

Operációs rendszerek BSc

4. Gyak.

2022. 02. 28.

Készítette:

Zavarkó Máté

Gazdasági Informatikus

IN3BLK

Miskolc, 2022

I. Téma: Linux OS parancsok

a) Feladat:

Futó processzek listája

```
top - 20:59:45 up 15 min, 1 user, load average: 0,10, 0,08, 0,02
Tasks: 182 total, 1 running, 181 sleeping, 0 stopped, 0 zombie
%Cpu(s): 0,2 us, 0,2 sy, 0,0 ni, 99,7 id, 0,0 wa, 0,0 hi, 0,0 si, 0,0 st
MiB Mem : 3935,7 total, 2135,1 free, 627,4 used, 1173,3 buff/cache
MiB Swap: 1208,6 total, 1208,6 free, 0,0 used, 3039,5 avail Mem

  PID USER      PR  NI  VIRT  RES  SHR S %CPU  %MEM    TIME+  COMMAND
 1317 zmate     20   0 3882144 156348 94780 S  2,0   3,9   0:06.53 cinnamon
  933 root      20   0 394248  92888 54524 S  0,7   2,3   0:04.17 Xorg
    1 root      20   0 167236  11408  8408 S  0,0   0,3   0:00.76 systemd
    2 root      20   0      0      0      0 S  0,0   0,0   0:00.00 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-kblockd
    7 root      20   0      0      0      0 I  0,0   0,0   0:00.01 kworker/0:1-cgroup_destroy
    9 root      0 -20      0      0      0 I  0,0   0,0   0:00.00 mm_percpu_wq
   10 root      20   0      0      0      0 S  0,0   0,0   0:00.01 ksoftirqd/0
   11 root      20   0      0      0      0 I  0,0   0,0   0:00.19 rcu_sched
   12 root      rt    0      0      0      0 S  0,0   0,0   0:00.00 migration/0
   13 root     -51   0      0      0      0 S  0,0   0,0   0:00.00 idle_inject/0
   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
   16 root     -51   0      0      0      0 S  0,0   0,0   0:00.00 idle_inject/1
   17 root      rt    0      0      0      0 S  0,0   0,0   0:00.24 migration/1
   18 root      20   0      0      0      0 S  0,0   0,0   0:00.01 ksoftirqd/1
   20 root      0 -20      0      0      0 I  0,0   0,0   0:00.00 kworker/1:0H-kblockd
   21 root      20   0      0      0      0 S  0,0   0,0   0:00.00 cpuhp/2
   22 root     -51   0      0      0      0 S  0,0   0,0   0:00.00 idle_inject/2
   23 root      rt    0      0      0      0 S  0,0   0,0   0:00.23 migration/2
   24 root      20   0      0      0      0 S  0,0   0,0   0:00.01 ksoftirqd/2
   26 root      0 -20      0      0      0 I  0,0   0,0   0:00.00 kworker/2:0H-kblockd
   27 root      20   0      0      0      0 S  0,0   0,0   0:00.00 cpuhp/3
```

b) Feladat:

Rendszer aktivitása és hardverinformációk

```
zmate@zmate-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
 2 0      0 2187700 110776 1090704 0 0 277 65 110 157 1 0 99 0 0

zmate@zmate-VirtualBox:~$ vmstat -m
vmstat: your kernel does not support slabinfo or your permissions are insufficient

zmate@zmate-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
 1 0      0 2190420 535520 1063640 0 0 271 63 109 155 1 0 99 0 0
```

c) Feladat:

Ki van bejelentkezve

```
zmate@zmate-VirtualBox:~$ w
 21:04:18 up 19 min, 1 user, load average: 0,00, 0,04, 0,01
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU WHAT
zmate     tty7      :0            20:44    19:38  4.36s  0.29s cinnamon-session --session cinnamon
```

d) Feladat:

