Template Week 5 – Operating Systems

Student number:574642

Assignment 5.1: Unix-like

a) Find out what the difference is between UNIX and unix-like operating systems?

Echte UNIX systemen slagen de speceficatie testen door The Open Group, waar unix-like systems dat niet doen, ze lijken dus op UNIX systemen maar hebben niet het trademark.

b) Study the image above named UNIX timeline. Find out who Ken Thompson, Dennis Ritchie, Bill Joy, Richard Stallman, and Linus Torvalds are and what they have contributed to the development of UNIX or unix-like systems and to IT in general. TIP! English-language sources often contain more detailed information about these individuals.

Ken Thompson & dennis Ritchie hebben UNIX gemaakt. Bill joy heeft geholpen bij het maken van UNIX (BSD). Richard stallman heeft GNU gemaakt, een geïnspireerde gratis versie van UNIX. En Linus Torvalds heeft linux bedacht, een gratis kernel die ook geïnspireerd is van UNIX.

c) What is the philosophy of the GNU movement?

"*Free software* means that the software's users have freedom. (The issue is not about price.) We developed the GNU operating system so that users can have freedom in their computing."

d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.

Ja voor een deel, voor persoonlijk gebruik is het helemaal gratis echter niet voor commercieel gebruik. Het is echter wel volledig open souce.

e) Find out what is the Windows Subsystem for Linux?

WSL is het windows subsystem voor linux.

f) Find out, which operating system family belongs to Android, iOS and ChromeOS?

Ze hebben alle 3 UNIX like operating systems, Android gebruikt Linux kernel als base

IOS gebruikt Apple omdat de basis Darwin een UNIX (BSD) achtergrond heeft.

ChromeOS gebruikt ook Linux kernel.

Assignment 5.2: Supercomputers and gameconsoles

a) Research on this site what supercomputers are used for and write a short summary of it:
https://www.computerhistory.org/timeline/search/?q=Supercomputer

De eerste Linux supercomputer werdt gemaakt door David A. en werdt gebruikt als prototype voor het RoadRunner project om de eerste echte linux supercomputer voor open use te maken.

De ASCI Red werdt gebruikt om de US nuclear arsenal te onderhouden. De earth simulator is door de japanse overheid gemaakt om klimaat modellen van de wereld te maken. De intel paragon werdt gemaakt om atmospeer en oceaan onderzoek te ondersteunen. De Deep Blue werdt gebruikt om Garry Kasparov te verslaan in een schaak tournement.

b) IBM is a company that has already built a number of supercomputers. One of them is IBM's Roadrunner. The CPU developed for this supercomputer was further developed at a later stage as the CPU for the PlayStation 3 console. Find out what a **PlayStation 3 cluster** is and what it was used for? Een PlayStation 3 cluster zijn meerdere playstation 3's aan elkaar gelinked om op die manier een soort super computer te maken, je kan het gebruiken voor onderzoeken, ai image generation, en wordt vooral gebruikt als een goedkope oplossing voor super computers.

c) You can build a supercomputer by putting a few computers together in a cluster. Here's what Oracle did with a collection of Raspberry Pi's, for example:
https://blogs.oracle.com/developers/post/building-the-worlds-largest-raspberry-pi-cluster
What specific operating system is running on this cluster?

Oracle Linux for ARM

d) Does Oracle's Raspberry Pi supercomputer appear in the list of the 500 fastest supercomputers in the world? Make a logical decision for this, without going through the entire list.
https://www.top500.org/lists/top500/list/2023/06/
Nee want alleen de laagste op die lijst alleen al heeft meer dan 40.000 cores terwijl 1 raspbarry pi tussen de 1 en 4 cores heeft 1050 pi's zouden dus tussen de 1050 en 5000 cores hebben wat nog lang niet bij de 40000 is.

e) What CPU architecture is used for the PlayStation 5 and Xbox Series X?
What operating systems run on these consoles?
What conclusion can you draw from the answer to the previous question?

Beide AMD Zen 2 architecture
Playstation gebruikt Orbis OS, Xbox series X gebruikt een versie van microsoft windows
Dat de AMD Zen 2 blijkbaar heel goed is omdat ze die beide hebben maar dat de bedrijven toch graag zelf een operating system kiezen of maken.

Assignment 5.3: Working with Windows

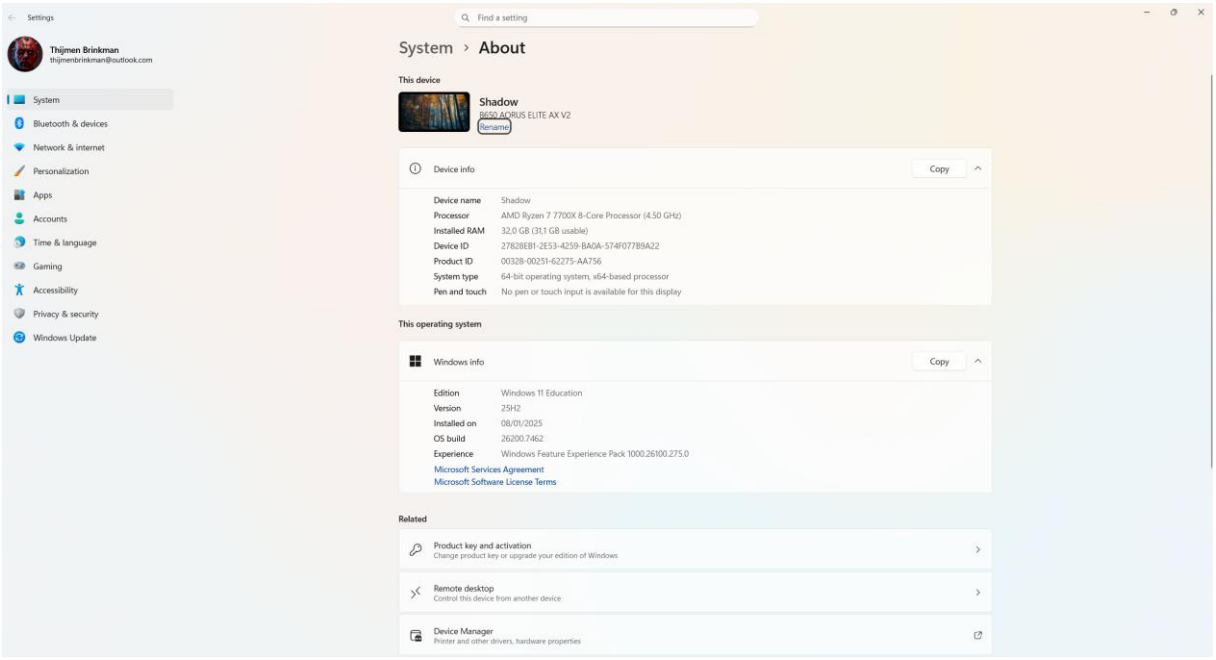
Take relevant screenshots of the assignments below

a) Practice for about 10 minutes with the ⊞ keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.

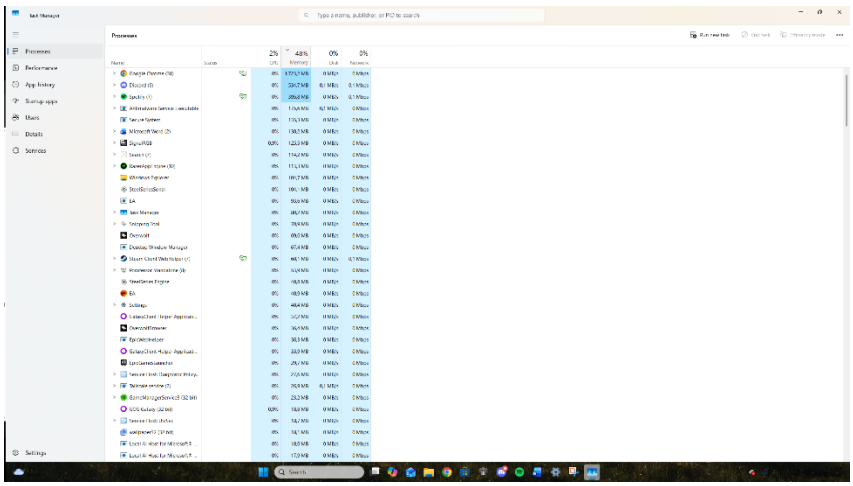
b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?

