

Practicumhandleiding
Besturingssystemen
Onderdeel Linux
TINBES03

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Opdracht 4.1

Less print de inhoud van een file of een command output. Less laat zien wat er in een bepaald bestandje staat zoals een text bestand.

Opdracht 4.2

Dit doe je met de functie Tail -f NaamBestand

Opdracht 4.3

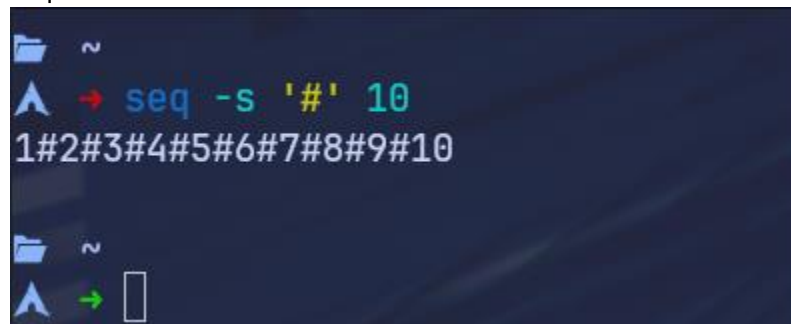
Hiervoor gebruik je de command apropos. Daar vind je bijvoorbeeld seq. Dit wordt gebruikt voor print een sequence van nummers.

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Downloads$ apropos numbers
factor (1)          - factor numbers
numfmt (1)          - Convert numbers from/to human-readable strings
openssl-core_dispatch.h (7ssl) - OpenSSL provider dispatch numbers and function types
openssl-prime (1ssl) - compute prime numbers
seq (1)             - print a sequence of numbers
xfs_ncheck (8)      - generate pathnames from i-numbers for XFS
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Downloads$
```

Je zou ook man kunnen gebruiken

Opdracht 4.4.

seq -s "#" 10



```
~  
└─┬─┘ → seq -s '#' 10  
1#2#3#4#5#6#7#8#9#10  
~  
└─┬─┘ →
```

Opdracht 5.1

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Documents$ nano gisteren
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Documents$ ls
gisteren
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Documents$
```

Opdracht 5.2

```
heb

marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Documents$ cat gisteren gisteren
ik weet niet wat
ik gisteren
gedaan
heb

ik weet niet wat
ik gisteren
gedaan
heb
```

Opdracht 5.3

```
heb

marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/Documents$ cat gisteren gisteren
ik weet niet wat
ik gisteren
gedaan
heb

ik weet niet wat
ik gisteren
gedaan
heb
```

Opdracht 5.4

Je kan man less gebruiken en dan zie je alle commando's

- Een pagina omlaag te gaan. spatie
- Een pagina omhoog te gaan. b
- Naar het eind van het bestand te springen. G
- Naar het begin van het bestand te springen. g
- Naar een woord te zoeken. /
- Naar de volgende instantie van hetzelfde woord te gaan is n
- Het programma te verlaten. Q

Opdracht 5.5

ping -i.2 localhost | less

```
PING localhost (::1) 56 data bytes
64 bytes from localhost (::1): icmp_seq=1 ttl=64 time=0.013 ms
64 bytes from localhost (::1): icmp_seq=2 ttl=64 time=0.010 ms
64 bytes from localhost (::1): icmp_seq=3 ttl=64 time=0.010 ms
64 bytes from localhost (::1): icmp_seq=4 ttl=64 time=0.009 ms
64 bytes from localhost (::1): icmp_seq=5 ttl=64 time=0.007 ms
64 bytes from localhost (::1): icmp_seq=6 ttl=64 time=0.008 ms
64 bytes from localhost (::1): icmp_seq=7 ttl=64 time=0.006 ms
64 bytes from localhost (::1): icmp_seq=8 ttl=64 time=0.008 ms
64 bytes from localhost (::1): icmp_seq=9 ttl=64 time=0.022 ms
64 bytes from localhost (::1): icmp_seq=10 ttl=64 time=0.015 ms
64 bytes from localhost (::1): icmp_seq=11 ttl=64 time=0.007 ms
64 bytes from localhost (::1): icmp_seq=12 ttl=64 time=0.009 ms
64 bytes from localhost (::1): icmp_seq=13 ttl=64 time=0.008 ms
64 bytes from localhost (::1): icmp_seq=14 ttl=64 time=0.007 ms
64 bytes from localhost (::1): icmp_seq=15 ttl=64 time=0.008 ms
64 bytes from localhost (::1): icmp_seq=16 ttl=64 time=0.009 ms
64 bytes from localhost (::1): icmp_seq=17 ttl=64 time=0.013 ms
64 bytes from localhost (::1): icmp_seq=18 ttl=64 time=0.009 ms
64 bytes from localhost (::1): icmp_seq=19 ttl=64 time=0.007 ms
64 bytes from localhost (::1): icmp_seq=20 ttl=64 time=0.009 ms
64 bytes from localhost (::1): icmp_seq=21 ttl=64 time=0.013 ms
64 bytes from localhost (::1): icmp_seq=22 ttl=64 time=0.009 ms
64 bytes from localhost (::1): icmp_seq=23 ttl=64 time=0.010 ms
64 bytes from localhost (::1): icmp_seq=24 ttl=64 time=0.010 ms
64 bytes from localhost (::1): icmp_seq=25 ttl=64 time=0.018 ms
64 bytes from localhost (::1): icmp_seq=26 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=27 ttl=64 time=0.017 ms
64 bytes from localhost (::1): icmp_seq=28 ttl=64 time=0.014 ms
64 bytes from localhost (::1): icmp_seq=29 ttl=64 time=0.013 ms
64 bytes from localhost (::1): icmp_seq=30 ttl=64 time=0.017 ms
64 bytes from localhost (::1): icmp_seq=31 ttl=64 time=0.017 ms
64 bytes from localhost (::1): icmp_seq=32 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=33 ttl=64 time=0.015 ms
64 bytes from localhost (::1): icmp_seq=34 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=35 ttl=64 time=0.018 ms
64 bytes from localhost (::1): icmp_seq=36 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=37 ttl=64 time=0.016 ms
```

Opdracht 5.6

less < /dev/random

Opdracht 5.7

Cut = cut - remove sections from each line of files

Print selected parts of lines from each FILE to standard output.

With no FILE, or when FILE is -, read standard input.

sort = sort - sort lines of text files

Write sorted concatenation of all FILE(s) to standard output.

With no FILE, or when FILE is -, read standard input.

Head =

head - output the first part of files

Print the first 10 lines of each FILE to standard output. With more than one FILE, precede each with a header giving the file name.

With no FILE, or when FILE is -, read standard input.

Tail =

tail - output the last part of files

Print the last 10 lines of each FILE to standard output. With more than one FILE, precede each with a header giving the file name.

With no FILE, or when FILE is -, read standard input.

Wc =

wc - print newline, word, and byte counts for each file

Print newline, word, and byte counts for each FILE, and a total line if more than one FILE is specified. A word is a non-zero-length sequence of characters delimited by white space.

With no FILE, or when FILE is -, read standard input.

Opdracht 5.8

Sort -r gisteren

Opdracht 5.9

cut -c1 gisteren

Opdracht 5.10

Wc -l gisteren

Opdracht 5.11

Head -n5 gisteren

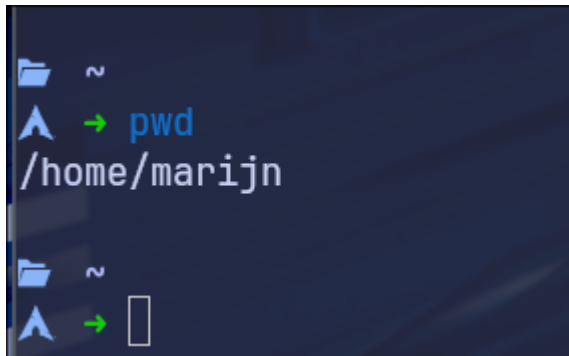
Opdracht 5.12

Tail -n3 gisteren

Opdracht 5.13

head -n 5 gisteren3 | tail -n 3 | wc -m | less

Opdracht 6.1
command pwd



Opdracht 6.2

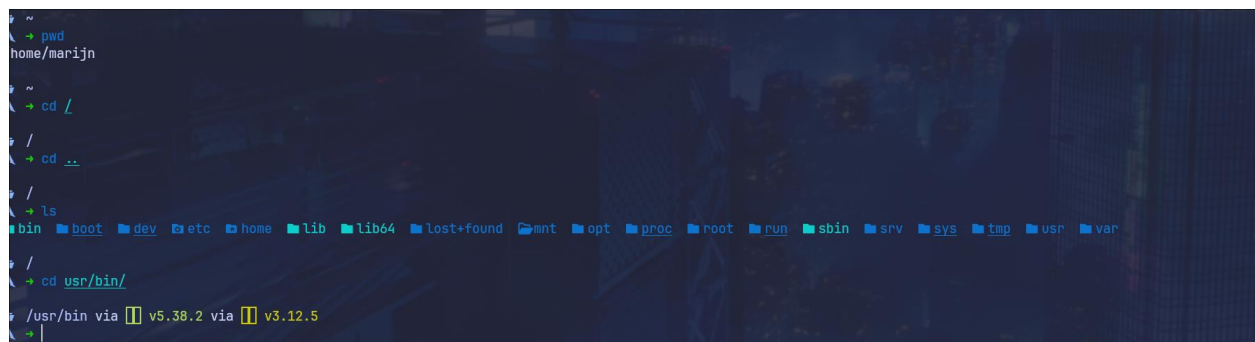
Cd .. om een pad terug te gaan

Opdracht 6.3

Cd usr/bin/

Of:

Cd / om naar root te gaan



[illegible]

Waar verwijst ~/./../. naar?

