppen mit csinál

```
asd@asd-VirtualBox: ~  
asd@asd-VirtualBox:~$ w  
14:48:22 up 42 min, 1 user, load average: 0,16, 0,05, 0,04  
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT  
asd       -                14:05    38:14   0.00s   0.06s lightdm --session-child 13 16  
asd@asd-VirtualBox:~$
```

- d.) A „who -b” parancsal kiírtam a szerver futásának kezdő idejét

```
asd@asd-VirtualBox: ~  
asd@asd-VirtualBox:~$ who -b  
system boot 2025-03-25 14:05  
asd@asd-VirtualBox:~$
```

- e.) fgjhklé

```
asd@asd-VirtualBox: ~  
asd@asd-VirtualBox:~$ ps -e  
PID TTY      TIME CMD  
1 ?        00:00:03 systemd  
2 ?        00:00:00 kthreadd  
3 ?        00:00:00 pool_workqueue_release  
4 ?        00:00:00 kworker/R-rcu_g  
5 ?        00:00:00 kworker/R-rcu_p  
6 ?        00:00:00 kworker/R-slub  
7 ?        00:00:00 kworker/R-netns  
10 ?       00:00:00 kworker/0:0H-kblockd  
12 ?       00:00:00 kworker/R-mm_pe  
13 ?       00:00:00 rcu_tasks_kthread  
14 ?       00:00:00 rcu_tasks_rude_kthread  
15 ?       00:00:00 rcu_tasks_trace_kthread  
16 ?       00:00:00 ksoftirqd/0  
17 ?       00:00:01 rcu_preempt  
18 ?       00:00:00 migration/0  
19 ?       00:00:00 idle_inject/0  
20 ?       00:00:00 cpuhp/0  
21 ?       00:00:00 cpuhp/1  
22 ?       00:00:00 idle_inject/1  
23 ?       00:00:00 migration/1  
24 ?       00:00:00 ksoftirqd/1  
25 ?       00:00:00 kworker/1:0-events  
27 ?       00:00:00 cpuhp/2  
28 ?       00:00:00 idle_inject/2  
29 ?       00:00:00 migration/2  
30 ?       00:00:00 ksoftirqd/2  
31 ?       00:00:00 kworker/2:0-events  
32 ?       00:00:00 kworker/2:0H-kblockd  
33 ?       00:00:00 cpuhp/3  
34 ?       00:00:00 idle_inject/3  
35 ?       00:00:00 migration/3  
36 ?       00:00:00 ksoftirqd/3  
41 ?       00:00:00 kworker/u11:0-events_unbound  
43 ?       00:00:00 kdevtmpfs  
44 ?       00:00:00 kworker/R-inet  
45 ?       00:00:00 kworker/u9:1-events_unbound
```

```

asd@asd-VirtualBox: ~
asd@asd-VirtualBox:~$ ps -e -f