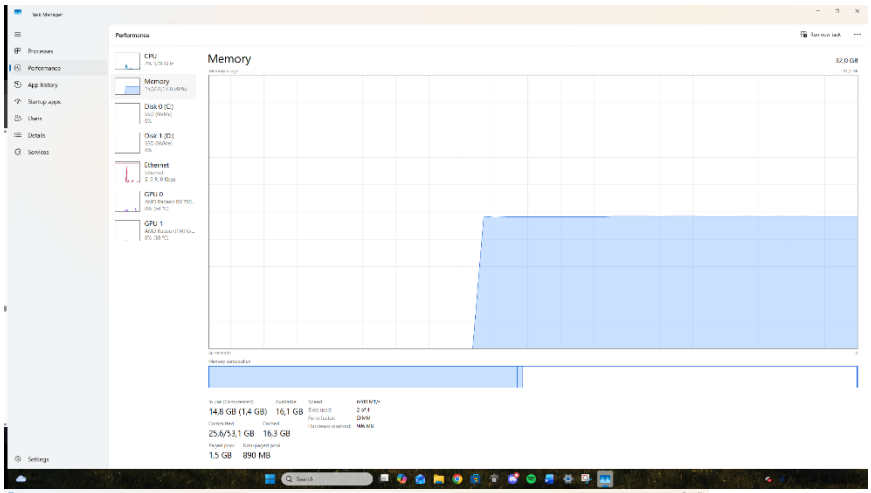
Windows toets + X daarna E

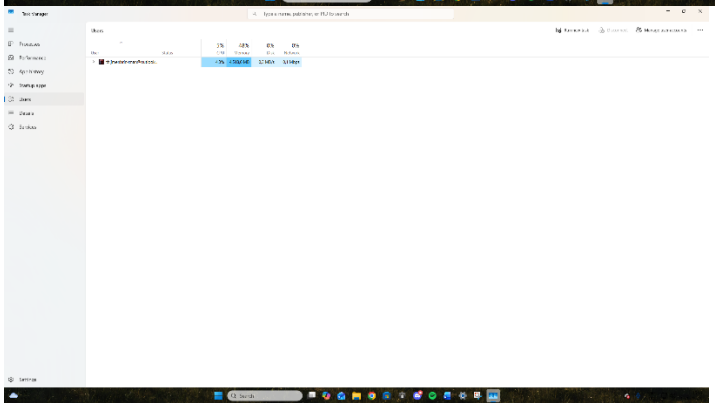
c) Open the system properties with a ⊞ key combination, take a screenshot of the open screen. Paste this screenshot into this template.



d) Open task manager with a key combination. Take screenshots of the tabs: processes (shows active processes), performance, and users. Place these three screenshots in this template.

e) 

f) 

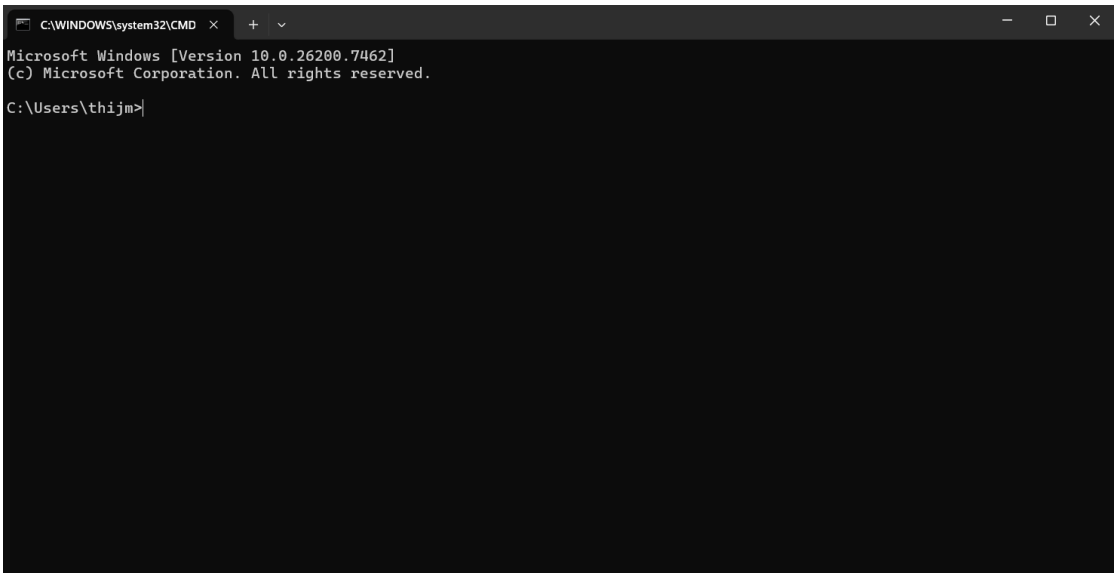
g) 

h) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector, or the second screen. Which key combination should you use for this?

Je zou eerst windows + tab kunnen doen om te kijken wat waar open staat, en als je dan tab ingedrukt houdt kan je door scrollen om te switchen.

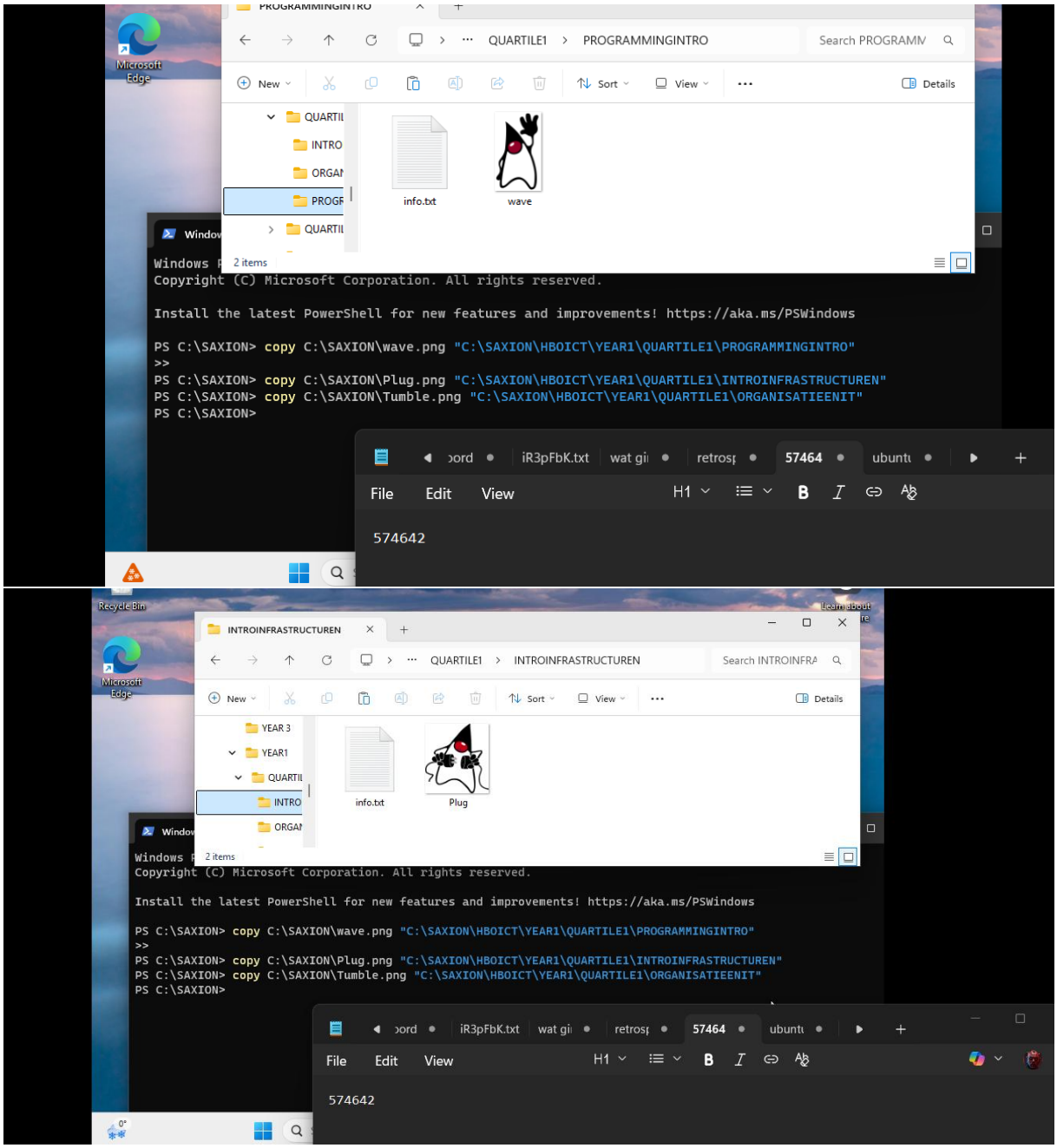
i) If you leave the classroom for a while and you leave your laptop behind, it is wise to lock the screen. Your Apps will continue to run in the background. So, for example, if you're waiting for a download that takes a while, lock the screen and get a cup of coffee. Which key combination do you use for this? Windows + L

j) Open the Run screen with a key combination. On this screen, type CMD and press <enter>. Take a screenshot of this result and paste it into this template.