Opdracht 6.6

```
+ x usr
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ cd ../../usr
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:usr$ ls
bin games include lib lib32 lib64 libexec libx32 local sbin share src
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:usr$
```


Opdracht 6.7

```
bin  games  include  lib  lib32  lib64  libexec  libx32  local  sbin  share  src
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:/usr$ ls -l
total 156
drwxr-xr-x  2 root root 69632 May 12 14:17 bin
drwxr-xr-x  2 root root 4096 Apr 19 13:32 games
drwxr-xr-x 67 root root 12288 Apr 20 12:57 include
drwxr-xr-x 113 root root 4096 Apr 20 12:57 lib
drwxr-xr-x  2 root root 4096 Jan 29 17:05 lib32
drwxr-xr-x  2 root root 4096 Jan 29 17:05 lib64
drwxr-xr-x 15 root root 12288 Apr 13 11:19 libexec
drwxr-xr-x  2 root root 4096 Jan 29 17:05 libx32
drwxr-xr-x 10 root root 4096 Jan 29 17:05 local
drwxr-xr-x  2 root root 20480 May 12 14:17 sbin
drwxr-xr-x 269 root root 12288 May 12 14:16 share
drwxr-xr-x  5 root root 4096 May 12 14:58 src
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:/usr$
```

Er zijn 156 bestanden en 12 sub directories

Opdracht 6.8

De personen van wie het is en kan openen?

Opdracht 7.1 tot en met 9

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ mkdir eerste
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ cd eerste/
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mkdir tweede
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ ls
tweede
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ cd ..
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ sudo nano mijnBestand
[sudo] password for marijn:
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ mv mijnBestand ~/eerste/tweede/
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ cd eerste/tweede/
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ ls
mijnBestand
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ less mijnBestand
s^Cijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ ^C
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ ^C
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ man cp
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ cp mijnBestand ../..
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ ls
mijnBestand
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ cd ..
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ cd ..
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
Arduino  build  Desktop  Documents  Downloads  eerste  elementaryRecolor  gnome-ext-hanabi
mijnBestand  Music  Pictures  Public  snap  Templates  Videos
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ rm mijnBestand
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```


Arduino build Desktop Documents Downloads eerste elementaryRecolor gnome-ext-hanabi Music Pictures Public snap Templates Videos

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ cd eerste/tweede/
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ ls
```

```
mijnBestand
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ cp mijnBestand ../..
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste/tweede$ cd ..
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ cd ..
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```

Arduino build Desktop Documents Downloads eerste elementaryRecolor gnome-ext-hanabi

mijnBestand Music Pictures Public snap Templates Videos

```
^Crijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ^C
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ^C
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```

Arduino build Desktop Documents Downloads eerste elementaryRecolor gnome-ext-hanabi

mijnBestand Music Pictures Public snap Templates Videos

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ mv mijnBestand eenAnderBestand
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```

Arduino build Desktop Documents Downloads eenAnderBestand eerste elementaryRecolor gnome-ext-hanabi Music Pictures Public snap Templates Videos

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ mv eenAnderBestand /
```

```
mv: cannot move 'eenAnderBestand' to '/eenAnderBestand': Permission denied
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ rm eenAnderBestand
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```

Arduino build Desktop Documents Downloads eerste elementaryRecolor gnome-ext-hanabi Music Pictures Public snap Templates Videos

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ rmdir eerste/
```

```
rmdir: failed to remove 'eerste/': Directory not empty
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ cd eerste/
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mv tweede/ cd ..
```

```
mv: cannot stat 'cd': No such file or directory
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mv tweede/ ..
```

```
mv: cannot stat 'tweede/': No such file or directory
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mv tweede/ ../
```

```
mv: cannot stat 'tweede/': No such file or directory
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mvdir tweede/ ../
```

```
Command 'mvdir' not found, did you mean:
```

```
command 'svdir' from deb svtools (0.6-5)
```

```
command 'vdir' from deb coreutils (8.32-4.1ubuntu1)
```

```
command 'mkdir' from deb coreutils (8.32-4.1ubuntu1)
```

```
command 'mvdic' from deb canna-utils (3.7p3-17)
```

```
command 'mdir' from deb mtools (4.0.33-1+really4.0.32-1build1)
```

```
command 'mmdir' from deb simh (3.8.1-6.1)
```

Try: sudo apt install <deb name>

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mv ../tweede/ ../
```

```
mv: '../tweede/' and '../tweede' are the same file
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mv ../tweede/ ../../
```

```
mv: cannot move '../tweede/' to '../../tweede': Permission denied
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ mv ../tweede/ ~/
```

```
mv: '../tweede/' and '/home/marijn/tweede' are the same file
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ ls
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/eerste$ cd ..
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```

```
Arduino build Desktop Documents Downloads eerste elementaryRecolor gnome-ext-hanabi Music  
Pictures Public snap Templates tweede Videos
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ rmdir tweede/
```

```
rmdir: failed to remove 'tweede/': Directory not empty
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ cd tweede/
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/tweede$ ls
```

```
mijnBestand
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/tweede$ rmdir ~/eerste/
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/tweede$ ls
```

```
mijnBestand
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~/tweede$ cd ..
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$ ls
```

```
Arduino build Desktop Documents Downloads elementaryRecolor gnome-ext-hanabi Music Pictures  
Public snap Templates tweede Videos
```

```
marijn@Lenovo-IdeaPad-S540-15IWL-GTX-deef6fee:~$
```

Opdracht 8.1

ls s*

```

/usr/bin via v5.38.2 via v3.12.5
^ → ls s*
] sasldblistusers2      ] setxkbmap              ] solid-hardware6       ] sudo_logsrvd
] saslpasswd2           ] sexp-conv              ] solid-power           ] sudo_sendlog
] sbcdec                ] sfdisk                 ] sord_validate         ] sudoedit
] sbcenc                ] sftp                   ] sordi                 ] sudoreplay
] sbcinfo               ] sfv-hash               ] sort                  ] sulogin
] scalar                ] sg                      ] sotruss               ] sum
] scdoc                 ] sh                     ] spa-acp-tool          ] svlc
] sclient               ] sha1sum                ] spa-inspect           ] swapon
] scmp_sys_resolver     ] sha224sum              ] spa-json-dump         ] swaybg
] scp                   ] sha256sum              ] spa-monitor           ] switch_root
] screendump            ] sha384sum              ] spa-resample          ] sxpm
] script                ] sha512sum              ] spawn_console         ] symkeyutil
] scriptlive            ] shlibsigh              ] spawn_login           ] sync
] scriptreplay          ] showconsolefont        ] speexdec              ] syncqt.pl
] sd2raw                ] showdb                  ] speexenc              ] syncqt.pl-qt5
] sd2svg                ] showjournal            ] spellout              ] sysctl
] sd2text               ] showkey                 ] spirv-as              ] systemctl
] sdbus-c++-xml2cpp     ] showstat4              ] spirv-cfg             ] systemd-ac-power
] sdc2csv               ] showwall                ] spirv-dis             ] systemd-analyze
] sddm                  ] shred                   ] spirv-lesspipe.sh    ] systemd-ask-password
] sddm-greeter           ] shuf                     ] spirv-link            ] systemd-cat
] sddm-greeter-qt6      ] shutdown                ] spirv-lint            ] systemd-cgls
] sdiff                 ] signtool                ] spirv-objdump         ] systemd-cgtop
] sdl2-config           ] signver                 ] spirv-opt             ] systemd-confext
] sdw2html              ] sim_client              ] spirv-reduce          ] systemd-creds
] seatd                 ] sim_server              ] spirv-remap           ] systemd-cryptenroll
] seatd-launch          ] size                     ] spirv-val             ] systemd-cryptsetup
] secret-tool           ] skdump                  ] split                 ] systemd-delta
] sed                   ] sktest                  ] srt-ffmpeg            ] systemd-detect-virt
] sendiso               ] slabtop                 ] srt-file-transmit     ] systemd-dissect
] sensor                ] sleep                   ] srt-live-transmit     ] systemd-escape
] sensors               ] sln                      ] srt-tunnel            ] systemd-firstboot
] sensors-conf-convert  ] slurp                    ] ss                     ] systemd-home-fallback-shell
] sensors-detect        ] smb2-quota               ] sserver               ] systemd-hwdb
] sepdebugcrcfix        ] smbcacls                 ] ssh                    ] systemd-id128
] seq                   ] smbclient                ] ssh-add               ] systemd-inhibit
] serdi                 ] smbcquotas              ] ssh-agent             ] systemd-machine-id-setup
] servicemenuinstaller  ] smbget                   ] ssh-copy-id           ] systemd-mount
] setarch               ] smbinfo                  ] ssh-keygen            ] systemd-notify
] setcap                ] smbpool                  ] ssh-keyscan           ] systemd-nspawn
] setcifsacl            ] smbtree                  ] ssh-keygen            ] systemd-path
] setfacl               ] sndfile-cmp              ] ssh-keyscan           ] systemd-repart
] setfattr              ] sndfile-concat           ] sshd                   ] systemd-resolve
] setfont               ] sndfile-convert
] setkeycodes