Szerver futásának kezdő ideje

```
zmate@zmate-VirtualBox:~$ uname
Linux
zmate@zmate-VirtualBox:~$ uname -a
Linux zmate-VirtualBox 5.4.0-91-generic #102-Ubuntu SMP Fri Nov 5 16:31:28 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
```

e) Feladat:

ps – processzekről jelentést készít

```
zmate@zmate-VirtualBox:~$ ps -a
PID TTY          TIME CMD
2507 pts/0      00:00:00 ps

zmate@zmate-VirtualBox:~$ ps -Alf
F S UID          PID     PPID    C  PRI   NI     ADDR  SZ  WCHAN    STIME TTY          TIME CMD
4 S root           1         0    0   80    0     -  41809   -          20:44 ?           00:00:00 /sbin/init splash
1 S root           2         0    0   80    0     -    -    -          20:44 ?           00:00:00 [kthreadd]
1 I root           3         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [rcu_gp]
1 I root           4         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [rcu_par_gp]
1 I root           6         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [kworker/0:0H-kblockd]

zmate@zmate-VirtualBox:~$ ps -AlFH
F S UID          PID     PPID    C  PRI   NI     ADDR  SZ  WCHAN    STIME TTY          TIME CMD
1 S root           2         0    0   80    0     -    -    -          20:44 ?           00:00:00 [kthreadd]
1 I root           3         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [rcu_gp]
1 I root           4         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [rcu_par_gp]
1 I root           6         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [kworker/0:0H-kblockd]
1 I root           9         2    0   60   -20   -    -    -          20:44 ?           00:00:00 [mm_percpu_wq]
1 S root          10         2    0   80    0     -    -    -          20:44 ?           00:00:00 [ksoftirqd/0]
1 I root          11         2    0   80    0     -    -    -          20:44 ?           00:00:00 [rcu_sched]
1 S root          12         2    0   80    0     -    -    -          20:44 ?           00:00:00 [migration/0]

zmate@zmate-VirtualBox:~$ ps ax
      PID TTY          STAT       TIME COMMAND
      1 ?           Ss          0:00 /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]
      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]

zmate@zmate-VirtualBox:~$ ps axu
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.2 167236 11408 ?        Ss   20:44    0:00 /sbin/init splash
root         2  0.0  0.0      0     0 ?        S    20:44    0:00 [kthreadd]
root         3  0.0  0.0      0     0 ?        I<   20:44    0:00 [rcu_gp]
root         4  0.0  0.0      0     0 ?        I<   20:44    0:00 [rcu_par_gp]
root         6  0.0  0.0      0     0 ?        I<   20:44    0:00 [kworker/0:0H-kblockd]
root         9  0.0  0.0      0     0 ?        I<   20:44    0:00 [mm_percpu_wq]
root        10  0.0  0.0      0     0 ?        S    20:44    0:00 [ksoftirqd/0]
root        11  0.0  0.0      0     0 ?        I    20:44    0:00 [rcu_sched]
root        12  0.0  0.0      0     0 ?        S    20:44    0:00 [migration/0]
root        13  0.0  0.0      0     0 ?        S    20:44    0:00 [idle_inject/0]
```

```

zmate@zmate-VirtualBox:~$ pstree
systemd─ModemManager─2*[{ModemManager}]
        │
        └─NetworkManager─2*[{NetworkManager}]
            │
            └─3*[VBoxClient─VBoxClient─2*[{VBoxClient}]]
                │
                └─VBoxClient─VBoxClient─3*[{VBoxClient}]
                    │
                    └─VBoxService─8*[{VBoxService}]
                        │
                        └─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}]

```

```

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

```

```

zmate@zmate-VirtualBox:~$ ps -auxf | sort -nr -k 3 | head -5
zmate 1317 0.4 3.8 3882144 156120 ?        Sl   20:44   0:08      | \ cinnamon --replace
root   933  0.4 2.3 394248 92888 tty7      Ssl+ 20:44   0:08 \_ /usr/lib/xorg/Xorg -core :0 -seat seat0 -auth /var/run/lightdm/root/:0 -nolis
ten tcp vt7 -novtswitch
zmate 2365 0.2 1.0 468864 41704 ?        Ssl   20:57   0:02 \_ /usr/libexec/gnome-terminal-server
zmate 1018 0.1 0.0 158240 2764 ?        Sl    20:44   0:02 \_ /usr/bin/VBoxClient --draganddrop
root   2459 0.1 1.9 438572 77020 ?        Ssl   21:03   0:00 /usr/libexec/fwupd/fwupd