```

UID	PID	PPID	C	STIME	TTY	TIME	CMD
root	1	0	0	14:05	?	00:00:03	/sbin/init splash
root	2	0	0	14:05	?	00:00:00	[kthreadd]
root	3	2	0	14:05	?	00:00:00	[pool_workqueue_release]
root	4	2	0	14:05	?	00:00:00	[kworker/R-rcu_g]
root	5	2	0	14:05	?	00:00:00	[kworker/R-rcu_p]
root	6	2	0	14:05	?	00:00:00	[kworker/R-slub_]
root	7	2	0	14:05	?	00:00:00	[kworker/R-netns]
root	10	2	0	14:05	?	00:00:00	[kworker/0:0H-kblockd]
root	12	2	0	14:05	?	00:00:00	[kworker/R-mm_pe]
root	13	2	0	14:05	?	00:00:00	[rcu_tasks_kthread]
root	14	2	0	14:05	?	00:00:00	[rcu_tasks_rude_kthread]
root	15	2	0	14:05	?	00:00:00	[rcu_tasks_trace_kthread]
root	16	2	0	14:05	?	00:00:00	[ksoftirqd/0]
root	17	2	0	14:05	?	00:00:01	[rcu_preempt]
root	18	2	0	14:05	?	00:00:00	[migration/0]
root	19	2	0	14:05	?	00:00:00	[idle_inject/0]
root	20	2	0	14:05	?	00:00:00	[cpuhp/0]
root	21	2	0	14:05	?	00:00:00	[cpuhp/1]
root	22	2	0	14:05	?	00:00:00	[idle_inject/1]
root	23	2	0	14:05	?	00:00:00	[migration/1]
root	24	2	0	14:05	?	00:00:00	[ksoftirqd/1]
root	25	2	0	14:05	?	00:00:00	[kworker/1:0-events]
root	27	2	0	14:05	?	00:00:00	[cpuhp/2]
root	28	2	0	14:05	?	00:00:00	[idle_inject/2]
root	29	2	0	14:05	?	00:00:00	[migration/2]
root	30	2	0	14:05	?	00:00:00	[ksoftirqd/2]
root	31	2	0	14:05	?	00:00:00	[kworker/2:0-mm_percpu_wq]
root	32	2	0	14:05	?	00:00:00	[kworker/2:0H-kblockd]
root	33	2	0	14:05	?	00:00:00	[cpuhp/3]
root	34	2	0	14:05	?	00:00:00	[idle_inject/3]
root	35	2	0	14:05	?	00:00:00	[migration/3]
root	36	2	0	14:05	?	00:00:00	[ksoftirqd/3]
root	41	2	0	14:05	?	00:00:00	[kworker/u11:0-events_unbound]
root	43	2	0	14:05	?	00:00:00	[kdevtmpfs]
root	44	2	0	14:05	?	00:00:00	[kworker/R-inet_]
root	45	2	0	14:05	?	00:00:00	[kworker/u9:1-events_unbound]

```

asd@asd-VirtualBox: ~
asd@asd-VirtualBox:~$ ps -e -l

