

# **Operációs rendszerek BSc**

**4. Gyak.**

**2022. 03. 01**

**Készítette:**

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PTI

CMU4ZN

**Miskolc, 2022**

## 1.feladat (Linux terminal)

a

```
pe@pe-VirtualBox: ~  
File Edit View Search Terminal Help  
top - 15:05:00 up 3 min, 1 user, load average: 0,28, 0,63, 0,30  
Tasks: 165 total, 1 running, 164 sleeping, 0 stopped, 0 zombie  
%Cpu(s): 2,0 us, 0,2 sy, 0,0 ni, 97,8 id, 0,0 wa, 0,0 hi, 0,0 si, 0,0 st  
MiB Mem : 1987,5 total, 884,3 free, 605,8 used, 497,4 buff/cache  
MiB Swap: 923,3 total, 923,3 free, 0,0 used. 1215,1 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
1090	pe	20	0	3826796	201600	121280	S	3,3	9,9	0:08.70	cinnamon
749	root	20	0	902952	91992	55836	S	0,7	4,5	0:01.52	Xorg
608	kernoops	20	0	11256	448	0	S	0,3	0,0	0:00.01	kernelo+
1385	pe	20	0	467192	40128	31408	S	0,3	2,0	0:00.35	gnome-t+
1413	pe	20	0	14728	4004	3500	R	0,3	0,2	0:00.03	top
1	root	20	0	101692	11116	8192	S	0,0	0,5	0:02.37	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+
5	root	20	0	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	20	0	0	0	0	I	0,0	0,0	0:00.12	kworker+
8	root	20	0	0	0	0	I	0,0	0,0	0:00.01	kworker+
9	root	0	-20	0	0	0	I	0,0	0,0	0:00.00	mm_perc+
10	root	20	0	0	0	0	S	0,0	0,0	0:00.05	ksoftir+
11	root	20	0	0	0	0	I	0,0	0,0	0:00.15	rcu_sch+
12	root	rt	0	0	0	0	S	0,0	0,0	0:00.00	migrati+

b

```
pe@pe-VirtualBox:~$ vmstat -m  
vmstat: your kernel does not support slabinfo or your permissions are insufficient  
pe@pe-VirtualBox:~$ vmstat 3  
procs -----memory----- ---swap-- -----io----- -system-- -----cpu-----  
r b swpd free buff cache si so bi bo in cs us sy id wa st  
0 0 0 904484 35912 473520 0 0 655 45 119 200 6 3 85 7 0  
2 0 0 904232 35924 473572 0 0 8 0 166 331 11 0 87 1 0
```

c

```
pe@pe-VirtualBox:~$ w  
15:09:25 up 7 min, 1 user, load average: 0,14, 0,32, 0,25  
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT  
pe tty7 :0 15:01 7:43 3.12s 0.90s cinnamon-session
```

d

```
pe@pe-VirtualBox:~$ who  
pe tty7 2022-03-01 15:01 (:0)
```

e

```
pe@pe-VirtualBox:~$ ps  
PID TTY TIME CMD  
1437 pts/0 00:00:00 bash  
1452 pts/0 00:00:00 ps
```

```
pe@pe-VirtualBox:~$ ps -A
```

```
PID TTY          TIME CMD
  1 ?           00:00:02 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-kblockd
  7 ?           00:00:00 kworker/0:1-events
  8 ?           00:00:00 kworker/u4:0-events_unbound
  9 ?           00:00:00 mm_percpu_wq
 10 ?           00:00:00 ksoftirqd/0
 11 ?           00:00:00 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
```