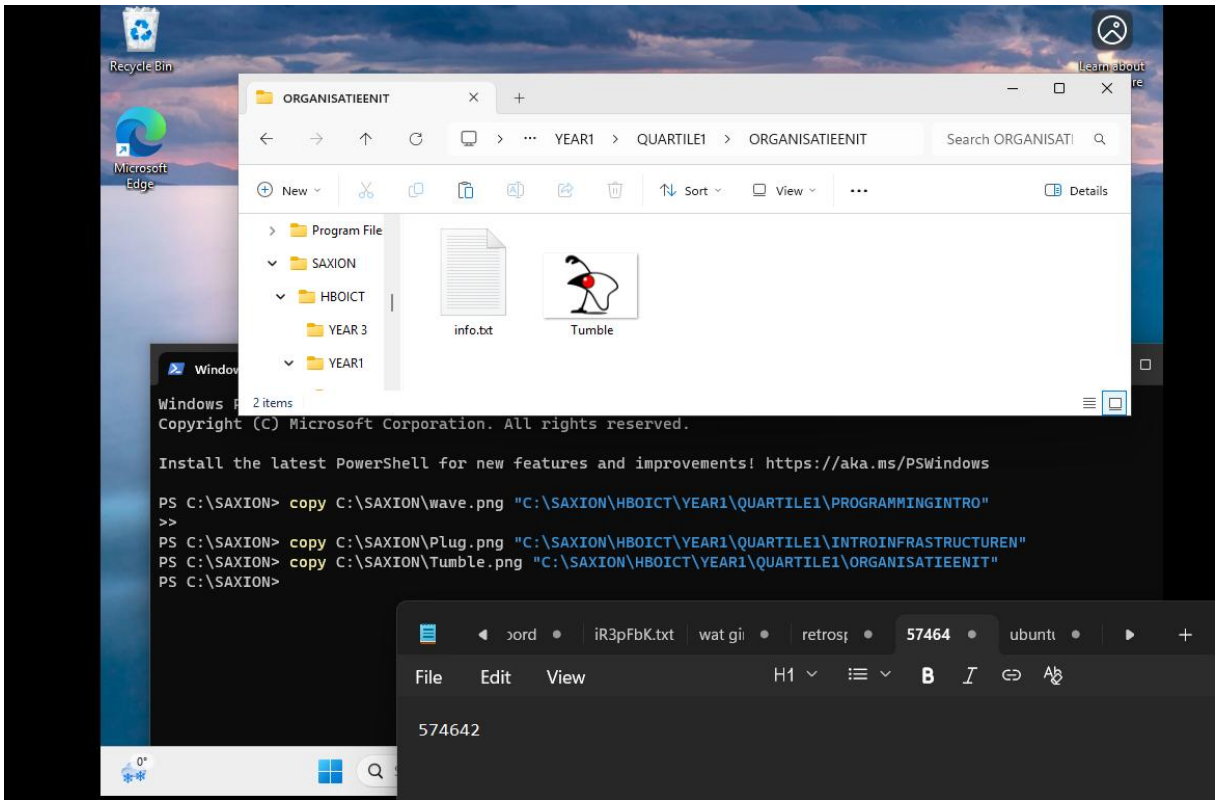


Working in the File Explorer

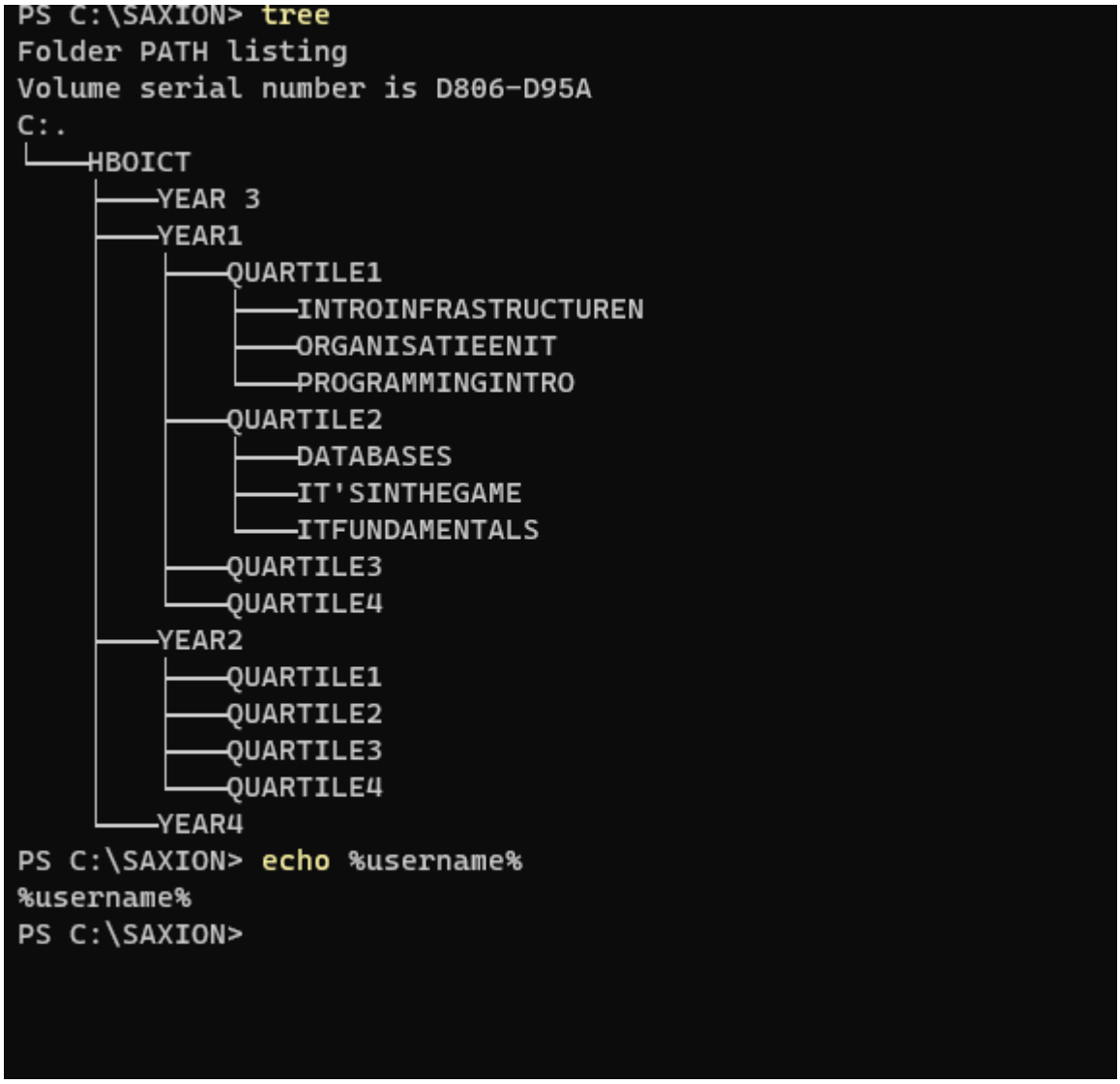
Relevant screenshots **copy** command:


QUARTILE1 › PROGRAMMINGINTRO
Search PROGRAMM
New
Sort
View
Details
info.txt
wave
2 items
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\SAXION> copy C:\SAXION\wave.png "C:\SAXION\HBOICT\YEAR1\QUARTILE1\PROGRAMMINGINTRO"
>>
PS C:\SAXION> copy C:\SAXION\Plug.png "C:\SAXION\HBOICT\YEAR1\QUARTILE1\INTROINFRASTRUCTUREN"
PS C:\SAXION> copy C:\SAXION\Tumble.png "C:\SAXION\HBOICT\YEAR1\QUARTILE1\ORGANISATIEENIT"
PS C:\SAXION>
iR3pFbK.txt
57464
ubuntu
File
Edit
View
H1
574642