```

Opdracht 8.2

Ls *a*b*

/usr/bin via v5.38.2 via v3.12.5

→ ls *a*b*

abw2html	imlib2_grab	msgattrib	xfce4-about
abw2raw	ip6tables	mtp-albumart	xtables-legacy-multi
abw2text	ip6tables-apply	mtp-albums	xtables-monitor
amrnb-dec	ip6tables-legacy	nvidia-bug-report.sh	xtables-nft-multi
amrnb-enc	ip6tables-legacy-restore	nvidia-debugdump	yad-icon-browser
amrwb-dec	ip6tables-legacy-save	nvidia-modprobe	
arptables-nft	ip6tables-nft	pacman-db-upgrade	
arptables-nft-restore	ip6tables-nft-restore	partprobe	
arptables-nft-save	ip6tables-nft-save	pipewire-avb	
avahi-bookmarks	ip6tables-restore	pk-example-frobnicate	
avahi-browse	ip6tables-restore-translate	portablectl	
avahi-browse-domains	ip6tables-save	psfaddtable	
avahi-publish	ip6tables-translate	psfgettable	
avahi-publish-address	iptables	psfstriptable	
avahi-publish-service	iptables-apply	psfxtable	
badblocks	iptables-legacy	ranlib	
bashbug	iptables-legacy-restore	redland-db-upgrade	
canberra-boot	iptables-legacy-save	sasldblistusers2	
canberra-gtk-play	iptables-nft	setvesablanck	
disable-paste	iptables-nft-restore	slabtop	
display-buttons	iptables-nft-save	swaplabel	
e2label	iptables-restore	swaybg	
ebtables-nft	iptables-restore-translate	systemd-home-fallback-shell	
ebtables-nft-restore	iptables-save	tabs	
ebtables-nft-save	iptables-translate	taglib-config	
ebtables-translate	iptables-xml	ts_calibrate	
gawkbug	ir-keytable	update-desktop-database	
gcc-ranlib	lastb	update-mime-database	
grub-macbless	libwacom-update-db	waybar	
grub-mkpasswd-pbkdf2	makedb	x86_64-linux-gnu-gcc-ranlib	
grub-render-label	mbdctl_gen_random_ctr_drbg	x86_64-pc-linux-gnu-gcc-ranlib	

/usr/bin via v5.38.2 via v3.12.5

Opdracht 8.3

Ls ?????

```
/usr/bin via v5.38.2 via v3.12.5
→ ls ?????
a52dec  bzmorc  fc-cat  grodvi  keyctl  lzmore  out123  pydoc3  sd2svg  tunelp  xrandr
agetty  ccmake  ffmpeg  grolob  kitten  makedb  pacman  python  setcap  umount  xtrace
aomdec  cfdisk  ffplay  grolj4  kpropd  md5sum  paplay  qmake6  setpci  unlink  xxhsum
aomenc  chattr  fh2raw  gropdf  ktutil  mke2fs  parted  qmls6  setsid  unlzma  xzdiff
argon2  chroot  fh2svg  grotty  ld.bfd  mkfifo  passwd  qmlmin  sfdisk  unopkg  xzgrep
arping  codium  findfs  groups  ldbadd  mkswap  pcilmr  qvkgen  showdb  unzstd  xzless
auditd  colcrt  flex++  gunzip  ldbdel  mktemp  pdfmom  ranlib  skdump  upower  xzmore
aulast  column  fstrim  hlttest  libtar  mmroff  pdfsig  rapper  sktest  uptime  zegrep
backup  csplit  funzip  hostid  lnstat  mp3rtp  peekfd  reboot  smbget  vercmp  zenity
base32  ctstat  gcc-ar  hunzip  lbase  mpg123  pfetch  rename  smbtar  visudo  zfgrep
base64  dcadec  gcc-nm  hyprpm  localc  msgcat  pipesz  renice  sndiod  vmstat  zforce
basenc  depmod  genbrk  icupkg  locale  msgcmp  pkexec  rfkil  soelim  vpxdec  zipcmp
bridge  dtsdec  gencat  ifstat  lodraw  msgfmt  pngfix  route  ssltap  vpxenc  zstdmt
brotli  dvcont  gencfu  insmod  logger  mtrace  printf  rtacct  stdbuf  vspipe
bscatl  e2fsck  gencmn  ionice  lomath  netcap  pstree  rtstat  swapon  waybar
bsdcat  e2undo  getcat  iproxy  lsattr  newgrp  pw-cat  runcon  swaybg  whoami
bsdtr  efivar  getent  ir-ctl  lua5.4  nf-log  pw-cli  sbcdec  sysctl  wipefs
bshell  enosys  getopt  irqtop  lz4cat  numfmt  pw-dot  sbcenc  thunar  wpexec
busctl  expand  giffix  isaset  lzdiff  ollama  pw-mon  scalar  thunar  x86_64
bzdiff  expiry  gpgscm  jpgicc  lzgrep  oomctl  pw-top  script  tiffcp  xinput
bzgrep  factor  gpgtar  kadmin  lzless  openvt  pwconv  sd2raw  tiffcp  xkbcli

/usr/bin via v5.38.2 via v3.12.5
→ |
```

Opdracht 9.1

Chmod wordt gebruikt om bestanden uitvoerbaar te maken.

De u staat voor use, de g staat voor group en de plus x staat voor uitvoeren.

Opdracht 9.2

Chmod a+w mijnBestand

Opdracht 9.3

Chmod a+r mijnBestand

Opdracht 10.1

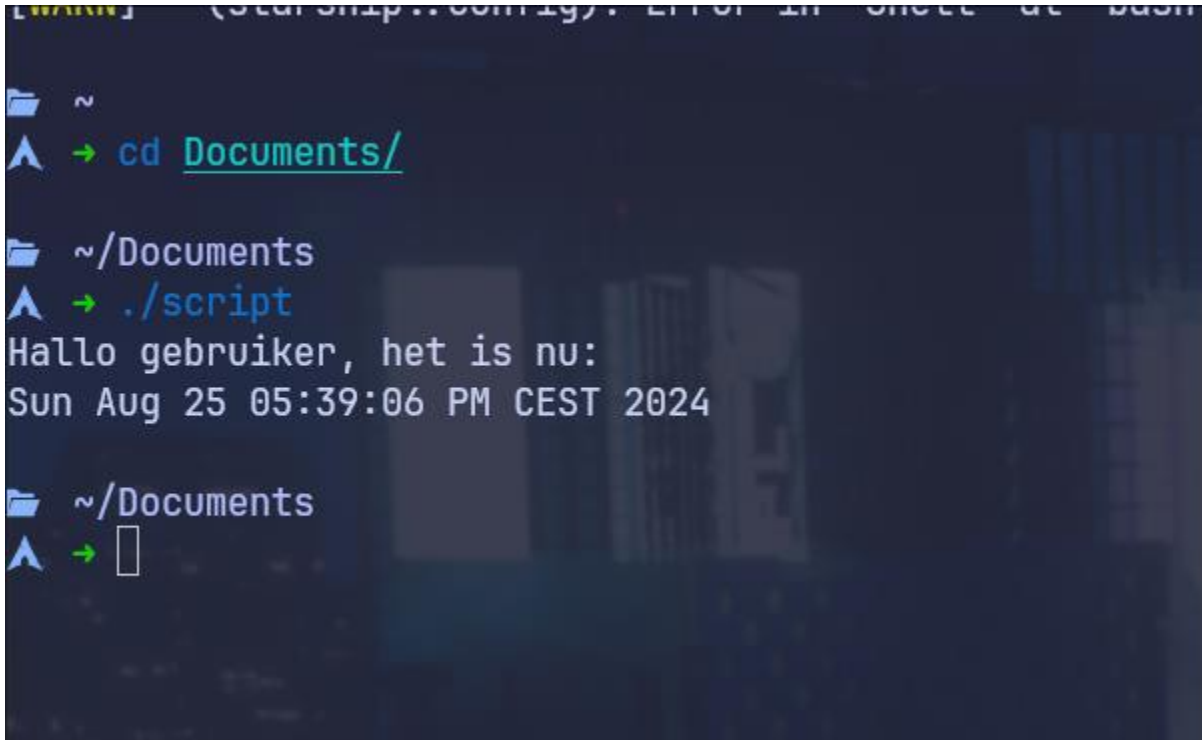
Met commando df kan je het zien

```
/usr/bin via v5.38.2 via v3.12.5
^ → df
Filesystem      1K-blocks      Used Available Use% Mounted on
dev              32868044         0   32868044  0% /dev
run              32875712      1932   32873780  1% /run
efivarfs         128           47        77   39% /sys/firmware/efi/efivars
/dev/nvme1n1p2  478563072  36024036  418155856  8% /
tmpfs            32875712      58388   32817324  1% /dev/shm
tmpfs            1024           0        1024  0% /run/credentials/systemd-journald.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-network-generator.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-udev-load-credentials.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-tmpfiles-setup-dev-early.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-tmpfiles-setup-dev.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-vconsole-setup.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-sysctl.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-networkd.service
tmpfs            32875716      28680   32847036  1% /tmp
/dev/nvme1n1p1  1046512      98384   948128    10% /boot
tmpfs            1024           0        1024  0% /run/credentials/systemd-tmpfiles-setup.service
tmpfs            1024           0        1024  0% /run/credentials/systemd-resolved.service
tmpfs            6575140      22552   6552588  1% /run/user/1000
/usr/bin via v5.38.2 via v3.12.5
```

Opdracht 10.2

```
/usr/bin via v5.38.2 via v3.12.5
^ → df -h ~/
Filesystem      Size  Used Avail Use% Mounted on
/dev/nvme1n1p2  457G   35G  399G   8% /
/usr/bin via v5.38.2 via v3.12.5
^ → |
```

Opdracht 11.1

A terminal window with a dark blue background. The prompt is '~'. The user enters 'cd Documents/' and the prompt changes to '~ / Documents'. The user then enters './script' and the terminal outputs 'Hallo gebruiker, het is nu:' followed by 'Sun Aug 25 05:39:06 PM CEST 2024'. The prompt returns to '~ / Documents'.

```
#!/bin/bash
echo "Hallo gebruiker, het is nu:"
date
```