```
pe@pe-VirtualBox:~$ ps -Al
```

F	S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	TTY	TIME	CMD
4	S	0	1	0	0	80	0	- 25423	-	-	?	00:00:02	systemd
1	S	0	2	0	0	80	0	-	0	-	?	00:00:00	kthreadd
1	I	0	3	2	0	60	-20	-	0	-	?	00:00:00	rcu_gp
1	I	0	4	2	0	60	-20	-	0	-	?	00:00:00	rcu_par_gp
1	I	0	6	2	0	60	-20	-	0	-	?	00:00:00	kworker/0:0H
1	I	0	7	2	0	80	0	-	0	-	?	00:00:00	kworker/0:1-
1	I	0	8	2	0	80	0	-	0	-	?	00:00:00	kworker/u4:0
1	I	0	9	2	0	60	-20	-	0	-	?	00:00:00	mm_percpu_wq
1	S	0	10	2	0	80	0	-	0	-	?	00:00:00	ksoftirqd/0
1	I	0	11	2	0	80	0	-	0	-	?	00:00:00	rcu_sched
1	S	0	12	2	0	-40	-	-	0	-	?	00:00:00	migration/0
5	S	0	13	2	0	9	-	-	0	-	?	00:00:00	idle_inject/
1	S	0	14	2	0	80	0	-	0	-	?	00:00:00	cpuhp/0
1	S	0	15	2	0	80	0	-	0	-	?	00:00:00	cpuhp/1
5	S	0	16	2	0	9	-	-	0	-	?	00:00:00	idle_inject/
1	S	0	17	2	0	-40	-	-	0	-	?	00:00:00	migration/1
1	S	0	18	2	0	80	0	-	0	-	?	00:00:00	ksoftirqd/1
1	I	0	20	2	0	60	-20	-	0	-	?	00:00:00	kworker/1:0H

```
pe@pe-VirtualBox:~$ ps -AlFH
```

F	S	UID	PID	PPID	C	PRI	NI	ADDR	SZ	WCHAN	RSS	PSR	STIME	TTY
1	S	root	2	0	0	80	0	-	0	-	0	0	15:01	?
:00:00 [kthreadd]														
1	I	root	3	2	0	60	-20	-	0	-	0	0	15:01	?
:00:00 [rcu_gp]														
1	I	root	4	2	0	60	-20	-	0	-	0	0	15:01	?
:00:00 [rcu_par_gp]														
1	I	root	6	2	0	60	-20	-	0	-	0	0	15:01	?
:00:00 [kworker/0:0H-kblockd]														
1	I	root	7	2	0	80	0	-	0	-	0	0	15:01	?
:00:00 [kworker/0:1-events]														
1	I	root	8	2	0	80	0	-	0	-	0	0	15:01	?
:00:00 [kworker/u4:0-events_unbound]														
1	I	root	9	2	0	60	-20	-	0	-	0	0	15:01	?
:00:00 [mm_percpu_wq]														
1	S	root	10	2	0	80	0	-	0	-	0	0	15:01	?
:00:00 [ksoftirqd/0]														

pe@pe-VirtualBox:~\$ 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]
6	?	I<	0:00	[kworker/0:0H-kblockd]
7	?	I	0:00	[kworker/0:1-events]
8	?	I	0:00	[kworker/u4:0-events_power_efficient]
9	?	I<	0:00	[mm_percpu_wq]
10	?	S	0:00	[ksoftirqd/0]
11	?	I	0:00	[rcu_sched]
12	?	S	0:00	[migration/0]
13	?	S	0:00	[idle_inject/0]
14	?	S	0:00	[cpuhp/0]
15	?	S	0:00	[cpuhp/1]
16	?	S	0:00	[idle_inject/1]
17	?	S	0:00	[migration/1]
18	?	S	0:00	[ksoftirqd/1]
20	?	I<	0:00	[kworker/1:0H-kblockd]
21	?	S	0:00	[kdevtmpfs]

pe@pe-VirtualBox:~\$ ps aux

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	1	0.2	0.5	101692	11116	?	Ss	15:01	0:02	/sbin/init spla
root	2	0.0	0.0	0	0	?	S	15:01	0:00	[kthreadd]
root	3	0.0	0.0	0	0	?	I<	15:01	0:00	[rcu_gp]
root	4	0.0	0.0	0	0	?	I<	15:01	0:00	[rcu_par_gp]
root	6	0.0	0.0	0	0	?	I<	15:01	0:00	[kworker/0:0H-k
root	7	0.0	0.0	0	0	?	I	15:01	0:00	[kworker/0:1-ev
root	8	0.0	0.0	0	0	?	I	15:01	0:00	[kworker/u4:0-e
root	9	0.0	0.0	0	0	?	I<	15:01	0:00	[mm_percpu_wq]
root	10	0.0	0.0	0	0	?	S	15:01	0:00	[ksoftirqd/0]
root	11	0.0	0.0	0	0	?	I	15:01	0:00	[rcu_sched]
root	12	0.0	0.0	0	0	?	S	15:01	0:00	[migration/0]
root	13	0.0	0.0	0	0	?	S	15:01	0:00	[idle_inject/0]
root	14	0.0	0.0	0	0	?	S	15:01	0:00	[cpuhp/0]
root	15	0.0	0.0	0	0	?	S	15:01	0:00	[cpuhp/1]
root	16	0.0	0.0	0	0	?	S	15:01	0:00	[idle_inject/1]
root	17	0.0	0.0	0	0	?	S	15:01	0:00	[migration/1]
root	18	0.0	0.0	0	0	?	S	15:01	0:00	[ksoftirqd/1]
root	20	0.0	0.0	0	0	?	I<	15:01	0:00	[kworker/1:0H-k
root	21	0.0	0.0	0	0	?	S	15:01	0:00	[kdevtmpfs]
root	22	0.0	0.0	0	0	?	I<	15:01	0:00	[netns]
root	23	0.0	0.0	0	0	?	S	15:01	0:00	[rcu_tasks_kthr