```

F S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
4 S	0	1	0	0	80	0	-	5633	-	?	00:00:03	systemd
1 S	0	2	0	0	80	0	-	0	-	?	00:00:00	kthreadd
1 S	0	3	2	0	80	0	-	0	-	?	00:00:00	pool_workqueue_release
1 I	0	4	2	0	60	-20	-	0	-	?	00:00:00	kworker/R-rcu_g
1 I	0	5	2	0	60	-20	-	0	-	?	00:00:00	kworker/R-rcu_p
1 I	0	6	2	0	60	-20	-	0	-	?	00:00:00	kworker/R-slub
1 I	0	7	2	0	60	-20	-	0	-	?	00:00:00	kworker/R-netns
1 I	0	10	2	0	60	-20	-	0	-	?	00:00:00	kworker/0:0H-kblockd
1 I	0	12	2	0	60	-20	-	0	-	?	00:00:00	kworker/R-mm_pe
1 I	0	13	2	0	80	0	-	0	-	?	00:00:00	rcu_tasks_kthread
1 I	0	14	2	0	80	0	-	0	-	?	00:00:00	rcu_tasks_rude_kthread
1 I	0	15	2	0	80	0	-	0	-	?	00:00:00	rcu_tasks_trace_kthread
1 S	0	16	2	0	80	0	-	0	-	?	00:00:00	ksoftirqd/0
1 I	0	17	2	0	80	0	-	0	-	?	00:00:01	rcu_preempt
1 S	0	18	2	0	-40	-	-	0	-	?	00:00:00	migration/0
1 S	0	19	2	0	9	-	-	0	-	?	00:00:00	idle_inject/0
1 S	0	20	2	0	80	0	-	0	-	?	00:00:00	cpuhp/0
1 S	0	21	2	0	80	0	-	0	-	?	00:00:00	cpuhp/1
1 S	0	22	2	0	9	-	-	0	-	?	00:00:00	idle_inject/1
1 S	0	23	2	0	-40	-	-	0	-	?	00:00:00	migration/1
1 S	0	24	2	0	80	0	-	0	-	?	00:00:00	ksoftirqd/1
1 I	0	25	2	0	80	0	-	0	-	?	00:00:00	kworker/1:0-events
1 S	0	27	2	0	80	0	-	0	-	?	00:00:00	cpuhp/2
1 S	0	28	2	0	9	-	-	0	-	?	00:00:00	idle_inject/2
1 S	0	29	2	0	-40	-	-	0	-	?	00:00:00	migration/2
1 S	0	30	2	0	80	0	-	0	-	?	00:00:00	ksoftirqd/2
1 I	0	31	2	0	80	0	-	0	-	?	00:00:00	kworker/2:0-events
1 I	0	32	2	0	60	-20	-	0	-	?	00:00:00	kworker/2:0H-kblockd
1 S	0	33	2	0	80	0	-	0	-	?	00:00:00	cpuhp/3
1 S	0	34	2	0	9	-	-	0	-	?	00:00:00	idle_inject/3
1 S	0	35	2	0	-40	-	-	0	-	?	00:00:00	migration/3
1 S	0	36	2	0	80	0	-	0	-	?	00:00:00	ksoftirqd/3
5 I	0	41	2	0	80	0	-	0	-	?	00:00:00	kworker/u11:0-events_unbound
5 S	0	43	2	0	80	0	-	0	-	?	00:00:00	kdevtmpfs
1 I	0	44	2	0	60	-20	-	0	-	?	00:00:00	kworker/R-inet
1 I	0	45	2	0	80	0	-	0	-	?	00:00:00	kworker/u9:1-events_unbound



```
asd@asd-VirtualBox: ~  
asd@asd-VirtualBox:~$ ps -A  
PID TTY TIME CMD  
1 ? 00:00:03 systemd  
2 ? 00:00:00 kthreadd  
3 ? 00:00:00 pool_workqueue_release  
4 ? 00:00:00 kworker/R-rcu_g  
5 ? 00:00:00 kworker/R-rcu_p  
6 ? 00:00:00 kworker/R-slub  
7 ? 00:00:00 kworker/R-netns  
10 ? 00:00:00 kworker/0:0H-kblockd  
12 ? 00:00:00 kworker/R-mm_pe  
13 ? 00:00:00 rcu_tasks_kthread  
14 ? 00:00:00 rcu_tasks_rude_kthread  
15 ? 00:00:00 rcu_tasks_trace_kthread  
16 ? 00:00:00 ksoftirqd/0  
17 ? 00:00:01 rcu_preempt  
18 ? 00:00:00 migration/0  
19 ? 00:00:00 idle_inject/0  
20 ? 00:00:00 cpuhp/0  
21 ? 00:00:00 cpuhp/1  
22 ? 00:00:00 idle_inject/1  
23 ? 00:00:00 migration/1  
24 ? 00:00:00 ksoftirqd/1  
25 ? 00:00:00 kworker/1:0-events  
27 ? 00:00:00 cpuhp/2  
28 ? 00:00:00 idle_inject/2  
29 ? 00:00:00 migration/2  
30 ? 00:00:00 ksoftirqd/2  
31 ? 00:00:00 kworker/2:0-events  
32 ? 00:00:00 kworker/2:0H-kblockd  
33 ? 00:00:00 cpuhp/3  
34 ? 00:00:00 idle_inject/3  
35 ? 00:00:00 migration/3  
36 ? 00:00:00 ksoftirqd/3  
41 ? 00:00:00 kworker/u11:0-events_unbound  
43 ? 00:00:00 kdevtmpfs  
44 ? 00:00:00 kworker/R-inet  
45 ? 00:00:00 kworker/u9:1-events_unbound
```

```
asd@asd-VirtualBox:~$ ps aux  
USER PID %CPU %MEM VSZ RSS TTY STAT START TIME COMMAND  
root 1 0.0 0.6 22532 13188 ? Ss 14:05 0:03 /sbin/init splash  
root 2 0.0 0.0 0 0 ? S 14:05 0:00 [kthreadd]  
root 3 0.0 0.0 0 0 ? S 14:05 0:00 [pool_workqueue_release]  
root 4 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/R-rcu_g]  
root 5 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/R-rcu_p]  
root 6 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/R-slub]  
root 7 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/R-netns]  
root 10 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/0:0H-kblockd]  
root 12 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/R-mm_pe]  