```

f) Feladat:

fizikai memória és a swap által használt és szabad terület

```

zmate@zmate-VirtualBox:~$ free
              total        used         free       shared    buff/cache   available
Mem:           4030168       708532       2053284         17164       1268352       3040588
Swap:          1237624           0        1237624

```

g) Feladat:

Átlagos CPU terhelést vagy lemez aktivitás

```

zmate@zmate-VirtualBox:~$ iostat
Linux 5.4.0-91-generic (zmate-VirtualBox)      2022-02-28      _x86_64_      (4 CPU)

avg-cpu:  %user   %nice %system %iowait  %steal   %idle
           0,49    0,00    0,29    0,06    0,00   99,16

Device            tps    kB_read/s    kB_wrtn/s    kB_dscd/s    kB_read    kB_wrtn    kB_dscd
sda                21,78        548,43        208,86         0,00    1099123    418577         0
sdd0               0,03         0,11         0,00         0,00         228         0         0

```

h) Feladat:

Aktivitási adatok jelzése és összegyűjtése, mentés

```

zmate@zmate-VirtualBox:~$ sar
/var/log/sysstat/sa28 nem nyitható meg: Nincs ilyen fájl vagy könyvtár
Ellenőrizze, hogy az adatgyűjtés engedélyezve van-e

```

i) Feladat:

Több processzoros számítógép esetén használják

```

zmate@zmate-VirtualBox:~$ mpstat
Linux 5.4.0-91-generic (zmate-VirtualBox)      2022-02-28      _x86_64_      (4 CPU)

21:19:17   CPU   %usr   %nice    %sys %iowait  %irq   %soft  %steal  %guest  %gnice   %idle
21:19:17   all    0,49    0,00    0,25    0,06    0,00    0,02    0,00    0,00    0,00   99,18

```

j) Feladat:

Processz memória használatát jelzi

```
zmate@zmate-VirtualBox:~$ pmap
```

Usage:

```
pmap [options] PID [PID ...]
```

Options:

```
-x, --extended          show details
-X                      show even more details
                        WARNING: format changes according to /proc/PID/smaps
-XX                    show everything the kernel provides
-c, --read-rc           read the default rc
-C, --read-rc-from=<file> read the rc from file
-n, --create-rc         create new default rc
-N, --create-rc-to=<file> create new rc to file
                        NOTE: pid arguments are not allowed with -n, -N
-d, --device           show the device format
-q, --quiet            do not display header and footer
-p, --show-path        show path in the mapping
-A, --range=<low>[,<high>] limit results to the given range

-h, --help            display this help and exit
-V, --version         output version information and exit
```

For more details see pmap(1).

II. Téma: Windows OS - PowerShell

1. Feladat:

PowerShellVerzió

```
PS C:\Users\TEMP.IIT.003> $PSVersionTable

Name                           Value
----                           -
PSVersion                      5.1.17134.858
PSEdition                      Desktop
PSCompatibleVersions           {1.0, 2.0, 3.0, 4.0...}
BuildVersion                   10.0.17134.858
CLRVersion                     4.0.30319.42000
WSManStackVersion              3.0
PSRemotingProtocolVersion      2.3
SerializationVersion           1.1.0.1
```

2. Feladat:

Mai dátum

```
PS C:\Users\TEMP.IIT.003> Get-Date

2022. február 28., hétfő 17:02:23
```

3. Feladat:

Szolgáltatások

```
PS C:\Users\TEMP.IIT.003> Get-Service

Status  Name                DisplayName
-----  -
Running AdobeARMservice    Adobe Acrobat Update Service
Stopped AJRouter       AllJoyn Router Service
Stopped ALG           Application Layer Gateway Service
Stopped AppIDSvc       Application Identity
Running Appinfo        Application Information
Stopped AppMgmt        Application Management
Running AppReadiness   App Readiness
Stopped AppVClient     Microsoft App-V Client
Running AppXSvc        AppX Deployment Service (AppXSVC)
Stopped aspnet_state   ASP.NET State Service
Stopped AssignedAccessM... AssignedAccessManager Service
Running AudioEndpointBu... Windows Audio Endpoint Builder
Running Audiosrv       Windows Audio
Stopped AxInstSV       ActiveX Installer (AxInstSV)
Stopped BcastDVRUserSer... GameDVR and Broadcast User Service_...
Stopped BDESVC         BitLocker Drive Encryption Service
Running BFE            Base Filtering Engine
Running BITS           Background Intelligent Transfer Ser...
Stopped BluetoothUserSe... Bluetooth User Support Service_8af8a
Running BrokerInfrastru... Background Tasks Infrastructure Ser...
Running Browser        Computer Browser
Stopped BTAGService    Bluetooth Audio Gateway Service
Stopped BthAvctpSvc     AVCTP service
Stopped bthserv        Bluetooth Support Service
Stopped camsvc         Capability Access Manager Service
Stopped CaptureService_... CaptureService_8af8a
Running CDPSvc         Connected Devices Platform Service
Running CDPUserSvc_8af8a Connected Devices Platform User Ser...
Running CertPropSvc     Certificate Propagation
Stopped ClipSvc         Client License Service (ClipSvc)
```