Opdracht 11.2

A terminal window with a dark blue background. The prompt is '~ / Documents' with a clock icon and '12s' in the background. The user enters './script' and the terminal outputs 'Hallo marijn, hoe gaat het met je?'. The prompt returns to '~ / Documents'.

```
#!/bin/bash
naam=marijn
echo "Hallo $naam, hoe gaat het met je?"
```


Opdracht 11.3

```
Het bestand 'gisteren' bevat  woorden.

~/Documents
└─> sudo nano gisteren

~/Documents
└─> ./script
Het bestand 'gisteren' bevat 1 woorden.

~/Documents
└─> 
```

```
#!/bin/bash
aantal=$(wc -w < gisteren)
echo "Het bestand 'gisteren' bevat $aantal woorden."
```

Opdracht 11.4

```
~/Documents via C v14.2.1-gcc
└─> ./script-hernoemd
Gebruik: ./script-hernoemd <bestandsnaam>

~/Documents via C v14.2.1-gcc
└─> ls
gisteren-hernoemd  receive_message.c  send_message  typescript-hernoemd
receive_message    script-hernoemd    send_message.c

~/Documents via C v14.2.1-gcc
└─> ./script-hernoemd gisteren-hernoemd
Het bestand 'gisteren-hernoemd' bevat 1 woorden.

~/Documents via C v14.2.1-gcc
└─> 
```

```
#!/bin/bash

# Controleer of er een bestandsnaam is meegegeven
if [ -z "$1" ]; then
    echo "Gebruik: $0 <bestandsnaam>"
    exit 1
fi

# Bestandsnaam en aantal woorden bepalen
bestand="$1"
aantal_woorden=$(wc -w < "$bestand")
```

```
# Output weergeven  
echo "Het bestand '$bestand' bevat $aantal_woorden woorden."
```

Opdracht 11.5

A terminal window with a dark blue background. The prompt is ~/Documents. The first command is ./script, which outputs 'Fout: Geen bestand opgegeven.'. The second command is ./script gisteren, which outputs 'Het bestand 'gisteren' bevat 1 woorden.'. The third command is an empty input, showing a cursor.

```
~/Documents 4m1s  
→ ./script  
Fout: Geen bestand opgegeven.  
  
~/Documents  
→ ./script gisteren  
Het bestand 'gisteren' bevat 1 woorden.  
  
~/Documents  
→
```

```
#!/bin/bash  
if [[ -z $1 ]]; then  
    echo "Fout: Geen bestand opgegeven."  
    exit 1  
fi  
  
bestand=$1  
  
if [[ ! -f $bestand ]]; then  
    echo "Fout: Het bestand '$bestand' bestaat niet."  
    exit 1  
fi  
aantal=$(wc -w < "$bestand")  
  
echo "Het bestand '$bestand' bevat $aantal woorden."
```

Opdracht 11.6

```
If one of those bottles would happen to fall, there'd be 17 bottles of beer on the wall.  
17 bottles of beer on the wall, 17 bottles of beer.  
If one of those bottles would happen to fall, there'd be 16 bottles of beer on the wall.  
16 bottles of beer on the wall, 16 bottles of beer.  
If one of those bottles would happen to fall, there'd be 15 bottles of beer on the wall.  
15 bottles of beer on the wall, 15 bottles of beer.  
If one of those bottles would happen to fall, there'd be 14 bottles of beer on the wall.  
14 bottles of beer on the wall, 14 bottles of beer.  
If one of those bottles would happen to fall, there'd be 13 bottles of beer on the wall.  
13 bottles of beer on the wall, 13 bottles of beer.  
If one of those bottles would happen to fall, there'd be 12 bottles of beer on the wall.  
12 bottles of beer on the wall, 12 bottles of beer.  
If one of those bottles would happen to fall, there'd be 11 bottles of beer on the wall.  
11 bottles of beer on the wall, 11 bottles of beer.  
If one of those bottles would happen to fall, there'd be 10 bottles of beer on the wall.  
10 bottles of beer on the wall, 10 bottles of beer.  
If one of those bottles would happen to fall, there'd be 9 bottles of beer on the wall.  
9 bottles of beer on the wall, 9 bottles of beer.  
If one of those bottles would happen to fall, there'd be 8 bottles of beer on the wall.  
8 bottles of beer on the wall, 8 bottles of beer.  
If one of those bottles would happen to fall, there'd be 7 bottles of beer on the wall.  
7 bottles of beer on the wall, 7 bottles of beer.  
If one of those bottles would happen to fall, there'd be 6 bottles of beer on the wall.  
6 bottles of beer on the wall, 6 bottles of beer.  
If one of those bottles would happen to fall, there'd be 5 bottles of beer on the wall.  
5 bottles of beer on the wall, 5 bottles of beer.  
If one of those bottles would happen to fall, there'd be 4 bottles of beer on the wall.  
4 bottles of beer on the wall, 4 bottles of beer.  
If one of those bottles would happen to fall, there'd be 3 bottles of beer on the wall.  
3 bottles of beer on the wall, 3 bottles of beer.  
If one of those bottles would happen to fall, there'd be 2 bottles of beer on the wall.  
2 bottles of beer on the wall, 2 bottles of beer.  
If one of those bottles would happen to fall, there'd be 1 bottles of beer on the wall.  
1 bottle of beer on the wall, 1 bottle of beer.  
If that bottle would happen to fall, there'd be no bottles of beer on the wall.
```

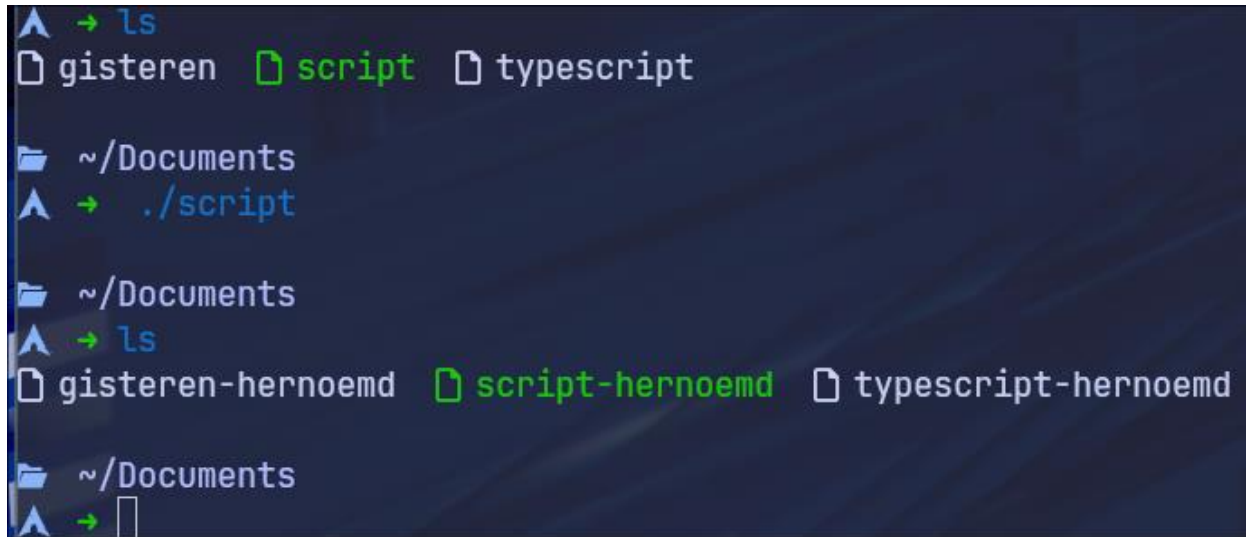
~/Documents

#!/bin/bash

```
for ((i = 100 ; i >= 1 ; i-- )); do  
    if ((i > 1 )); then  
        echo "$i bottles of beer on the wall, $i bottles of beer."  
        echo "If one of those bottles would happen to fall, there'd be $((i - 1)) bottles of beer on  
the wall."  
    else  
        echo "1 bottle of beer on the wall, 1 bottle of beer."    fi  
done
```

```
    echo "If that bottle would happen to fall, there'd be no bottles of beer on the wall."
fi
echo "" sud
done
```

Opdracht 11.7



```
#!/bin/bash
```

```
for bestand in *; do
    if [[ -f $bestand ]]; then
        nieuwe_naam="${bestand}-hernoemd"
        mv "$bestand" "$nieuwe_naam"
    fi
done
```

Opdracht 11.8

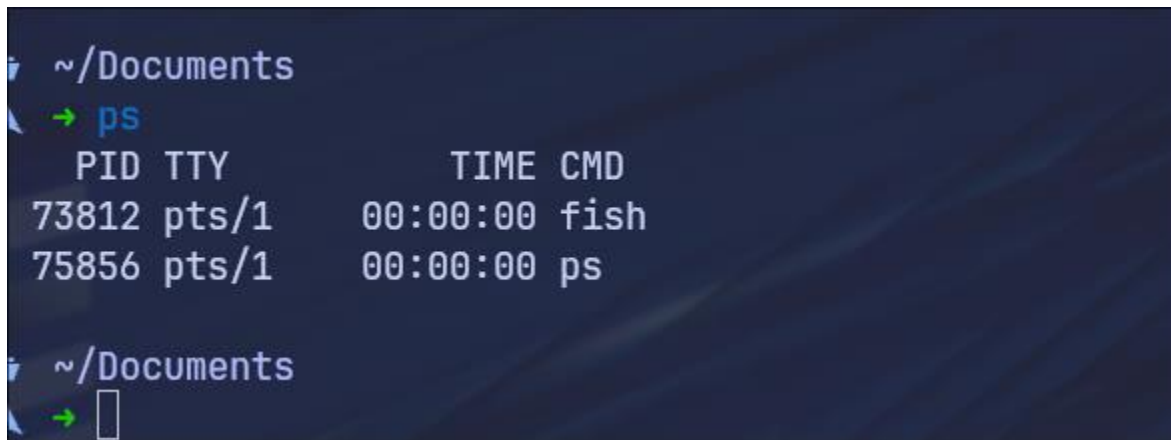
```
#!/bin/bash
export naam="marijn"
./script2.sh
echo "In script1, naam is: $naam"
```

```
#!/bin/bash
```

```
echo "In script2, naam is: $naam"
naam=" marijn213"
```

echo "In script2, naam na wijziging is: \$naam"