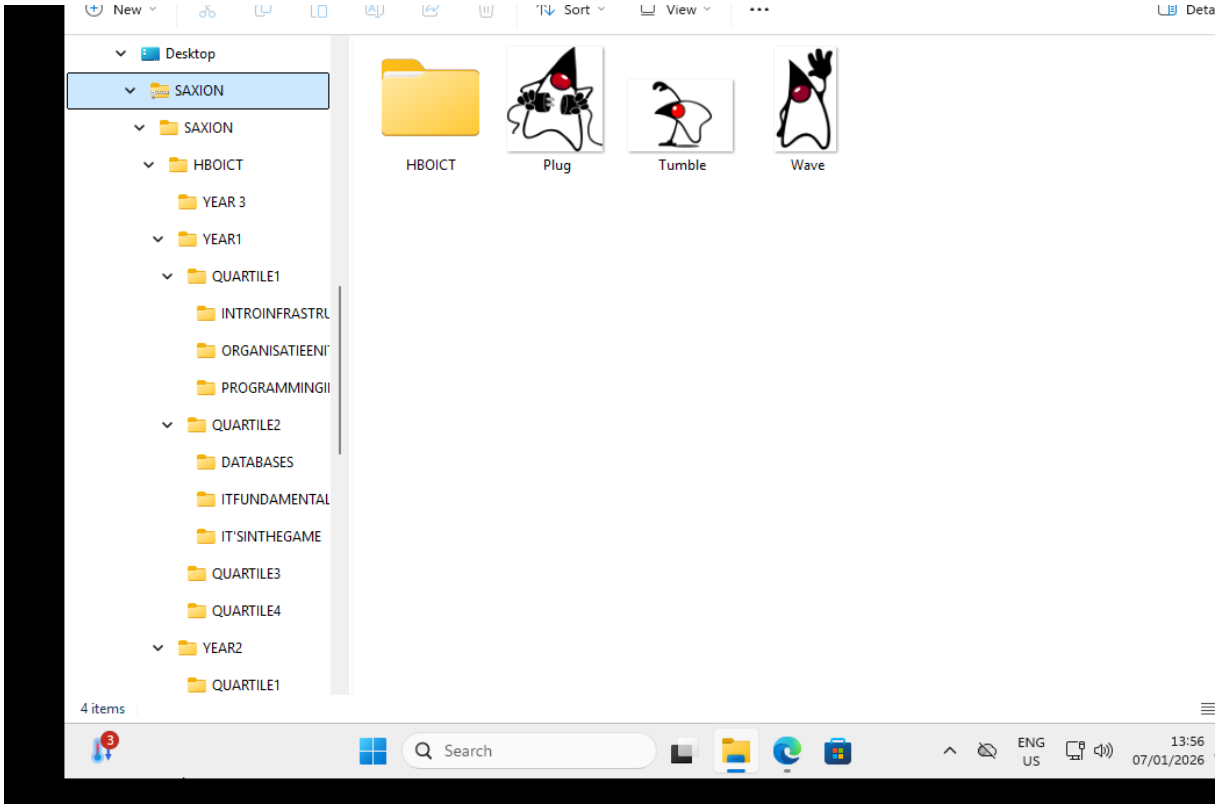
Recycle Bin
Microsoft Edge
INTROINFRASTRUCTUREN
QUARTILE1 › INTROINFRASTRUCTUREN
Search INTROINFRA
New
Sort
View
Details
YEAR 3
YEAR1
info.txt
Plug
2 items
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows
PS C:\SAXION> copy C:\SAXION\wave.png "C:\SAXION\HBOICT\YEAR1\QUARTILE1\PROGRAMMINGINTRO"
>>
PS C:\SAXION> copy C:\SAXION\Plug.png "C:\SAXION\HBOICT\YEAR1\QUARTILE1\INTROINFRASTRUCTUREN"
PS C:\SAXION> copy C:\SAXION\Tumble.png "C:\SAXION\HBOICT\YEAR1\QUARTILE1\ORGANISATIEENIT"
PS C:\SAXION>
iR3pFbK.txt
57464
ubuntu
File
Edit
View
H1
574642



Relevant screenshots **tree** command:

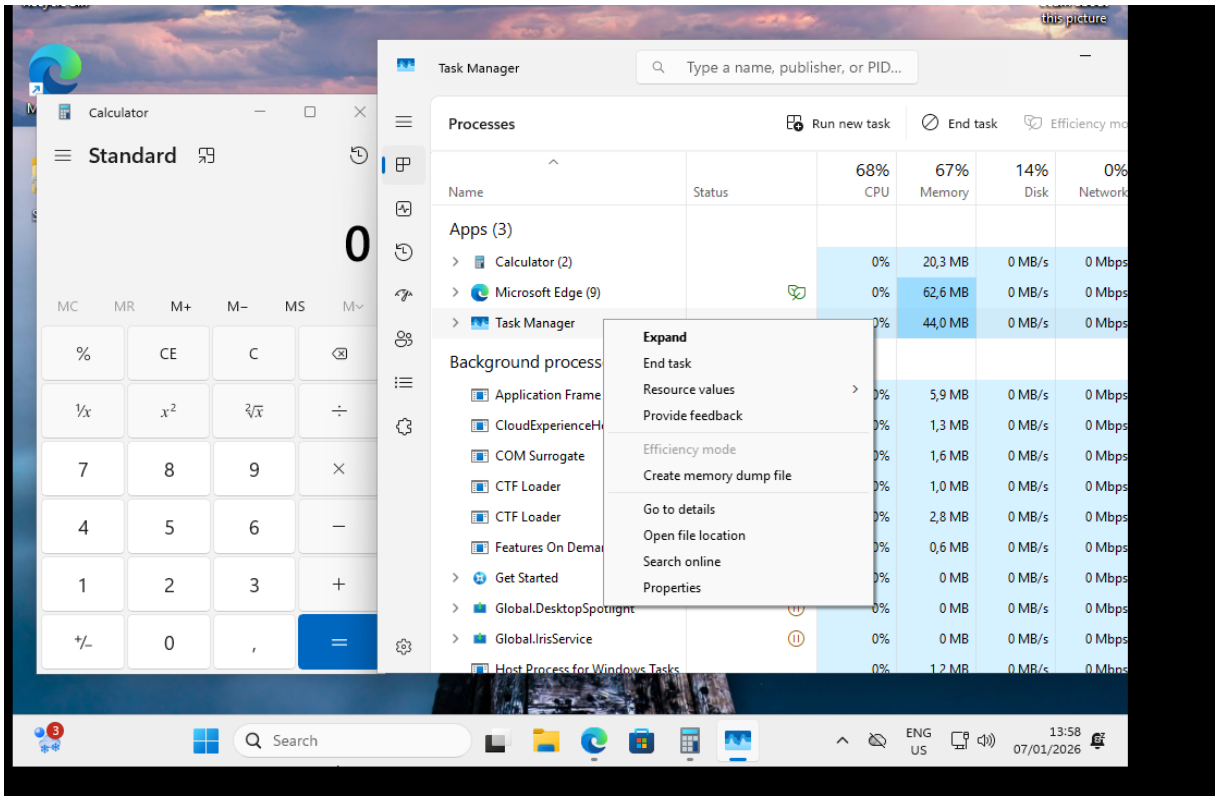


Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



Terminating Processes

Relevant Screenshots Task Manager Window:



Install Software

Wat doet het commando:

Winget = windows package manager

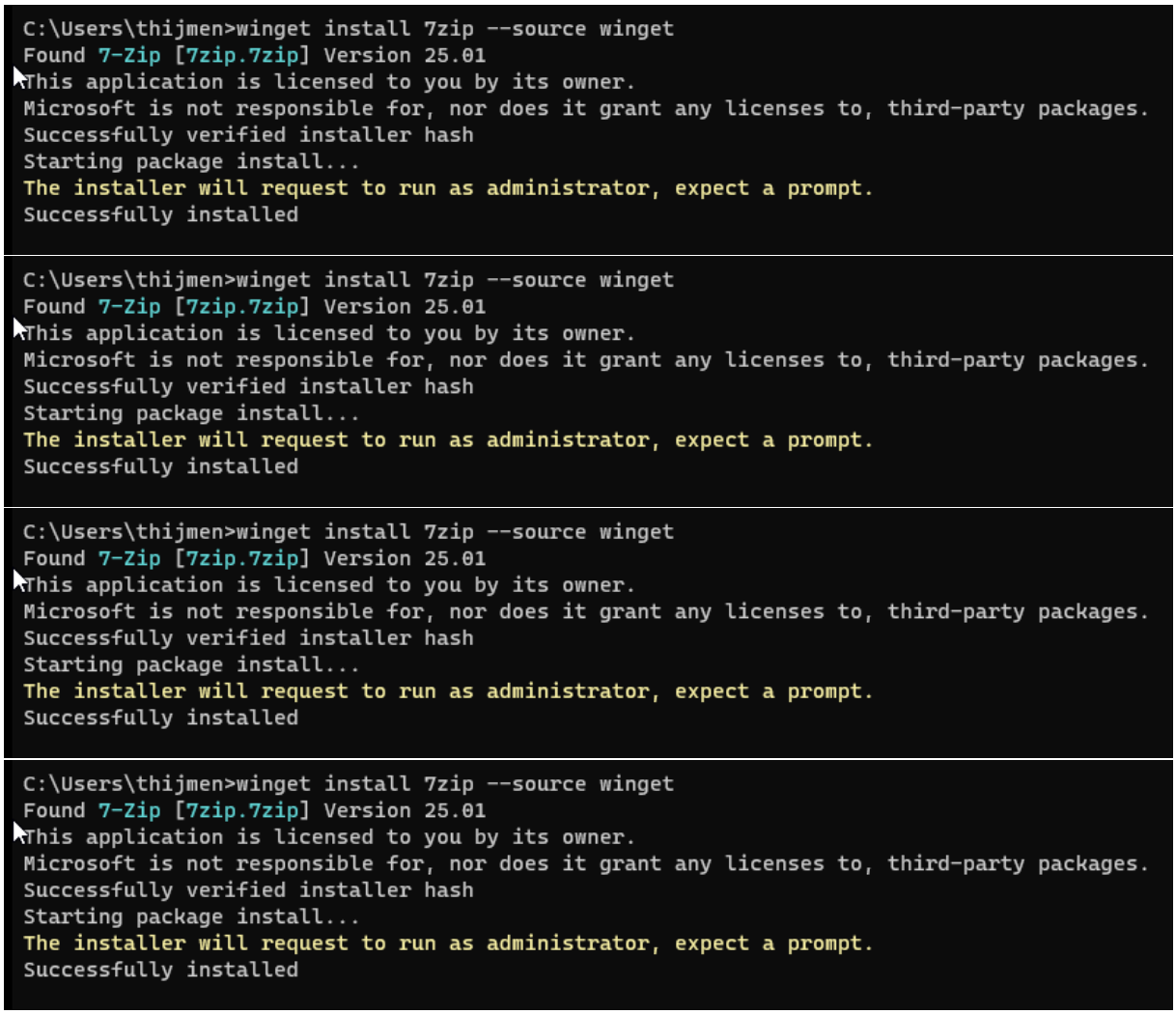
Install = install an application

E: zoek naar exacte match

--id = een uniek id in dit geval Mozilla.Firefox

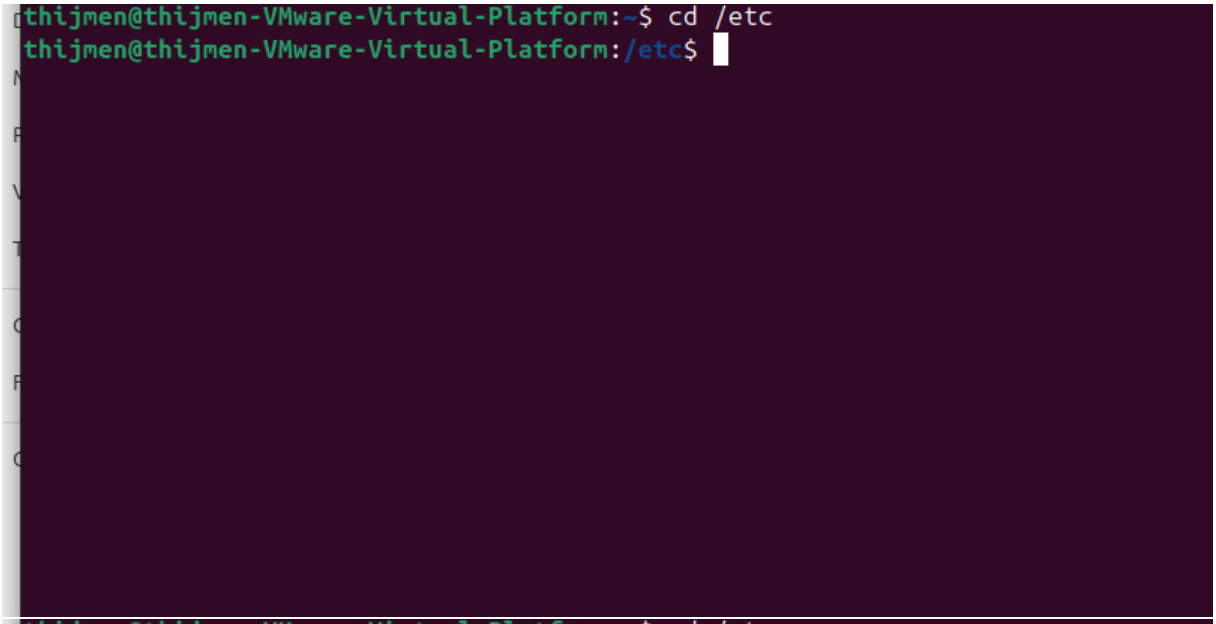
Relevant screenshots that the following software is installed with winget:

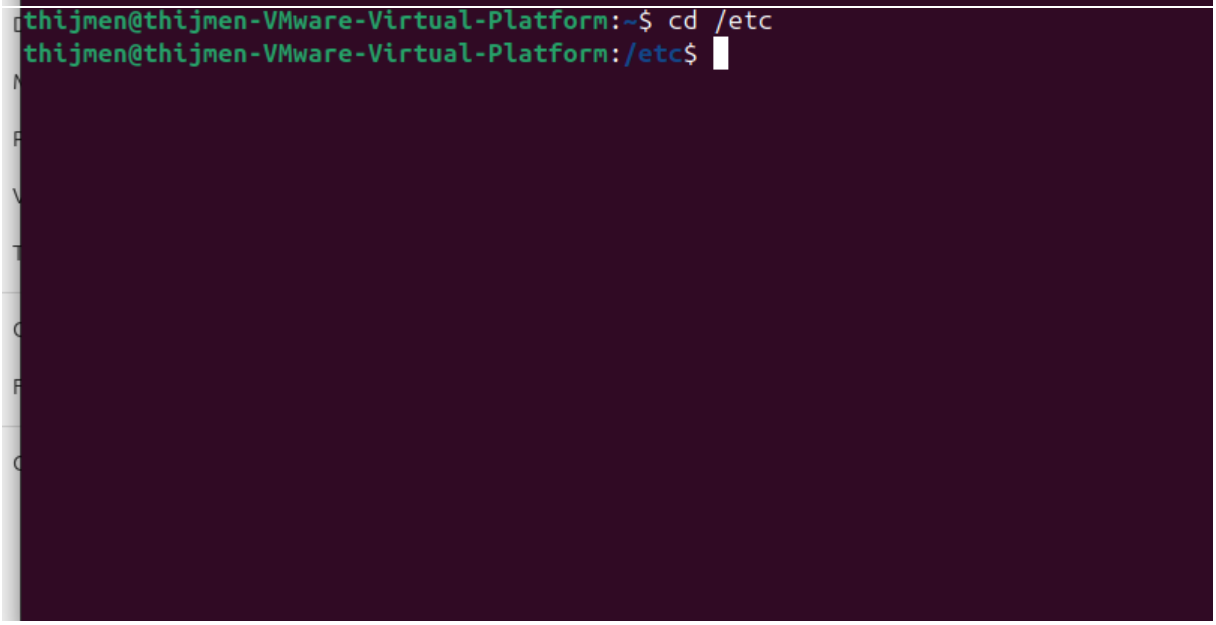
- WinSCP
- Notepad++
- 7zip


C:\Users\thijmen>winget install 7zip --source winget
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator, expect a prompt.
Successfully installed
C:\Users\thijmen>winget install 7zip --source winget
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator, expect a prompt.
Successfully installed
C:\Users\thijmen>winget install 7zip --source winget
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator, expect a prompt.
Successfully installed
C:\Users\thijmen>winget install 7zip --source winget
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator, expect a prompt.
Successfully installed

Assignment 5.4: Working with Linux

Relevant screenshots + motivation





Navigeren naar /etc folder in file explorer en terminal

How to get back to your home folder in the terminal?