```

pe@pe-VirtualBox:~$ pstree
systemd--ModemManager--2*[{ModemManager}]
        |NetworkManager--2*[{NetworkManager}]
        |accounts-daemon--2*[{accounts-daemon}]
        |acpid
        |agetty
        |avahi-daemon--avahi-daemon
        |colord--2*[{colord}]
        |cron
        |csd-printer--2*[{csd-printer}]
        |cups-browsed--2*[{cups-browsed}]
        |cupsd
        |dbus-daemon
        |gnome-keyring-d--3*[{gnome-keyring-d}]
        |irqbalance--{irqbalance}
        |2*[{kerneloops}]
        |lightdm--Xorg--9*[{Xorg}]
        |   |lightdm--cinnamon-session--agent--2*[{agent}]

```

```

pe@pe-VirtualBox:~$ ps -p 10 -o comm=
ksoftirqd/0

```

```

pe@pe-VirtualBox:~$ ps -auxf | sort -nr -k 3 | head -5
pe      1090  6.3  9.9 3827236 202964 ?        Sl   15:02   1:13      |  \_
cinnamon --replace
root    749   0.6  4.6 905696 94772 tty7      Ssl+ 15:01   0:08  \_ /usr/lib/xo
rg/Xorg -core :0 -seat seat0 -auth /var/run/lightdm/root/:0 -nolisten tcp vt7 -nov
tswitch
pe      1429  0.4  1.9 541084 40400 ?        Ssl   15:08   0:03  \_ /usr/libexe
c/gnome-terminal-server
root     1    0.2  0.5 101692 11116 ?        Ss    15:01   0:02 /sbin/init spla
sh
root    335   0.1  0.3 24104 7688 ?         Ss    15:01   0:01 /lib/systemd/sy
stemd-udev

```

f

```

pe@pe-VirtualBox:~$ free
              total        used         free       shared  buff/cache   available
Mem:         2035232        628388        888888         20232       517956     1233608
Swap:         945416           0         945416
pe@pe-VirtualBox:~$ free -b
              total        used         free       shared  buff/cache   available
Mem:      2084077568     643489792     910163968     20717568     530423808     1263202304
Swap:     968105984           0     968105984
pe@pe-VirtualBox:~$ free -k
              total        used         free       shared  buff/cache   available
Mem:         2035232        628580        888612         20232       518040     1233420
Swap:         945416           0         945416
pe@pe-VirtualBox:~$ free -g
              total        used         free       shared  buff/cache   available
Mem:             1           0           0           0           0           1
Swap:            0           0           0
pe@pe-VirtualBox:~$ free -m
              total        used         free       shared  buff/cache   available
Mem:           1987          613          867          19          505         1204
Swap:           923           0          923
pe@pe-VirtualBox:~$ free -t
              total        used         free       shared  buff/cache   available
Mem:         2035232        628792        888368         20232       518072     1233184
Swap:         945416           0         945416
Total:       2980648        628792       1833784

```

```

pe@pe-VirtualBox:~$ free -s 1
              total        used        free      shared  buff/cache   available
Mem:           2035232      630724      886360         2032       518148      1231276
Swap:           945416           0       945416

              total        used        free      shared  buff/cache   available
Mem:           2035232      630724      886360         2032       518148      1231276
Swap:           945416           0       945416

              total        used        free      shared  buff/cache   available
Mem:           2035232      630724      886360         2032       518148      1231276
Swap:           945416           0       945416
pe@pe-VirtualBox:~$ free -V
free from procs-ng 3.3.16

```

g