4. Feladat:

C:\ meghajtón lévő könyvtárak és fájlok

```
PS C:\Users\Thuun> Get-ChildItem

Directory: C:\Users\Thuun

Mode                LastWriteTime         Length Name
----                -
d-----          2022. 02. 05.      17:16             .Origin
d-----          2022. 02. 05.      17:16             .QtWebEngineProcess
d-----          2022. 02. 27.      21:04             .VirtualBox
d-r---          2022. 02. 05.      16:21          3D Objects
d-r---          2022. 02. 05.      16:21          Contacts
d-r---          2022. 02. 28.      19:42          Desktop
d-r---          2022. 02. 22.      20:35          Documents
d-r---          2022. 02. 28.      19:46          Downloads
d-r---          2022. 02. 05.      16:21          Favorites
d-----          2022. 02. 27.      20:58      IN3BLKOsGyak
d-r---          2022. 02. 05.      16:21          Links
d-r---          2022. 02. 05.      16:21          Music
dar--l          2022. 02. 05.      18:58          OneDrive
d-r---          2022. 02. 05.      17:02          Pictures
d-r---          2022. 02. 05.      16:21      Saved Games
d-r---          2022. 02. 05.      16:22          Searches
d-r---          2022. 02. 05.      17:50          Videos
d-----          2022. 02. 11.      17:58      VirtualBox VMs
-a----          2022. 02. 27.      21:04          3215 .bash_history
-a----          2022. 02. 11.      17:34           57 .gitconfig
-a----          2022. 02. 11.      17:34           20 .lessht
-a----          2022. 02. 22.      21:40          3158 .viminfo
```

5. Feladat:

Parancsok rövidített nevei

```
PS C:\Users\TEMP.IIT.003> Get-Alias

CommandType      Name                                Version      Source
-----
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-PSession
Alias            compare -> Compare-Object
Alias            copy -> Copy-Item
Alias            cp -> Copy-Item
```

6. Feladat:

„processz” nevű Alias létrehozása, futtatása és lekérdezése

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

Handles	NPM(K)	PM(K)	WS(K)	CPU(s)	Id	SI	ProcessName
-----	-----	-----	-----	-----	--	--	-----
193	10	1900	9564		10048	0	Aac3572MbHal_x86
148	8	1248	7400		9984	0	AacKingstonDramHal_x86
511	28	33948	40064	1,31	7196	1	ApplicationFrameHost
211	11	2620	9240		2224	0	AsusCertService
157	10	1916	9484		3824	0	AsusUpdateCheck
180	12	6236	9540		3892	0	atkexComSvc
193	12	7656	13264	0,14	10812	0	audiodg
272	13	4192	16296	0,34	10428	1	conhost
523	17	4652	21932	2,92	4616	1	ctfmon
581	21	1860	5376		708	0	csrss
534	29	2944	5452		848	1	csrss
215	14	12444	25064	0,11	1272	1	Discord
308	24	18220	41620	1,22	4040	1	Discord
308	19	13356	59156	0,20	4084	1	Discord
606	36	92088	118516	15,13	4800	1	Discord
1469	125	178456	235924	55,77	5972	1	Discord
909	53	40244	81640	3,97	8968	1	Discord
223	17	3784	13056	0,11	7336	1	dllhost
1294	151	91208	72740		1224	1	dwm
3097	125	126676	174896	21,70	5888	1	explorer
158	9	1420	8324		8768	0	extensionCardHal_x86
37	6	1756	4232		624	0	fontdrvhost
37	8	3268	9136		1136	1	fontdrvhost
529	28	36356	52956	0,30	9456	1	GameBar
292	12	2992	14676	0,09	1328	1	GameBarFTServer

```
PS C:\Users\Thuun> Get-Alias processz
```