Cd~

Name one significant difference in Linux's file structure when comparing it to Windows

Linux gebruikt een hooftdirectory / terwijl Windows meerdere kan gebruiken C:\ of D:\ bijvoorbeeld

What is the /etc directory usually used for?

Het is een map met bestanden voor de configuratie van systemen en applicaties

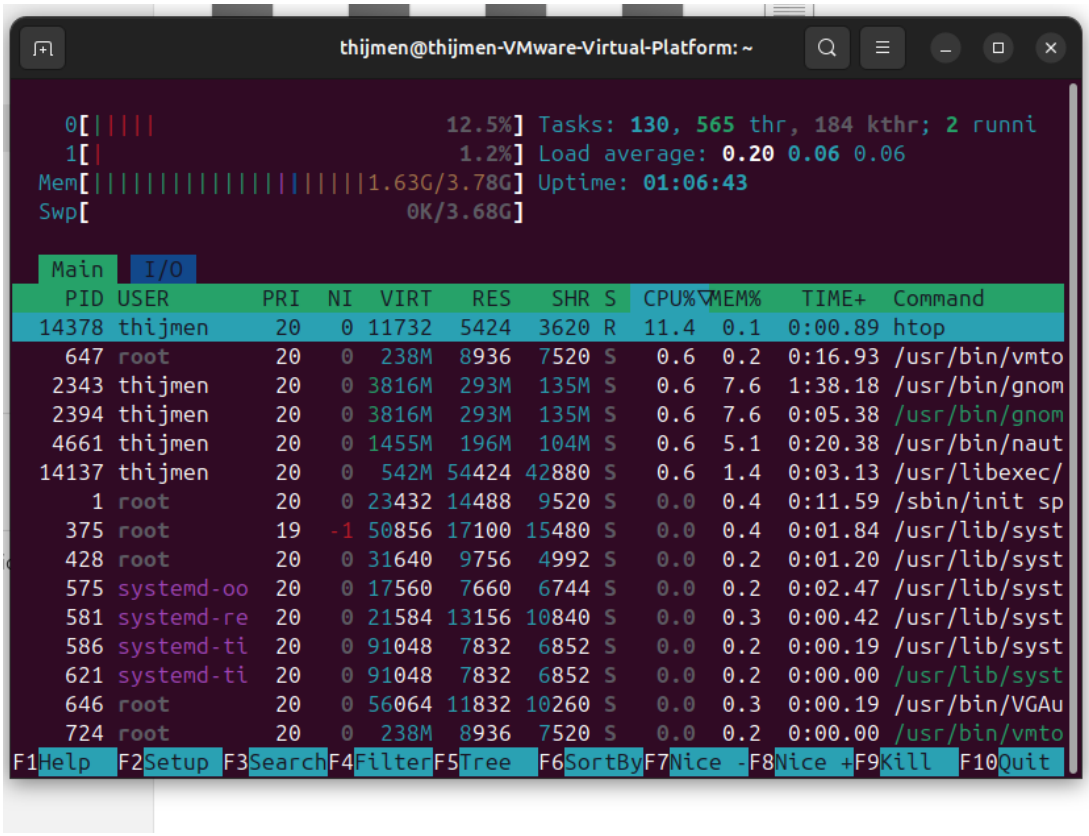
Which command in the terminal would you use to compress a text file into a tar archive?

tar -cvf bestand.tar testbestand.txt

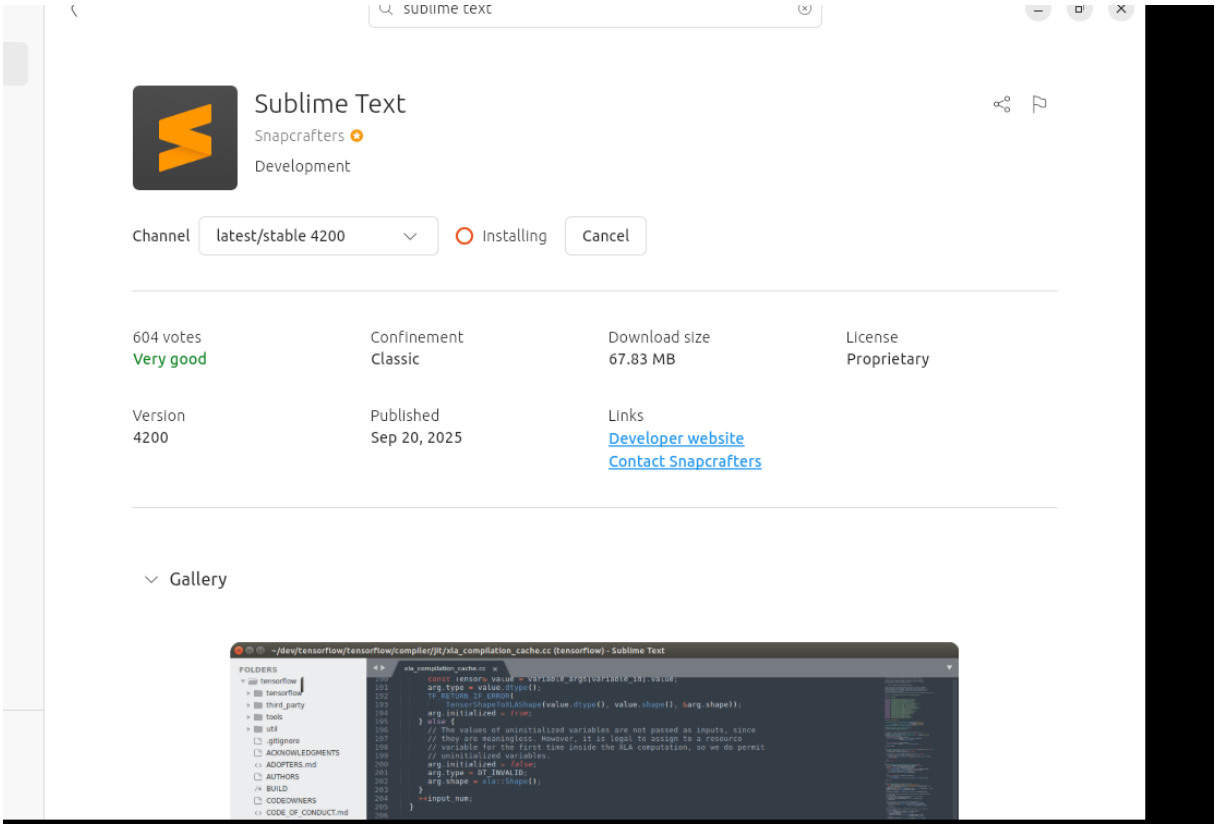
With which command in the terminal would you be able to extract a tar file?