```

pe@pe-VirtualBox:~$ iostat -c
Linux 5.4.0-91-generic (pe-VirtualBox)  03/01/2022      _x86_64_      (2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,61    0,00    1,25    1,71    0,00   92,43

pe@pe-VirtualBox:~$ iostat
Linux 5.4.0-91-generic (pe-VirtualBox)  03/01/2022      _x86_64_      (2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,66    0,00    1,28    1,76    0,00   92,31

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_w
rtn    kB_dscd
sda              9,80        284,43         58,62         0,00       581651      119
865              0
pe@pe-VirtualBox:~$ iostat -d
Linux 5.4.0-91-generic (pe-VirtualBox)  03/01/2022      _x86_64_      (2 CPU)

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_w
rtn    kB_dscd
sda              9,43        272,17         56,36         0,00       581651      120
441              0
pe@pe-VirtualBox:~$ iostat -h
Linux 5.4.0-91-generic (pe-VirtualBox)  03/01/2022      _x86_64_      (2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,5%    0,0%    1,2%    1,6%    0,0%   92,7%

      tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dsc
d Device
      9,11        261,8k         54,4k         0,0k       568,0M       118,1M       0,0
k sda
pe@pe-VirtualBox:~$ iostat -N
Linux 5.4.0-91-generic (pe-VirtualBox)  03/01/2022      _x86_64_      (2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,53    0,00    1,21    1,67    0,00   92,60

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_w
rtn    kB_dscd
sda              9,26        266,66         55,33         0,00       581651      120
697              0

```



```

pe@pe-VirtualBox:~$ iostat -k
Linux 5.4.0-91-generic (pe-VirtualBox) 03/01/2022 _x86_64_ (2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,45    0,00    1,17    1,61    0,00   92,76

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn
rtn      kB_dscd
sda      8,94      256,78      53,44         0,00     581651     121045
045      0

pe@pe-VirtualBox:~$ iostat -t
Linux 5.4.0-91-generic (pe-VirtualBox) 03/01/2022 _x86_64_ (2 CPU)

03/01/2022 03:40:03 PM
avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,39    0,00    1,15    1,59    0,00   92,88

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn
rtn      kB_dscd
sda      8,77      251,05      52,39         0,00     581651     121369
369      0

pe@pe-VirtualBox:~$ iostat -V
sysstat version 12.2.0
(C) Sebastien Godard (sysstat <at> orange.fr)

pe@pe-VirtualBox:~$ iostat -x
Linux 5.4.0-91-generic (pe-VirtualBox) 03/01/2022 _x86_64_ (2 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           4,34    0,00    1,12    1,55    0,00   92,98

Device            r/s    rkB/s    rrqm/s    %rrqm    r_await    rareq-sz    w/s    wkB
/s    wrqm/s    %wrqm    w_await    wareq-sz    d/s    dKB/s    drqm/s    %drqm    d_await    da
req-sz    aqu-sz    %util
sda      6,89      244,51      4,10    37,33      9,32      35,51      1,67      51,
12      3,17    65,42      9,07      30,56      0,00      0,00      0,00      0,00      0,00
0,00      0,07      3,92

```

h

```

pe@pe-VirtualBox:~$ sar -n dev | more
Usage: sar [ options ] [ <interval> [ <count> ] ]
Options are:
[ -A ] [ -B ] [ -b ] [ -C ] [ -D ] [ -d ] [ -F [ MOUNT ] ] [ -H ] [ -h ]
[ -p ] [ -q ] [ -r [ ALL ] ] [ -S ] [ -t ] [ -u [ ALL ] ] [ -V ]
[ -v ] [ -W ] [ -w ] [ -y ] [ -z ]
[ -I { <int_list> | SUM | ALL } ] [ -P { <cpu_list> | ALL } ]
[ -m { <keyword> [,...] | ALL } ] [ -n { <keyword> [,...] | ALL } ]
[ --dev=<dev_list> ] [ --fs=<fs_list> ] [ --iface=<iface_list> ]
[ --dec={ 0 | 1 | 2 } ] [ --help ] [ --human ] [ --sadc ]
[ -j { SID | ID | LABEL | PATH | UUID | ... } ]
[ -f [ <filename> ] | -o [ <filename> ] | -[0-9]+ ]
[ -i <interval> ] [ -s [ <hh:mm[:ss]> ] ] [ -e [ <hh:mm[:ss]> ] ]

```

i