CommandType	Name	Version	Source
-----	----	-----	-----
Alias	processz -> Get-Process		

7. Feladat:

Szolgáltatások (formázott lista)

```
PS C:\Users\TEMP.IIT.003> Get-Service | fl

Name           : AdobeARMservice
DisplayName     : Adobe Acrobat Update Service
Status         : Running
DependentServices : {}
ServicesDependedOn : {}
CanPauseAndContinue : False
CanShutdown    : False
CanStop        : True
ServiceType    : Win32OwnProcess

Name           : AJRouter
DisplayName     : AllJoyn Router Service
Status         : Stopped
DependentServices : {}
ServicesDependedOn : {}
CanPauseAndContinue : False
CanShutdown    : False
CanStop        : False
ServiceType    : Win32ShareProcess

Name           : ALG
DisplayName     : Application Layer Gateway Service
Status         : Stopped
DependentServices : {}
ServicesDependedOn : {}
CanPauseAndContinue : False
CanShutdown    : False
CanStop        : False
ServiceType    : Win32OwnProcess

Name           : AppIDSvc
DisplayName     : Application Identity
Status         : Stopped
DependentServices : {applockerfltr}
ServicesDependedOn : {CryptSvc, AppID, RpcSs}
CanPauseAndContinue : False
CanShutdown    : False
```

(Formázott tábla)

```
PS C:\Users\TEMP.IIT.003> Get-Service | ft
```

Status	Name	DisplayName
-----	----	-----
Running	AdobeARMservice	Adobe Acrobat Update Service
Stopped	AJRouter	AllJoyn Router Service
Stopped	ALG	Application Layer Gateway Service
Stopped	AppIDSvc	Application Identity
Running	Appinfo	Application Information
Stopped	AppMgmt	Application Management
Stopped	AppReadiness	App Readiness
Stopped	AppVClient	Microsoft App-V Client
Stopped	AppXSvc	AppX Deployment Service (AppXSVC)
Stopped	aspnet_state	ASP.NET State Service
Stopped	AssignedAccessM...	AssignedAccessManager Service
Running	AudioEndpointBu...	Windows Audio Endpoint Builder
Running	Audiosrv	Windows Audio
Stopped	AxInstSV	ActiveX Installer (AxInstSV)
Stopped	BcastDVRUserSer...	GameDVR and Broadcast User Service_...
Stopped	BDESVC	BitLocker Drive Encryption Service
Running	BFE	Base Filtering Engine
Running	BITS	Background Intelligent Transfer Ser...
Stopped	BluetoothUserSe...	Bluetooth User Support Service_8af8a
Running	BrokerInfrastru...	Background Tasks Infrastructure Ser...
Running	Browser	Computer Browser
Stopped	BTAGService	Bluetooth Audio Gateway Service
Stopped	BthAvctpSvc	AVCTP service
Stopped	bthserv	Bluetooth Support Service
Stopped	camsvc	Capability Access Manager Service
Stopped	CaptureService_...	CaptureService_8af8a
Running	CDPSvc	Connected Devices Platform Service
Running	CDPUserSvc_8af8a	Connected Devices Platform User Ser...
Running	CertPropSvc	Certificate Propagation
Stopped	ClipSVC	Client License Service (ClipSVC)

8. Feladat:

Objektumok sorba rendezése (név szerint növekvő)

```
PS C:\Users\TEMP.IIT.003> Get-Service | Sort-Object
```