Opdracht 12.1

A terminal window with a dark blue background. The prompt is '~ /Documents'. The user has entered the command 'ps' in green. The output is a table with four columns: PID, TTY, TIME, and CMD. The first row shows PID 73812, TTY pts/1, TIME 00:00:00, and CMD fish. The second row shows PID 75856, TTY pts/1, TIME 00:00:00, and CMD ps. The prompt '~ /Documents' is repeated below the output, followed by a green cursor and an empty input box.

```
~ /Documents
→ ps
  PID TTY          TIME CMD
 73812 pts/1    00:00:00 fish
 75856 pts/1    00:00:00 ps

~ /Documents
→ 
```

Ps

Pid 73812 en 75856

Opdracht 12.2

Ps -u root

Of ps -u root | wc -l

```
37219 ?      00:00:00 kworker/1:0-mm_percpu_wq
39982 ?      00:00:00 kworker/8:2-mm_percpu_wq
43839 ?      00:00:00 kworker/u64:3-events_power_efficient
46192 ?      00:00:00 kworker/4:0-events
58483 ?      00:00:00 kworker/u64:1-events_unbound
63243 ?      00:00:00 kworker/3:1-events
63466 ?      00:00:00 kworker/15:2-events
65506 ?      00:00:00 kworker/u64:0-events_unbound
65594 ?      00:00:00 kworker/11:1-events
68378 ?      00:00:00 kworker/8:0-mm_percpu_wq
70178 ?      00:00:00 kworker/5:2-cgroup_destroy
70190 ?      00:00:00 kworker/12:2-mm_percpu_wq
70828 ?      00:00:00 kworker/0:1-cgroup_destroy
71057 ?      00:00:00 kworker/u64:2-events_unbound
71242 ?      00:00:00 kworker/14:0-cgroup_destroy
71246 ?      00:00:00 kworker/4:2-mm_percpu_wq
71406 ?      00:00:00 kworker/9:2-mm_percpu_wq
71440 ?      00:00:00 kworker/7:0-events
71694 ?      00:00:00 kworker/10:0-cgroup_destroy
72367 ?      00:00:00 kworker/1:2-cgroup_destroy
72404 ?      00:00:00 kworker/15:1-cgroup_destroy
72526 ?      00:00:00 kworker/0:2-cgroup_destroy
72538 ?      00:00:00 kworker/3:2-cgroup_destroy
72569 ?      00:00:00 kworker/5:0-mm_percpu_wq
72675 ?      00:00:00 kworker/13:0-cgroup_destroy
72762 ?      00:00:00 kworker/6:0-cgroup_destroy
72819 ?      00:00:00 kworker/2:2-cgroup_destroy
72856 ?      00:00:00 kworker/11:2-cgroup_destroy
73192 ?      00:00:00 kworker/14:1-cgroup_destroy
73287 ?      00:00:00 kworker/12:1-mm_percpu_wq
73727 ?      00:00:00 kworker/7:2-cgroup_destroy
74043 ?      00:00:00 kworker/9:1-cgroup_destroy
74162 ?      00:00:00 kworker/u64:4
74887 ?      00:00:00 kworker/3:0-cgroup_destroy
75037 ?      00:00:00 kworker/1:1-cgroup_destroy
75087 ?      00:00:00 kworker/13:1-mm_percpu_wq
75168 ?      00:00:00 kworker/15:0-cgroup_destroy
75186 ?      00:00:00 systemd-userwor
75222 ?      00:00:00 systemd-userwor
75246 ?      00:00:00 kworker/11:0-cgroup_destroy
75361 ?      00:00:00 kworker/4:1-events
75772 ?      00:00:00 kworker/8:1
75890 ?      00:00:00 kworker/14:2-mm_percpu_wq
76098 ?      00:00:00 kworker/2:0-cgroup_destroy
76407 ?      00:00:00 kworker/12:0-cgroup_destroy
76432 ?      00:00:00 kworker/6:2
76970 ?      00:00:00 systemd-userwor
77076 ?      00:00:00 kworker/9:0
```


~/Documents via C v14.2.1-gcc

→ ps -u root | wc -l

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~/Documents via C v14.2.1-gcc

```
~/Documents
→ ps a

PID TTY      STAT   TIME COMMAND
668 tty2      Ssl+   0:01 /usr/lib/Xorg -nolisten tcp -background none -seat seat0 vt2 -auth /run/sddm/xauth_Cyh
829 tty1      Ssl+   4:32 HyprLand
930 tty1      S+     0:00 /bin/sh -c waybar & hyprpaper
934 tty1      SL+    0:15 waybar
935 tty1      SL+    0:00 hyprpaper
1678 tty1      SL+    1:42 /usr/lib/chromium/chromium
1694 tty1      S+     0:00 /usr/lib/chromium/chromium --type=zygote --no-zygote-sandbox --crashpad-handler-pid=16
1695 tty1      S+     0:00 /usr/lib/chromium/chromium --type=zygote --crashpad-handler-pid=1688 --enable-crash-re
1697 tty1      S+     0:00 /usr/lib/chromium/chromium --type=zygote --crashpad-handler-pid=1688 --enable-crash-re
1700 tty1      S+     0:19 Xwayland :1 -rootless -core -terminate 10 -listenfd 45 -listenfd 46 -displayfd 145 -wm
1720 tty1      RL+    1:55 /usr/lib/chromium/chromium --type=gpu-process --crashpad-handler-pid=1688 --enable-cra
1725 tty1      SL+    0:21 /usr/lib/chromium/chromium --type=utility --utility-sub-type=network.mojom.NetworkServ
1734 tty1      SL+    0:01 /usr/lib/chromium/chromium --type=utility --utility-sub-type=storage.mojom.StorageServ
1772 tty1      S+     0:00 /usr/lib/chromium/chromium --type=broker
1815 tty1      SL+    0:12 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
2383 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=utility --utility-sub-type=audio.mojom.AudioService
37887 tty1      SL+    0:10 /opt/discord/Discord
37898 tty1      S+     0:00 /opt/discord/Discord --type=zygote --no-zygote-sandbox
37899 tty1      S+     0:00 /opt/discord/Discord --type=zygote
37901 tty1      S+     0:00 /opt/discord/Discord --type=zygote
37943 tty1      SL+    0:03 /opt/discord/Discord --type=utility --utility-sub-type=network.mojom.NetworkService --
37973 tty1      SL+    0:04 /opt/discord/Discord --type=gpu-process --crashpad-handler-pid=37915 --enable-crash-re
38033 tty1      SL+    1:30 /opt/discord/Discord --type=renderer --crashpad-handler-pid=37915 --enable-crash-repor
38073 tty1      SL+    0:00 /opt/discord/Discord --type=utility --utility-sub-type=audio.mojom.AudioService --lang
42247 tty1      SL+    0:01 /usr/bin/thunar
43109 tty1      SL+    0:05 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
65895 tty1      SL+    0:01 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
65919 tty1      SL+    0:12 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
67327 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
67350 tty1      SL+    1:17 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
67385 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
67394 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
67405 tty1      SL+    1:22 kitty
67443 pts/0      Ss     0:00 /usr/bin/fish
67545 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
68140 tty1      SL+    0:51 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
73811 pts/0      S+     0:00 script
73812 pts/1      Ssl    0:00 fish -i
75600 tty1      SL+    0:00 /usr/lib/libreoffice/program/oosplash --writer /home/marijn/Downloads/Week5.docx
75617 tty1      SL+    0:01 /usr/lib/libreoffice/program/soffice.bin --writer /home/marijn/Downloads/Week5.docx --
75798 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
75804 tty1      SL+    0:00 /usr/lib/chromium/chromium --type=renderer --crashpad-handler-pid=1688 --enable-crash-
76483 pts/1      R+     0:00 ps a

~/Documents
→
```

Opdracht 12.3

Ps u a

Of `ps aux | awk '{print $1}' | tail -n +2 | sort | uniq | wc -l`

Sort is om te sorteren uniq voor alle unique wcl om te tellen

```
~/Documents
A → ps u a
```