```

pe@pe-VirtualBox:~$ mpstat
Linux 5.4.0-91-generic (pe-VirtualBox) 03/01/2022 _x86_64_ (2 CPU)

03:47:38 PM CPU    %usr   %nice    %sys %iowait    %irq   %soft  %steal  %guest
      %gnice   %idle
03:47:38 PM all     4,06    0,00    0,91    1,37    0,00    0,07    0,00    0,00
      0,00   93,59

```

j

```
pe@pe-VirtualBox:~$ pmap -d 10
10: [ksoftirqd/0]
Address          Kbytes Mode  Offset          Device    Mapping
mapped: 0K      writeable/private: 0K   shared: 0K
```

## 2.Feladat (Powershell)

1

```
PS C:\Users\patx5> $PSVersionTable

Name                           Value
----                           -
PSVersion                      5.1.19041.1320
PSEdition                      Desktop
PSCompatibleVersions           {1.0, 2.0, 3.0, 4.0...}
BuildVersion                   10.0.19041.1320
CLRVersion                     4.0.30319.42000
WSManStackVersion              3.0
PSRemotingProtocolVersion      2.3
SerializationVersion           1.1.0.1
```

2

```
PS C:\Users\patx5> Get-Date

2022. március 1., kedd 15:56:58
```

3

```
PS C:\Users\patx5> Get-Service

Status  Name                DisplayName
-----  -
Stopped AarSvc_220d90c4     Agent Activation Runtime_220d90c4
Stopped AJRouter          AllJoyn-útválasztó szolgáltatás
Stopped ALG           Alkalmazási réteg átjárószolgáltatása
Stopped AppIDSvc       Alkalmazásidentitás
Running Appinfo          Alkalmazásinformációk
Stopped AppMgmt        Alkalmazásvezérlés
Stopped AppReadiness   Alkalmazás-előkészítő
Stopped AppVClient     Microsoft App-V Client
Running AppXSvc        AppX Deployment Service (AppXSVC)
Stopped AssignedAccessM... AssignedAccessManager szolgáltatás
Running AudioEndpointBu... Windows-hangvégpontépítő
Running Audiosrv       Windows audio
Stopped autotimesvc     Mobilhálózati idő
```



4

```
PS C:\> ls
```

```
Directory: C:\
```

Mode		LastWriteTime	Length	Name
----		-----	-----	----
da----	2022. 02. 23.	17:40		adb
d-----	2022. 02. 23.	18:09		GameSSD
d-----	2021. 05. 13.	10:55		obsfelvetel
d-----	2019. 12. 07.	10:14		PerfLogs
d-----	2021. 10. 30.	10:07		platform-tools
d-r---	2022. 02. 24.	14:05		Program Files
d-r---	2022. 02. 07.	21:30		Program Files (x86)
d-----	2021. 12. 24.	10:23		Riot Games
d-r---	2021. 04. 24.	16:01		Users
d-----	2022. 02. 12.	13:53		Windows
-a----	2021. 10. 29.	15:10	0	MiFlashvcom.ini

5

```
PS C:\> Get-Alias
```

CommandType	Name
Alias	% -> ForEach-Object
Alias	? -> Where-Object
Alias	ac -> Add-Content
Alias	asnp -> Add-PSSnapin
Alias	cat -> Get-Content
Alias	cd -> Set-Location
Alias	CFS -> ConvertFrom-String
Alias	chdir -> Set-Location
Alias	clc -> Clear-Content
Alias	clear -> Clear-Host
Alias	clhy -> Clear-History
Alias	cli -> Clear-Item
Alias	clp -> Clear-ItemProperty
Alias	cls -> Clear-Host
Alias	clv -> Clear-Variable
Alias	cnsn -> Connect-PSSession
Alias	compare -> Compare-Object
Alias	copy -> Copy-Item
Alias	cp -> Copy-Item
Alias	cpi -> Copy-Item
Alias	cpp -> Copy-ItemProperty
Alias	curl -> Invoke-WebRequest
Alias	cvpa -> Convert-Path
Alias	dbp -> Disable-PSBreakpoint
Alias	del -> Remove-Item
Alias	diff -> Compare-Object
Alias	dir -> Get-ChildItem
Alias	dnsn -> Disconnect-PSSession

6