root 13 0.0 0.0 0 0 ? I 14:05 0:00 [rcu_tasks_kthread]  
root 14 0.0 0.0 0 0 ? I 14:05 0:00 [rcu_tasks_rude_kthread]  
root 15 0.0 0.0 0 0 ? I 14:05 0:00 [rcu_tasks_trace_kthread]  
root 16 0.0 0.0 0 0 ? S 14:05 0:00 [ksoftirqd/0]  
root 17 0.0 0.0 0 0 ? I 14:05 0:01 [rcu_preempt]  
root 18 0.0 0.0 0 0 ? S 14:05 0:00 [migration/0]  
root 19 0.0 0.0 0 0 ? S 14:05 0:00 [idle_inject/0]  
root 20 0.0 0.0 0 0 ? S 14:05 0:00 [cpuhp/0]  
root 21 0.0 0.0 0 0 ? S 14:05 0:00 [cpuhp/1]  
root 22 0.0 0.0 0 0 ? S 14:05 0:00 [idle_inject/1]  
root 23 0.0 0.0 0 0 ? S 14:05 0:00 [migration/1]  
root 24 0.0 0.0 0 0 ? S 14:05 0:00 [ksoftirqd/1]  
root 25 0.0 0.0 0 0 ? I 14:05 0:00 [kworker/1:0-events]  
root 27 0.0 0.0 0 0 ? S 14:05 0:00 [cpuhp/2]  
root 28 0.0 0.0 0 0 ? S 14:05 0:00 [idle_inject/2]  
root 29 0.0 0.0 0 0 ? S 14:05 0:00 [migration/2]  
root 30 0.0 0.0 0 0 ? S 14:05 0:00 [ksoftirqd/2]  
root 31 0.0 0.0 0 0 ? I 14:05 0:00 [kworker/2:0-events]  
root 32 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/2:0H-kblockd]  
root 33 0.0 0.0 0 0 ? S 14:05 0:00 [cpuhp/3]  
root 34 0.0 0.0 0 0 ? S 14:05 0:00 [idle_inject/3]  
root 35 0.0 0.0 0 0 ? S 14:05 0:00 [migration/3]  
root 36 0.0 0.0 0 0 ? S 14:05 0:00 [ksoftirqd/3]  
root 41 0.0 0.0 0 0 ? I 14:05 0:00 [kworker/u11:0-flush-8:0]  
root 43 0.0 0.0 0 0 ? S 14:05 0:00 [kdevtmpfs]  
root 44 0.0 0.0 0 0 ? I< 14:05 0:00 [kworker/R-inet]  
root 45 0.0 0.0 0 0 ? I 14:05 0:00 [kworker/u9:1-events_unbound]
```

```
asd@asd-VirtualBox: ~  
asd@asd-VirtualBox:~$ ps -e --forest  
PID TTY      TIME CMD  
2 ?        00:00:00 kthreadd  
3 ?        00:00:00 \ pool workqueue_release  
4 ?        00:00:00 \ kworker/R-rcu_g  
5 ?        00:00:00 \ kworker/R-rcu_p  
6 ?        00:00:00 \ kworker/R-slub_  
7 ?        00:00:00 \ kworker/R-netns  
10 ?       00:00:00 \ kworker/0:0H-kblockd  
12 ?       00:00:00 \ kworker/R-mm_pe  
13 ?       00:00:00 \ rcu_tasks_kthread  
14 ?       00:00:00 \ rcu_tasks_rude_kthread  
15 ?       00:00:00 \ rcu_tasks_trace_kthread  
16 ?       00:00:00 \ ksoftirqd/0  
17 ?       00:00:01 \ rcu_preempt  
18 ?       00:00:00 \ migration/0  
19 ?       00:00:00 \ idle_inject/0  
20 ?       00:00:00 \ cpuhp/0  
21 ?       00:00:00 \ cpuhp/1  
22 ?       00:00:00 \ idle_inject/1  
23 ?       00:00:00 \ migration/1  
24 ?       00:00:00 \ ksoftirqd/1  
25 ?       00:00:00 \ kworker/1:0-events  
27 ?       00:00:00 \ cpuhp/2  
28 ?       00:00:00 \ idle_inject/2  
29 ?       00:00:00 \ migration/2  
30 ?       00:00:00 \ ksoftirqd/2  
31 ?       00:00:00 \ kworker/2:0-events  
32 ?       00:00:00 \ kworker/2:0H-kblockd  
33 ?       00:00:00 \ cpuhp/3  
34 ?       00:00:00 \ idle_inject/3  
35 ?       00:00:00 \ migration/3  
36 ?       00:00:00 \ ksoftirqd/3  
41 ?       00:00:00 \ kworker/u11:0-events_unbound  
43 ?       00:00:00 \ kdevtmpfs  
44 ?       00:00:00 \ kworker/R-inet_  
45 ?       00:00:00 \ kworker/u9:1-events_unbound  
46 ?       00:00:00 \ kauditd  
  
asd@asd-VirtualBox:~$ ps -p 1286 -o comm=  
at-spi2-registr  
asd@asd-VirtualBox:~$  
  
asd@asd-VirtualBox:~$ ps aux --sort=-%cpu | head -n 6  
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND  
asd       2452 50.0  0.1  11196 2176 pts/0    S+   15:08   0:00 head -n 6  
asd       2451 33.3  0.2  16516 4736 pts/0    R+   15:08   0:00 ps aux --sort=-%cpu  
asd       1371  3.2 13.2 4845620 266816 ?        Sl   14:05   2:01 cinnamon --replace  
root      871  1.3  9.3 504136 188664 tty7      Ssl+ 14:05   0:49 /usr/lib/xorg/Xorg -core :0 -seat seat0 -auth /var/run/lightdm/r  
oot/:0 -nolisten tcp vt7 -novtswitch  
asd       1704  0.3  2.7 499268 55708 ?        Sl   14:06   0:13 mintreport-tray  
asd@asd-VirtualBox:~$
```