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
root	668	0.0	0.0	25384948	63480	tty2	Ssl+	16:16	0:01	/usr/lib/Xorg -nolisten tcp -background none -se
marijn	829	4.6	0.4	881112	322268	tty1	Ssl+	16:16	4:48	Hyprland
marijn	930	0.0	0.0	7520	3328	tty1	S+	16:16	0:00	/bin/sh -c waybar & hyprpaper
marijn	934	0.2	0.0	1873716	53720	tty1	Sl+	16:16	0:15	waybar
marijn	935	0.0	0.1	165500	81056	tty1	Sl+	16:16	0:00	hyprpaper
marijn	1678	1.7	0.4	34400992	327988	tty1	Sl+	16:17	1:46	/usr/lib/chromium/chromium
marijn	1694	0.0	0.0	34237672	42868	tty1	S+	16:17	0:00	/usr/lib/chromium/chromium --type=zygote --no-zy
marijn	1695	0.0	0.0	34237660	43108	tty1	S+	16:17	0:00	/usr/lib/chromium/chromium --type=zygote --crash
marijn	1697	0.0	0.0	34237688	16400	tty1	S+	16:17	0:00	/usr/lib/chromium/chromium --type=zygote --crash
marijn	1700	0.3	0.2	237724	139428	tty1	S+	16:17	0:19	Xwayland :1 -rootless -core -terminate 10 -liste
marijn	1720	1.9	0.3	34482056	246260	tty1	RL+	16:17	2:00	/usr/lib/chromium/chromium --type=gpu-process --
marijn	1725	0.3	0.1	34073356	85744	tty1	Sl+	16:17	0:21	/usr/lib/chromium/chromium --type=utility --util
marijn	1734	0.0	0.0	34297260	55712	tty1	Sl+	16:17	0:01	/usr/lib/chromium/chromium --type=utility --util
marijn	1772	0.0	0.0	34337420	30668	tty1	S+	16:17	0:00	/usr/lib/chromium/chromium --type=broker
marijn	1815	0.1	0.2	1187022588	146212	tty1	Sl+	16:17	0:12	/usr/lib/chromium/chromium --type=renderer --cra
marijn	2383	0.0	0.0	34037608	54396	tty1	Sl+	16:17	0:00	/usr/lib/chromium/chromium --type=utility --util
marijn	37887	0.2	0.2	1187127224	181740	tty1	Sl+	16:36	0:10	/opt/discord/Discord
marijn	37898	0.0	0.0	34101628	50432	tty1	S+	16:36	0:00	/opt/discord/Discord --type=zygote --no-zygote-s
marijn	37899	0.0	0.0	34101620	50560	tty1	S+	16:36	0:00	/opt/discord/Discord --type=zygote
marijn	37901	0.0	0.0	34101620	10832	tty1	S+	16:36	0:00	/opt/discord/Discord --type=zygote
marijn	37943	0.0	0.1	33930752	80280	tty1	Sl+	16:36	0:03	/opt/discord/Discord --type=utility --utility-su
marijn	37973	0.0	0.1	34354152	86100	tty1	Sl+	16:36	0:04	/opt/discord/Discord --type=gpu-process --crashp
marijn	38033	2.0	0.6	1204996736	445520	tty1	Sl+	16:36	1:43	/opt/discord/Discord --type=renderer --crashpad-
marijn	38073	0.0	0.0	33971648	62012	tty1	Sl+	16:36	0:00	/opt/discord/Discord --type=utility --utility-su
marijn	42247	0.0	0.0	609860	46224	tty1	Sl+	16:41	0:01	/usr/bin/thunar
marijn	43109	0.1	0.2	1187007228	137456	tty1	Sl+	16:44	0:06	/usr/lib/chromium/chromium --type=renderer --cra
marijn	65895	0.1	0.1	1186962524	116452	tty1	Sl+	17:38	0:01	/usr/lib/chromium/chromium --type=renderer --cra
marijn	65919	0.9	0.2	1188609956	162668	tty1	Sl+	17:38	0:12	/usr/lib/chromium/chromium --type=renderer --cra
marijn	67327	0.0	0.2	1186963072	135376	tty1	Sl+	17:38	0:00	/usr/lib/chromium/chromium --type=renderer --cra
marijn	67350	7.0	0.8	1190318396	563956	tty1	Sl+	17:38	1:30	/usr/lib/chromium/chromium --type=renderer --cra
marijn	67385	0.0	0.1	1186954136	121984	tty1	Sl+	17:39	0:00	/usr/lib/chromium/chromium --type=renderer --cra
marijn	67394	0.0	0.1	1186962328	114344	tty1	Sl+	17:39	0:00	/usr/lib/chromium/chromium --type=renderer --cra
marijn	67405	18.1	0.2	2889132	182236	tty1	RL+	17:39	3:51	kitty
marijn	67443	0.0	0.0	234948	9960	pts/0	Ss	17:39	0:00	/usr/bin/fish
marijn	67545	0.0	0.1	1186962396	117504	tty1	Sl+	17:39	0:00	/usr/lib/chromium/chromium --type=renderer --cra
marijn	68140	4.3	0.3	1187036256	230316	tty1	Sl+	17:39	0:54	/usr/lib/chromium/chromium --type=renderer --cra
marijn	73811	0.0	0.0	5556	3748	pts/0	S+	17:51	0:00	script
marijn	73812	0.0	0.0	242756	9372	pts/1	Ssl	17:51	0:00	fish -i
marijn	75600	0.0	0.0	94128	8064	tty1	Sl+	17:54	0:00	/usr/lib/libreoffice/program/oosplash --writer /
marijn	75617	0.3	0.4	1146524	291916	tty1	Sl+	17:54	0:01	/usr/lib/libreoffice/program/soffice.bin --write
marijn	75798	0.0	0.1	1186966388	129372	tty1	Sl+	17:55	0:00	/usr/lib/chromium/chromium --type=renderer --cra
marijn	75804	0.0	0.1	1186888176	67584	tty1	Sl+	17:55	0:00	/usr/lib/chromium/chromium --type=renderer --cra
marijn	78342	0.0	0.0	8512	5540	pts/1	R+	18:00	0:00	ps u a

```
~/Documents
A →
```


Opdracht 12.4

Ps aux

ps auxx --sort=pid | head -n 5

```
root      72762  0.0  0.0      0   0 ?        I   17:48   0:00 [kworker/6:0-cgroup_destroy]
root      72819  0.0  0.0      0   0 ?        I   17:48   0:00 [kworker/2:2-cgroup_destroy]
root      73192  0.0  0.0      0   0 ?        I   17:49   0:00 [kworker/14:1-cgroup_destroy]
root      73287  0.0  0.0      0   0 ?        I   17:50   0:00 [kworker/12:1-mm_percpu_wq]
root      73727  0.0  0.0      0   0 ?        I   17:51   0:00 [kworker/7:2-cgroup_destroy]
marijn    73811  0.0  0.0    5556  3748 pts/0    S+   17:51   0:00 script
marijn    73812  0.0  0.0  242756  9372 pts/1    Ssl  17:51   0:00 fish -i
root      74043  0.0  0.0      0   0 ?        I   17:51   0:00 [kworker/9:1-cgroup_destroy]
root      74887  0.0  0.0      0   0 ?        I   17:52   0:00 [kworker/3:0-cgroup_destroy]
root      75037  0.0  0.0      0   0 ?        I   17:53   0:00 [kworker/1:1-cgroup_destroy]
root      75087  0.0  0.0      0   0 ?        I   17:53   0:00 [kworker/13:1-cgroup_destroy]
root      75168  0.0  0.0      0   0 ?        I   17:54   0:00 [kworker/15:0-cgroup_destroy]
root      75246  0.0  0.0      0   0 ?        I   17:54   0:00 [kworker/11:0-cgroup_destroy]
root      75361  0.0  0.0      0   0 ?        I   17:54   0:00 [kworker/4:1-events]
marijn    75600  0.0  0.0   94128  8064 tty1     Sl+  17:54   0:00 /usr/lib/libreoffice/program/oosplash --v
marijn    75617  0.3  0.4  1146524 291916 tty1     Sl+  17:54   0:01 /usr/lib/libreoffice/program/soffice.bin
root      75772  0.0  0.0      0   0 ?        I   17:55   0:00 [kworker/8:1]
marijn    75798  0.0  0.1  1186966388 129372 tty1    Sl+  17:55   0:00 /usr/lib/chromium/chromium --type=rendere
marijn    75804  0.0  0.1  1186888176 67584 tty1    Sl+  17:55   0:00 /usr/lib/chromium/chromium --type=rendere
root      75890  0.0  0.0      0   0 ?        I   17:55   0:00 [kworker/14:2-mm_percpu_wq]
root      76098  0.0  0.0      0   0 ?        I   17:55   0:00 [kworker/2:0-cgroup_destroy]
root      76407  0.0  0.0      0   0 ?        I   17:55   0:00 [kworker/12:0-cgroup_destroy]
root      76432  0.0  0.0      0   0 ?        I   17:55   0:00 [kworker/6:2-cgroup_destroy]
root      77076  0.0  0.0      0   0 ?        I   17:56   0:00 [kworker/9:0-cgroup_destroy]
root      77130  0.0  0.0      0   0 ?        I   17:56   0:00 [kworker/10:2-cgroup_destroy]
root      77412  0.0  0.0   14816  6144 ?        S    17:57   0:00 systemd-userwork: waiting...
root      77438  0.0  0.0      0   0 ?        I   17:57   0:00 [kworker/7:1-events]
root      77476  0.0  0.0   14816  5888 ?        S    17:57   0:00 systemd-userwork: waiting...
root      77550  0.0  0.0      0   0 ?        I   17:57   0:00 [kworker/5:2-cgroup_destroy]
root      77907  0.0  0.0      0   0 ?        I   17:59   0:00 [kworker/0:1-cgroup_destroy]
root      77916  0.0  0.0      0   0 ?        I   17:59   0:00 [kworker/3:2-cgroup_destroy]
root      78112  0.0  0.0      0   0 ?        I   17:59   0:00 [kworker/11:2]
root      78187  0.0  0.0      0   0 ?        I   17:59   0:00 [kworker/4:2-events]
root      78273  0.0  0.0   14816  6016 ?        S    18:00   0:00 systemd-userwork: waiting...
root      78285  0.0  0.0      0   0 ?        I   18:00   0:00 [kworker/u64:4-events_unbound]
root      78286  0.0  0.0      0   0 ?        I   18:00   0:00 [kworker/u64:5]
marijn    78672  0.0  0.0   2668    516 tty1     S+   18:00   0:00 wl-copy --type image/png
marijn    78723  0.0  0.0   8512   5544 pts/1    R+   18:00   0:00 ps aux
```