Status	Name	DisplayName
-----	----	-----
Running	AdobeARMservice	Adobe Acrobat Update Service
Stopped	AJRouter	AllJoyn Router Service
Stopped	ALG	Application Layer Gateway Service
Stopped	AppIDSvc	Application Identity
Running	Appinfo	Application Information
Stopped	AppMgmt	Application Management
Stopped	AppReadiness	App Readiness
Stopped	AppVClient	Microsoft App-V Client
Stopped	AppXSvc	AppX Deployment Service (AppXSVC)
Stopped	aspnet_state	ASP.NET State Service
Stopped	AssignedAccessM...	AssignedAccessManager Service
Running	AudioEndpointBu...	Windows Audio Endpoint Builder
Running	Audiosrv	Windows Audio
Stopped	AxInstSV	ActiveX Installer (AxInstSV)
Stopped	BcastDVRUserSer...	GameDVR and Broadcast User Service

(Név szerint csökkenő)

```
PS C:\Users\TEMP.IIT.003> Get-Service | Sort-Object -Descending

Status  Name                DisplayName
-----
Stopped XboxNetApiSvc       Xbox Live Networking Service
Stopped XboxGipSvc      Xbox Accessory Management Service
Stopped XblGameSave     Xbox Live Game Save
Stopped XblAuthManager  Xbox Live Auth Manager
Stopped xbgm           Xbox Game Monitoring
Stopped WwanSvc        WWAN AutoConfig
Running wuauerv        Windows Update
Running WSearch        Windows Search
Running wscsv         Security Center
Running WpnUserService... Windows Push Notifications User Ser...
Running WpnService     Windows Push Notifications System S...
```

9. Feladat:

Neveket melyeknek első két betűje „wi”

```
PS C:\Users\TEMP.IIT.003> Get-Service | Where-Object { $_.name -like "wi*" }

Status  Name                DisplayName
-----
Stopped WiaRpc         Still Image Acquisition Events
Running WinDefend     Windows Defender Antivirus Service
Running WinHttpAutoProx... WinHTTP Web Proxy Auto-Discovery Se...
Running Winmgmt       Windows Management Instrumentation
Stopped WinRM         Windows Remote Management (WS-Manag...
Stopped wisvc         Windows Insider Service
```

10. Feladat:

Objektumok csoportosítása állapotuk szerint

```
PS C:\Users\TEMP.IIT.003> Get-Service | Group-Object status

Count Name                Group
-----
98 Running              {AdobeARMservice, Appinfo, AudioEndpointBuilder, Audiosrv...}
168 Stopped             {AJRouter, ALG, AppIDSvc, AppMgmt...}
1 StartPending          {SQLPBENGINE}
```

11. Feladat:

Objektumok száma

```
PS C:\Users\TEMP.IIT.003> (Get-Service).count
267
```

12. Feladat:

Objektumok száma: max, min, avg, sum szerint

```
PS C:\Users\TEMP.IIT.003> Get-Process | Measure-Object -Property id -Maximum -Minimum -Average -Sum

Count      : 147
Average    : 4188,13605442177
Sum        : 615656
Maximum    : 11240
Minimum    : 0
Property   : Id
```

13. Feladat

Windows idő

```
PS C:\Users\TEMP.IIT.003> Get-Service | Where-Object { $_.name -eq "w32time" }

Status      Name      DisplayName
-----
Running     W32Time    Windows Time
```

14. Feladat

Szöveg létrehozása

```
PS C:\Users\Thuun> $szoveg = "Miskolc"
```

15. Feladat

Műveletek a „szoveg” változóval

```
PS C:\Users\Thuun> $szoveg.Length
PS C:\Users\Thuun> $szoveg.ToUpper()
MISKOLC
PS C:\Users\Thuun> $szoveg.Replace("kolc", "ka")
Miska
PS C:\Users\Thuun> $szoveg -contains "asztal"
False
PS C:\Users\Thuun> $szoveg.Split("k")
Mis
olc
```

16. Feladat

txt fájlkezelés (definiálás, beolvasás, tartalom, sorok száma, fájl adatok)

```
PS C:\Users\Thuun> $f = "C:\Users\Thuun\IN3BLK.txt"
PS C:\Users\Thuun> $tartalom = Get-Content $f
PS C:\Users\Thuun> $tartalom
Zavarko Mate
PS C:\Users\Thuun> $tartalom.Count
1
PS C:\Users\Thuun> Get-Item $f

Directory: C:\Users\Thuun

Mode                LastWriteTime         Length Name
----                -
-a-----         2022. 02. 28.      20:38           12 IN3BLK.txt
```