f.) A „free” parancsnak sok kapcsolója van:

- b: Memória használat **byte**-ban.
- k: Memória használat **kilobájtban** (alapértelmezett).
- m: Memória használat **megabájtban**.
- g: Memória használat **gigabájtban**.
- t: RAM és swap terület **összegzett** kijelzése.
- o: "Régi formátum", pufferek és cache nélkül.

**-s:** Folyamatos monitorozás adott időközönként.

**-v:** Csak a **free** verzióját mutatja.

```
asd@asd-VirtualBox: ~  
asd@asd-VirtualBox:~$ free -s  
free: option requires an argument -- 's'  
  
Usage:  
  free [options]  
  
Options:  
  -b, --bytes          show output in bytes  
  --kilo               show output in kilobytes  
  --mega               show output in megabytes  
  --giga               show output in gigabytes  
  --tera               show output in terabytes  
  --peta               show output in petabytes  
  -k, --kibi           show output in kibibytes  
  -m, --mebi           show output in mebibytes  
  -g, --gibi           show output in gibibytes  
  --tebi               show output in tebibytes  
  --pebi               show output in pebibytes  
  -h, --human          show human-readable output  
  --si                 use powers of 1000 not 1024  
  -l, --lohi           show detailed low and high memory statistics  
  -L, --line           show output on a single line  
  -t, --total          show total for RAM + swap  
  -v, --committed     show committed memory and commit limit  
  -s N, --seconds N   repeat printing every N seconds  
  -c N, --count N     repeat printing N times, then exit  
  -w, --wide           wide output  
  
  --help              display this help and exit  
  -V, --version        output version information and exit  
  
For more details see free(1).  
asd@asd-VirtualBox:~$
```