~/Documents

Opdracht 13.1

```
~/Documents
→ uname; hostnamectl

Linux
Static hostname: archlinux
Icon name: computer-desktop
Chassis: desktop 🖥️
Machine ID: 0b43e9a9262848bda9162dc88f01ec8a
Boot ID: d60a16086fba443d9e909c683214a8eb
Operating System: Arch Linux
Kernel: Linux 6.8.9-arch1-2
Architecture: x86-64
Hardware Vendor: ASUS
Hardware Model: ROG STRIX B550-F GAMING _WI-FI_
Firmware Version: 3202
Firmware Date: Thu 2023-06-15
Firmware Age: 1y 2month 1w 4d

~/Documents
→
```

uname; hostnamectl

Opdracht 13.2

```
~/Documents
→ uname & hostnamectl hostname &

Linux
archlinux
```

uname & hostnamectl hostname &

Opdracht 13.3

```
~/Documents
└─▶ ping localhost &

PING localhost (::1) 56 data bytes
64 bytes from localhost (::1): icmp_seq=1 ttl=64 time=0.011 ms

~/Documents
└─▶ 64 bytes from localhost (::1): icmp_seq=2 ttl=64 time=0.017 ms
64 bytes from localhost (::1): icmp_seq=3 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=4 ttl=64 time=0.014 ms
64 bytes from localhost (::1): icmp_seq=5 ttl=64 time=0.015 ms
64 bytes from localhost (::1): icmp_seq=6 ttl=64 time=0.014 ms
64 bytes from localhost (::1): icmp_seq=7 ttl=64 time=0.015 ms
64 bytes from localhost (::1): icmp_seq=8 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=9 ttl=64 time=0.022 ms
64 bytes from localhost (::1): icmp_seq=10 ttl=64 time=0.016 ms
64 bytes from localhost (::1): icmp_seq=11 ttl=64 time=0.016 ms

ping localhost &
```

Opdracht 13.4

```
└─▶ job 64 bytes from localhost (::1): icmp_seq=8 ttl=64 time=0.016 ms
s jobs

Job      Group    CPU    State    Command
1        87976    0%     running ping localhost

└─▶ 64 bytes from localhost (::1): icmp_seq=9 ttl=64 time=0.016 ms
```

Cntrl z en dan bg

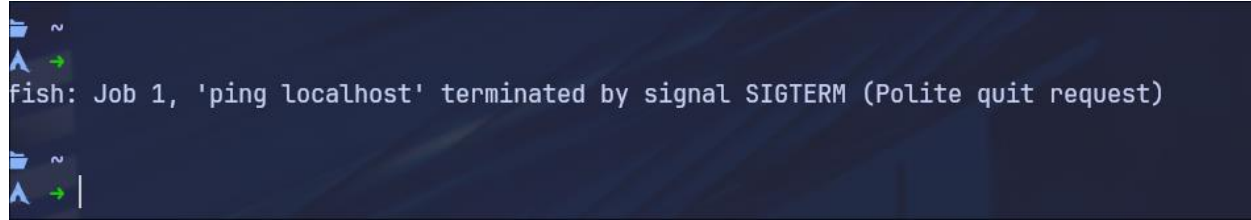
Opdracht 13.5

```
└─▶ ps

  PID TTY          TIME CMD
 88856 pts/2        00:00:00 fish
 88992 pts/2        00:00:00 ping
 89193 pts/2        00:00:00 ps
```

Dus pid is 88992 of jobs -p gebruiken

Opdracht 13.6

A terminal window with a dark blue background and a light blue pattern. The prompt is a fish shell icon followed by a tilde (~). The message displayed is: fish: Job 1, 'ping localhost' terminated by signal SIGTERM (Polite quit request). The prompt is followed by a green arrow and a vertical bar.|

```
fish: Job 1, 'ping localhost' terminated by signal SIGTERM (Polite quit request)
```

Kill 88992

2

kill %1

Zelfde effect

fg %1

Opdracht 14.1

Top

```
~  
^ → 64 bytes from localhost (::1): icmp_seq=92 ttl=64 time=0.015 ms  
64 bytes from localhost (::1): icmp_seq=93 ttl=64 time=0.012 ms  
64 bytes from localhost (::1): icmp_seq=94 ttl=64 time=0.020 ms  
64 bytes from localhost (::1): icmp_seq=95 ttl=64 time=0.011 ms  
64 bytes from localhost (::1): icmp_seq=96 ttl=64 time=0.016 ms  
64 bytes from localhost (::1): icmp_seq=97 ttl=64 time=0.016 ms  
64 bytes from localhost (::1): icmp_seq=98 ttl=64 time=0.014 ms  
64 bytes from localhost (::1): icmp_seq=99 ttl=64 time=0.026 ms  
64 bytes from localhost (::1): icmp_seq=100 ttl=64 time=0.017 ms  
64 bytes from localhost (::1): icmp_seq=101 ttl=64 time=0.018 ms  
top - 18:18:39 up 2:02, 1 user, load average: 0.50, 0.64, 0.64  
Tasks: 338 total, 1 running, 337 sleeping, 0 stopped, 0 zombie  
Cpu(s): 4.9 us, 0.7 sy, 0.0 ni, 94.1 id, 0.1 wa, 0.1 hi, 0.0 si, 0.0 st  
Mem: 64207.7 total, 50247.3 free, 3950.7 used, 10927.1 buff/cache  
Mem Swap: 4096.0 total, 4096.0 free, 0.0 used, 60257.0 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
68140	marijn	20	0	1132.0g	349492	125116	S	48.5	0.5	1:31.37	chromium
88818	marijn	20	0	2888184	182428	109420	S	20.6	0.3	0:15.09	kitty
829	marijn	20	0	894944	357120	125264	S	10.6	0.5	5:57.57	Hyprland
1720	marijn	20	0	32.9g	248712	116812	S	2.3	0.4	2:32.83	chromium
38033	marijn	20	0	1149.2g	464828	160040	S	1.0	0.7	2:18.93	Discord
90943	marijn	20	0	45768	37504	36352	S	1.0	0.1	0:00.03	slurp
1	root	20	0	21036	13540	9728	S	0.3	0.0	0:08.62	systemd
372	root	20	0	74652	26192	25168	S	0.3	0.0	0:01.92	systemd-journal
624	root	20	0	17300	8012	7040	S	0.3	0.0	0:00.68	systemd-logind
803	marijn	9	-11	120392	22984	8828	S	0.3	0.0	0:01.44	pipewire
807	marijn	9	-11	136752	40948	7448	S	0.3	0.1	0:19.36	pipewire-pulse
934	marijn	20	0	1873716	53720	39608	S	0.3	0.1	0:19.16	waybar
1678	marijn	20	0	32.8g	346948	216872	S	0.3	0.5	2:12.30	chromium
1700	marijn	20	0	237724	139564	79356	S	0.3	0.2	0:23.88	Xwayland
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_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	0:00.00	kworker/0:0H-events_highpri
13	root	0	-20	0	0	0	I	0.0	0.0	0:00.00	kworker/R-mm_pe
14	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_kthread
15	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_rude_kthread
16	root	20	0	0	0	0	I	0.0	0.0	0:00.00	rcu_tasks_trace_kthread
17	root	20	0	0	0	0	S	0.0	0.0	0:00.01	ksoftirqd/0
18	root	-2	0	0	0	0	I	0.0	0.0	0:00.51	rcu_preempt
19	root	-2	0	0	0	0	S	0.0	0.0	0:00.00	rcub/1

Opdracht 14.2

nice -n 10 top

```
top - 18:19:14 up 2:03, 1 user, load average: 0.51, 0.63, 0.64
Tasks: 336 total, 1 running, 335 sleeping, 0 stopped, 0 zombie
%Cpu(s): 2.3 us, 0.9 sy, 0.0 ni, 96.6 id, 0.1 wa, 0.1 hi, 0.0 si, 0.0 st
MiB Mem : 64207.7 total, 50372.3 free, 3823.9 used, 10930.6 buff/cache
MiB Swap: 4096.0 total, 4096.0 free, 0.0 used. 60383.8 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
829	marijn	20	0	903136	365308	133456	S	18.2	0.6	6:01.14	Hyprland
88818	marijn	20	0	2888184	182428	109420	S	13.6	0.3	0:18.88	Kitty
67350	marijn	20	0	1135.2g	593244	125872	S	4.6	0.9	2:14.11	chromium
1720	marijn	20	0	32.9g	249700	117308	S	2.3	0.4	2:34.26	chromium
91577	marijn	20	0	46524	40704	39168	S	2.3	0.1	0:00.07	slurp
38033	marijn	20	0	1149.2g	417804	160040	S	1.7	0.6	2:20.08	Discord
68140	marijn	20	0	1132.0g	243884	123972	S	1.0	0.4	1:35.38	chromium
1678	marijn	20	0	32.8g	348892	216908	S	0.7	0.5	2:12.92	chromium
1725	marijn	20	0	32.5g	86792	59896	S	0.7	0.1	0:29.83	chromium
225	root	0	-20	0	0	0	I	0.3	0.0	0:00.02	kworker/4:1H-kblockd
807	marijn	9	-11	136212	40560	7060	S	0.3	0.1	0:19.46	pipewire-pulse
1700	marijn	20	0	237724	139564	79356	S	0.3	0.2	0:24.03	Xwayland
67327	marijn	20	0	1132.0g	137572	102676	S	0.3	0.2	0:01.22	chromium
1	root	20	0	21036	13540	9728	S	0.0	0.0	0:08.64	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_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_d