Tar –xvf bestand.tar

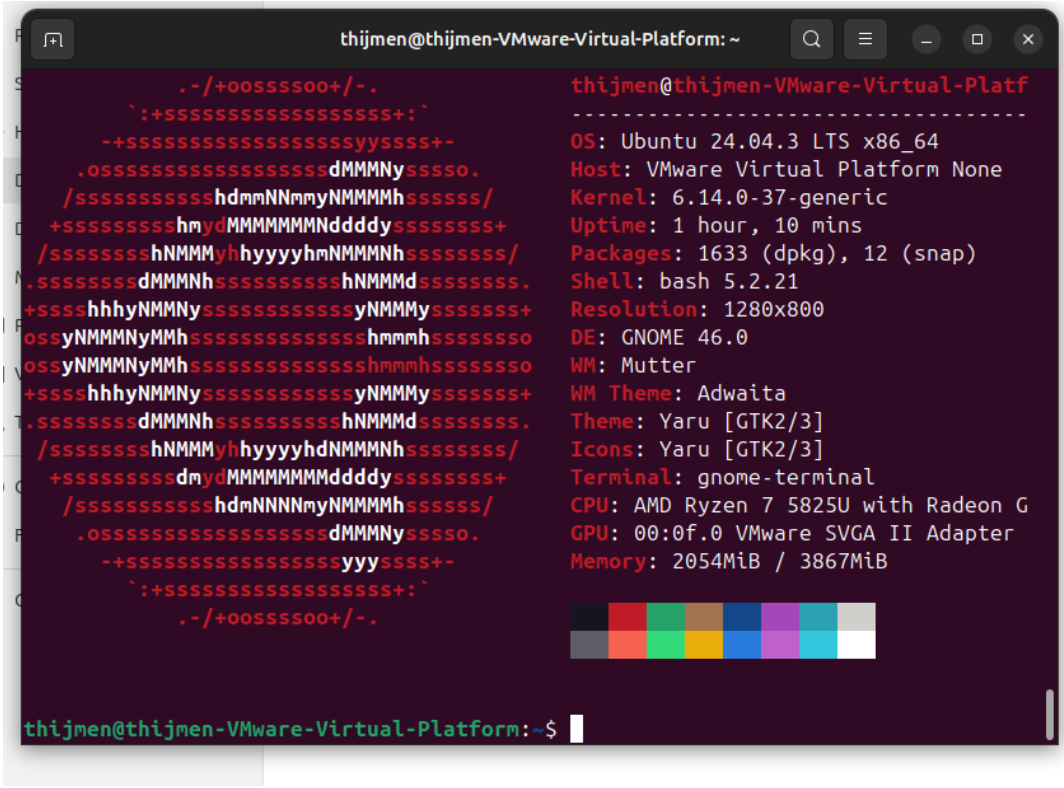
Compress a text file in a tar archive and compress it with gzip.



Hier zie je dat htop is geinstalleerd. Het laat zien wat er allemaal draait op dit moment met de cpu usage en geheugen.



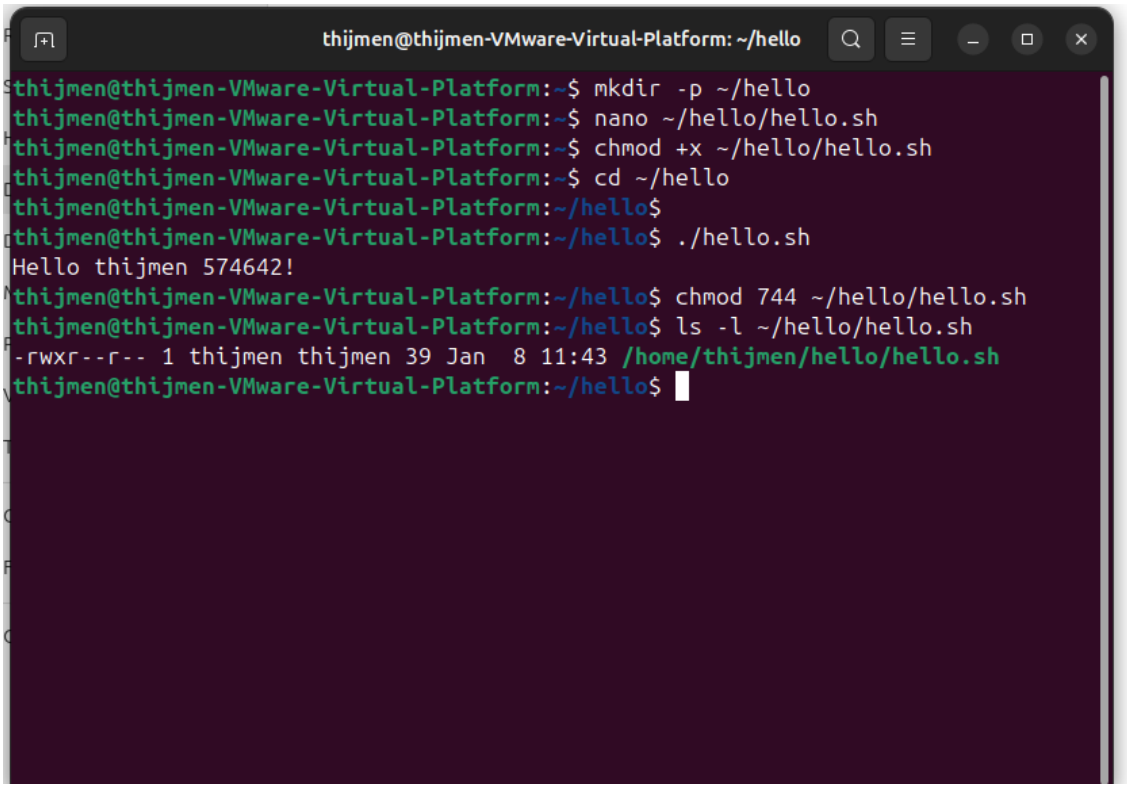
Hier zie je dat ik sublime text aan het installen ben



Hier zie je dat neofetch is geinstalled via de terminal, wat deze applicatie laat zien is bijvoobeeld je OS versie, host, kernel versie, uptime enz,

Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation



Hierboven alle gebruikete commands

Assignment 5.6: View the contents of files

Relevant screenshots + motivation

What does each of these commands do? Write it out for yourself.

Cat: Laat de inhoud van een bestand zien

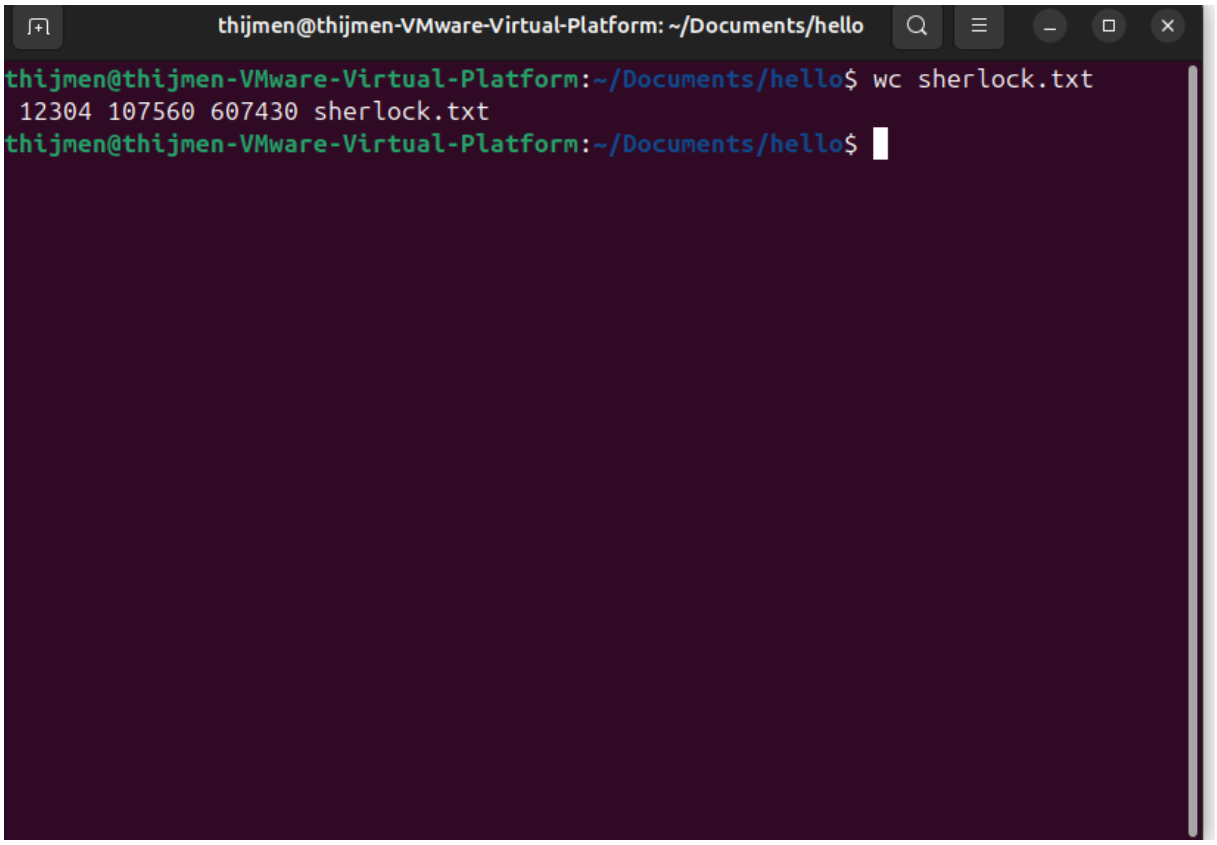
Wc: daarmee kan je het aantal woorden, regels en karakters van een bestand laten zien

Less: laat de inhoud van een bestand per pagina zien

Tail: Toont de laatste regels van een bestand

Head: toont de eerste regel van een bestand

Grep: zoekt naar bepaalde woorden in een bestand en laat ook de regels zien waar de woorden voorkomen.