```
PS C:\> New-Alias "processz" Get-Process
```

7

```
PS C:\> Get-Service | ft name,status
```

Name	Status
----	-----
AarSvc_220d90c4	Stopped
AJRouter	Stopped
ALG	Stopped
AppIDSvc	Stopped
Appinfo	Running
AppMgmt	Stopped
AppReadiness	Stopped
AppVClient	Stopped
AppXSvc	Running
AssignedAccessManagerSvc	Stopped
AudioEndpointBuilder	Running
Audiosrv	Running
autotimesvc	Stopped
AxInstSV	Stopped
BcastDVRUserService_220d90c4	Stopped
BDESVC	Stopped
BFE	Running
BITS	Stopped

8

```
PS C:\> processz | Sort-Object name
```

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	-----	--	--	-----
408	22	17500	34460	8,83	4844	28	ApplicationFrameHost
152	8	1616	1692		14308	0	AppVShNotify
174	10	6608	12796	2,22	13744	0	audiodg
106	7	6328	1260	0,14	14368	28	conhost
281	14	4832	19464	4,16	8976	28	conhost
103	7	6240	1376		3700	0	conhost
448	17	4456	21316	5,13	6032	28	ctfmon
521	20	2428	6040		8708	28	csrss
711	26	2108	2976		604	0	csrss
2054	36	19068	25220		3960	0	DAX3API
171	8	2268	9500		656	28	DAX3API
201	13	2696	12100	0,14	20028	28	dllhost
208	17	3780	6028		13004	0	dllhost
96	7	1340	5892		9188	28	DSRHost

9

```
PS C:\> processz | Where-Object { $_.name -eq "wi" }
```

10

```
PS C:\> Get-Service | Group-Object status
```

Count	Name	Group
-----	-----	-----
163	Stopped	{AarSvc_220d90c4, AJRouter, ALG, AppIDSvc...}
122	Running	{Appinfo, AppXSvc, AudioEndpointBuilder, Audiosrv...}

## 11-12

```
PS C:\> Get-Service | Measure-Object
```

```
Count      : 285
Average    :
Sum        :
Maximum    :
Minimum    :
Property   :
```

## 13

```
PS C:\Users\patx5> Get-CimInstance -ClassName Win32_OperatingSystem | Select LastBootUpTime
LastBootUpTime
-----
2022. 02. 13. 13:20:25
```

## 14

```
PS D:\Suli\OS\2022.03.01> $szoveg = 'Miskolc'
```

## 15

```
PS D:\Suli\OS\2022.03.01> "szoveg".ToUpper()
SZOVEG
```

```
PS D:\Suli\OS\2022.03.01> "szoveg".Length
6
```

```
PS D:\Suli\OS\2022.03.01> "szoveg".Contains
```

```
OverloadDefinitions
```

```
-----
```

```
bool Contains(string value)
```

```
PS D:\Suli\OS\2022.03.01> "szoveg".Split
```

```
OverloadDefinitions
```

```
-----
```

```
string[] Split(Params char[] separator)
```

```
string[] Split(char[] separator, int count)
```

```
string[] Split(char[] separator, System.StringSplitOptions options)
```

```
string[] Split(char[] separator, int count, System.StringSplitOptions options)
```

```
string[] Split(string[] separator, System.StringSplitOptions options)
```

```
string[] Split(string[] separator, int count, System.StringSplitOptions options)
```

```
PS D:\Suli\OS\2022.03.01> "szoveg".Replace
```

```
OverloadDefinitions
```

```
-----
```

```
string Replace(char oldChar, char newChar)
```

```
string Replace(string oldValue, string newValue)
```

16

```
PS D:\Suli\OS\2022.03.01> Set-Content CMU4ZN.txt 'Csonka Patrik'
```

```
PS D:\Suli\OS\2022.03.01> Get-Content CMU4ZN.txt
```

```
Csonka Patrik
```

```
PS D:\Suli\OS\2022.03.01> Get-ItemProperty CMU4ZN.txt
```

```
Directory: D:\Suli\OS\2022.03.01
```

Mode		LastWriteTime	Length	Name
----		-----	-----	----
-a----	2022. 03. 06.	17:43	15	CMU4ZN.txt