Opdracht 14.3

```
~
A → ps aux | grep top
marijn      980  0.0  0.0 685108 11904 ?        Ssl  16:16   0:00 /usr/lib/xdg-desktop-portal
marijn      38033 2.2  0.6 1204991412 425100 tty1 S+   16:36   2:21 /opt/discord/Discord --type=renderer --crashpad-handler-pid=37915 --enable-crash-reporter=c980b2dc-6a2f-4c49-bb5d-a581ad297b28,no_channel --user-data-dir=/home/marijn/.config/discord --secure-schemes=disclip,sentry-ipc --bypasscsp-schemes=sentry-ipc --cors-schemes=sentry-ipc --fetch-schemes=disclip,sentry-ipc --app-path=/opt/discord/resources/app.asar --no-sandbox --no-zygote --autoplay-policy=no-user-gesture-required --disable-gpu-compositing --lang=en-US --num-raster-threads=4 --enable-main-frame-before-activation --renderer-client-id=7 --time-ticks-at-unix-epoch=-1724595368431436 --launch-time-ticks=1207920208 --shared-files=v8_context_snapshot_data:100 --field-trial-handle=3,i,590758447262415420,8246823778876275232,262144 --enable-features=kWebSQLAccess --disable-features=AllowAggressiveThrottlingWithWebSocket,HardwareMediaKeyHandling,IntensiveWakeUpThrottling,MediaSessionService,SpareRendererForSitePerProcess,UseEcoQoSForBackgroundProcess,WinRetrievalSuggestionsOnlyOnDemand --variations-seed-version --enable-node-leakage-in-renderers
marijn      87613 0.0  0.0  95756  8704 ?        Ssl  18:13   0:00 /usr/lib/xdg-desktop-portal-hyprland
marijn      92444 0.0  0.0   9616  7012 pts/0    S+   18:20   0:00 top
marijn      92469 0.0  0.0   6392  3984 pts/2    S+   18:20   0:00 grep --color=auto top

~
A → sudo renice -n -20 -p 92444
92444 (process ID) old priority 0, new priority -20

~
```

Eerst met `ps aux | grep top` om alle processen met top er in dna zie je dat pid 92444 de command top heeft en dan `sudo renice -n -20 -p 92444`

Opdracht 15

Stel ik maak de prioriteit van een auto hoger verplaatst deze sneller dan een auto die een minder hoge prioriteit heeft

```
#include <string>
#include <iostream>
#include <pthread.h>
#include <sched.h>
#include <unistd.h> // For sleep()

using namespace std;

class Car {
public:
    string name;
    double distPerRev;
    double position;
    bool brake;
    int priority;
    pthread_t threadId;

    Car(string name, double distPerRev, int priority)
    : name(name), distPerRev(distPerRev), priority(priority), position(0.0), brake(true), threadId(0) {}

    static void *drive(void *carrish) {
        Car *car = (Car *)carrish;
        while (!car->brake) {
            car->position += car->distPerRev; // Update position with distance per revolution
            usleep(50000); // Sleep for 50 milliseconds
        }
        return NULL;
    }

    // Start the car
    void start() {
        pthread_attr_t threadAttributes;
        struct sched_param schedulingParameters;

        pthread_attr_init(&threadAttributes);
        pthread_attr_setschedpolicy(&threadAttributes, SCHED_RR);
        pthread_attr_getschedparam(&threadAttributes, &schedulingParameters);
        schedulingParameters.sched_priority = priority;
        pthread_attr_setschedparam(&threadAttributes, &schedulingParameters);
        pthread_create(&threadId, &threadAttributes, drive, this);
        pthread_attr_destroy(&threadAttributes);
    }
};
```

```

brake = false;
}

void finish() {
brake = true;
pthread_join(threadId, NULL);
}
};

int main() {
int schedMin = sched_get_priority_min(SCHED_RR);
int schedMax = sched_get_priority_max(SCHED_RR);
cout << "min: " << schedMin << endl << "max: " << schedMax << endl;

Car electricCar("Tesla", 0.01, schedMin); // Minimum priority
Car combustionCar("Jaguar", 0.001, schedMax); // Maximum priority

electricCar.start();
combustionCar.start();

cout << "Race started" << endl;

cout << fixed;
cout.precision(1);
for (int sampleIndex = 0; sampleIndex < 10; sampleIndex++) {
cout << "Index: " << sampleIndex <<
'\t' << electricCar.name << " pos: " << electricCar.position <<
'\t' << combustionCar.name << " pos: " << combustionCar.position << endl;
sleep(1);
}

electricCar.finish();
combustionCar.finish();

cout << "Race finished. " << (electricCar.position > combustionCar.position ? electricCar.name :
combustionCar.name) << " wins!" << endl;

return 0;
}

```



```
Index: 3      Tesla pos: 0.1  Jaguar pos: 0.1
Index: 4      Tesla pos: 0.1  Jaguar pos: 0.1
Index: 5      Tesla pos: 0.1  Jaguar pos: 0.1
Index: 6      Tesla pos: 0.1  Jaguar pos: 0.1
Index: 7      Tesla pos: 0.1  Jaguar pos: 0.1
Index: 8      Tesla pos: 0.2  Jaguar pos: 0.2
Index: 9      Tesla pos: 0.2  Jaguar pos: 0.2
Race finished. Jaguar wins!
```

```
~/Documents via C v14.2.1-gcc 10s
→ g++ -o prio race_prio.cpp -lpthread
```

```
~/Documents via C v14.2.1-gcc
→ ./prio
min: 1
max: 99
Race started
Index: 0      Tesla pos: 0.0  Jaguar pos: 0.0
Index: 1      Tesla pos: 0.2  Jaguar pos: 0.0
Index: 2      Tesla pos: 0.4  Jaguar pos: 0.0
Index: 3      Tesla pos: 0.6  Jaguar pos: 0.1
Index: 4      Tesla pos: 0.8  Jaguar pos: 0.1
Index: 5      Tesla pos: 1.0  Jaguar pos: 0.1
Index: 6      Tesla pos: 1.2  Jaguar pos: 0.1
Index: 7      Tesla pos: 1.4  Jaguar pos: 0.1
```

Opdracht 16

Send_signal.c

```
1 #include <signal.h>
2 #include <stdio.h>
3 #include <stdlib.h>
4
5 int main (void) {
6 char input[10];
```

```

7 printf (" Enter process number : ");
8 int processNo = atoi ( fgets ( input , 10 , stdin ));
9 printf (" Sending signal SIGINT to process % d .\n " , processNo );
10 kill ( processNo , SIGINT );
11 return EXIT_SUCCESS ;
12 }

```

Catch_signal.c

```

#include <signal.h>
#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>

```

```

static void catch_function(int signo) {
    printf("Caught signal number %d.\n", signo);
}

```

```

int main(void) {
    printf("My process ID is %d.\n", getpid());
    if (signal(SIGINT, catch_function) == SIG_ERR) {
        fputs("An error occurred while setting a signal handler.\n", stderr);
        return EXIT_FAILURE;
    }
    printf("Signal handler set.\n");
    while (1);
}

```

Om het programma uit te berijden zou je

```

if (signal(SIGTERM, catch_function) == SIG_ERR) {
    fputs("An error occurred while setting a signal for sigterm.\n", stderr);
    return EXIT_FAILURE;
}
if (signal(SIGUSR1, catch_function) == SIG_ERR) {
    fputs("An error occurred while setting a signal for sigusr.\n", stderr);
    return EXIT_FAILURE;
}

```

Kunnen toevoegen

```
Enter process number : 111147
Sending signal SIGINT to process 111147.
```

```
~ via C v14.2.1-gcc 4s
```

```
→ jobs
```

```
jobs: There are no jobs
```

```
~ via C v14.2.1-gcc
```

```
→ |
```

```
~ via C v14.2.1-gcc
```

```
→ sudo nano send_signal.c
```

```
~ via C v14.2.1-gcc 12s
```

```
→ gcc -o catch_signal catch_signal.c
```

```
gcc -o send_signal send_signal.c
```

```
send_signal.c: In function 'main':
```

```
send_signal.c:9:55: warning: unknown escape sequence: '\040'
```

```
9 | printf (" Sending signal SIGINT to process % d .\ n " , processNo );
```

```
~ via C v14.2.1-gcc
```

```
→ sudo nano send_signal.c
```

```
~ via C v14.2.1-gcc 37s
```

```
→ gcc -o catch_signal catch_signal.c
```

```
gcc -o send_signal send_signal.c
```

```
~ via C v14.2.1-gcc
```

```
→ ./catch_signal
```

```
My process ID is 111147.
```

```
Signal handler set.
```

```
Caught signal number 2.
```


Opdracht 17

Receivemessage.c

```
#include <stdio.h>
#include <sys/ipc.h>
#include <sys/msg.h>
#include <unistd.h>
#define MESS_LEN 100

int main() {
    struct mesg_buffer {
        long mesg_type;
        char mesg_text[MESS_LEN];
    } message;

    key_t key = ftok("ipc", 1);

    int msgid = msgget(key, 0666 | IPC_CREAT);

    while (1) {
        if (msgrcv(msgid, &message, MESS_LEN, 0, IPC_NOWAIT) == -1) {
            printf("No message in queue.\n");
            sleep(1); // Wacht 1 seconde voordat je opnieuw probeert
        } else {
            printf("Data received is: %s\n", message.mesg_text);
        }
    }

    return 0;
}
```

```
welcome to fish, the friendly interactive shell
Type help for instructions on how to use fish
[WARN] - (starship::config): Error in 'StarshipRoot' at 'theme': Unknown
[WARN] - (starship::config): Error in 'Shell' at 'bash': Unknown key (Did

~ via C v14.2.1-gcc
➤ → ./send_message

fish: Unknown command: ./send_message

~ via C v14.2.1-gcc
➤ → cd Documents/

~/Documents via C v14.2.1-gcc
➤ → ./send_message

Type message : minecraft B)
Data sent is : minecraft B)

Type message :

~/Documents via C v14.2.1-gcc
➤ → ./receive_message

No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.
Data received is: minecraft B)

No message in queue.
No message in queue.
No message in queue.
No message in queue.
No message in queue.

```

Als je het dan runt