Hier zie je het aantal regels woorden en karakters

Hier zie je hoevaak en waar het woord kingdom voorkomt

```
thijmen@thijmen-VMware-Virtual-Platform:~/Documents/hello$ head -n 500 sherlock.
txt | tail -n 20

“Pray do so. I shall be all anxiety.”

“Then, as to money?”

“You have _carte blanche_.”

“Absolutely?”

“I tell you that I would give one of the provinces of my kingdom to
have that photograph.”

“And for present expenses?”

The King took a heavy chamois leather bag from under his cloak and laid
it on the table.

“There are three hundred pounds in gold and seven hundred in notes,” he
said.

thijmen@thijmen-VMware-Virtual-Platform:~/Documents/hello$
```

Hier zie je de 10 regels boven het woord kingdom

Assignment 5.7: Digital forensics

Relevant screenshots + motivation

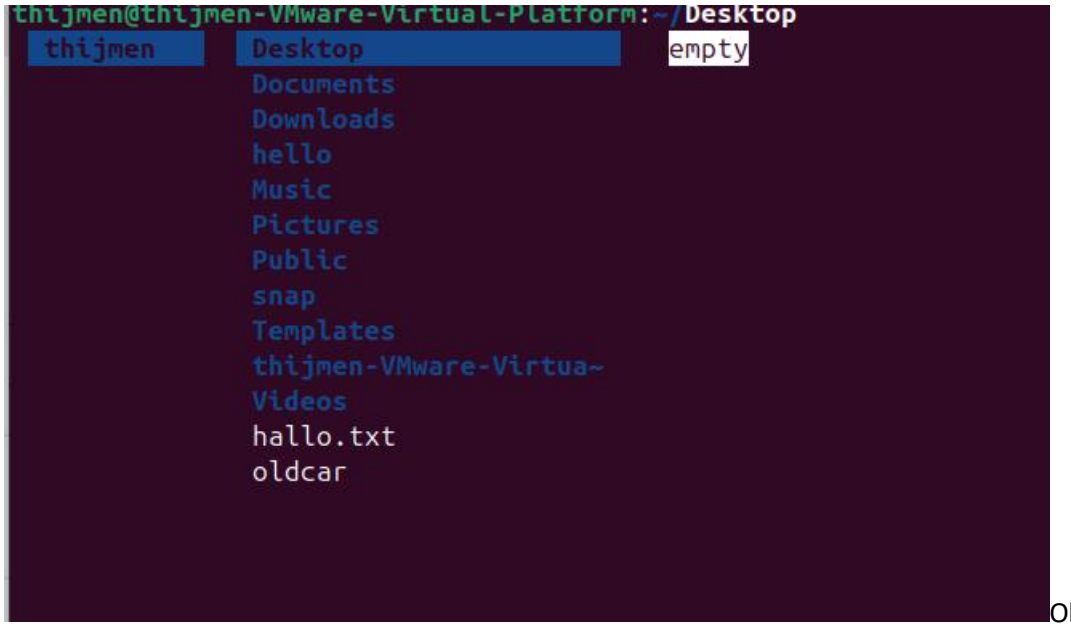
```
File Name                       : oldcar.jpeg
Directory                       : /home/thijmen
File Size                       : 2.4 MB
File Modification Date/Time     : 2026:01:08 12:02:39+01:00
File Access Date/Time           : 2026:01:08 12:05:09+01:00
File Inode Change Date/Time     : 2026:01:08 12:14:15+01:00
File Permissions                : -rw-rw-r--
File Type                       : JPEG
File Type Extension             : jpg
MIME Type                       : image/jpeg
JFIF Version                    : 1.01
Exif Byte Order                 : Big-endian (Motorola, MM)
Make                            : motorola
Camera Model Name               : moto g(6) play
X Resolution                    : 72
Y Resolution                    : 72
Resolution Unit                 : inches
Software                        : aljeter-user 9 PPPS29.55-35-18-7 6a0d0 release-keys
Modify Date                     : 2020:11:07 15:08:57
Y Cb Cr Positioning             : Centered
Exposure Time                   : 1/33
F Number                        : 2.0
Exposure Program                : Program AE
ISO                             : 64
Exif Version                    : 0220
Date/Time Original              : 2020:11:07 15:08:57
Create Date                     : 2020:11:07 15:08:57
Components Configuration        : Y, Cb, Cr, -
Shutter Speed Value             : 1/33
Aperture Value                  : 2.0
Brightness Value                : -1
Exposure Compensation           : 0
Max Aperture Value              : 2.0
```

Hier zie je dat het door motorola gemaakt is

```
Saturation                      : Low
Sharpness                       : Soft
GPS Version ID                  : 2.2.0.0
GPS Latitude Ref                : North
GPS Longitude Ref               : East
GPS Altitude Ref                : Above Sea Level
GPS Time Stamp                  : 14:08:57
GPS Map Datum                   : WGS-84
GPS Processing Method           : ASCII
GPS Date Stamp                  : 2020:11:07
Compression                     : JPEG (old-style)
Thumbnail Offset                : 2862
Thumbnail Length                : 59453
Image Width                     : 4160
Image Height                    : 3120
Encoding Process                : Baseline DCT, Huffman coding
Bits Per Sample                 : 8
Color Components                : 3
Y Cb Cr Sub Sampling            : YCbCr4:2:0 (2 2)
Aperture                        : 2.0
Image Size                      : 4160x3120
Megapixels                      : 13.0
Shutter Speed                   : 1/33
Thumbnail Image                 : (Binary data 59453 bytes, use -b option to extract)
GPS Altitude                    : 42 m Above Sea Level
GPS Date/Time                   : 2020:11:07 14:08:57Z
GPS Latitude                    : 53 deg 11' 39.68" N
GPS Longitude                   : 6 deg 32' 12.90" E
Focal Length                    : 3.5 mm
GPS Position                    : 53 deg 11' 39.68" N, 6 deg 32' 12.90" E
Light Value                     : 7.7
thijmen@thijmen-VMware-Virtual-Platform:~$
```

Hier zie je de locaties van de foto’s

De locatie van de gemaakte foto’s is in groningen



Oldcar.jpeg is verandert naar oldcar

```
thijmen@thijmen-VMware-Virtual-Platform:~$ file oldcar
oldcar: JPEG image data, JFIF standard 1.01, aspect ratio, density 1x1, segment
length 16, Exif Standard: [TIFF image data, big-endian, direntries=10, manufactu
rer=motorola, model=moto g(6) play, xresolution=160, yresolution=168, resolution
unit=2, software=aljeter-user 9 PPPS29.55-35-18-7 6a0d0 release-keys, datetime=2
020:11:07 15:08:57, GPS-Data], baseline, precision 8, 4160x3120, components 3
thijmen@thijmen-VMware-Virtual-Platform:~$
```

Ubuntu ziet het nogsteeds als jpeg

Assignment 5.8: Steganography

Relevant screenshots + motivation

```
thijmen@thijmen-VMware-Virtual-Platform:~$ steghide extract -sf apple.jpg
Enter passphrase:
steghide: could not open the file "apple.jpg".
thijmen@thijmen-VMware-Virtual-Platform:~$
```

Steghide installeren en de file downloaden lukte beide maar het lukte mij niet om steghide de file te laten openen

Assignment 5.9: Capture disk images

Make relevant screenshots + motivation:

- Proof that the Debian 13 server stored a back-up image of the Ubuntu 24.04 Desktop VM.
- Proof that you can restore the back-up image into an empty VM.

```
root@thijmen-VMware-Virtual-Platform:/home/thijmen# ssh thijmen@192.168.139.11
thijmen@192.168.139.11's password:
Permission denied, please try again.
thijmen@192.168.139.11's password:
```

Het lukte mij niet om 5.9 te maken, ik mocht geen ssh verbinding maken van ubuntu naar debian. Ik heb meerdere dingen geprobeerd om het probleem te fixen maar niks werkte.

Ready? Save this file and export it as a pdf file with the name: **week5.pdf**