Template Week 5 – Operating Systems

Student number: 589671

Assignment 5.1: Unix-like

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

Het verschil Is dat UNIX en UNIX-like operating systems hetzelfde zijn en dezeflde dingen kunnen maar alleen UNIX-like mogen geen UNIX worden genoemd want ze hebben geen licentiee

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.

Kenn thompson: een van de Developer van Unix

Dennis Ritchie: was ook een van UNIX, ook heeft hij de taal programmeertaal C gemaakt

Bill Joy: een van de belangrijkste mesen achter BSD

Richard Stallman: de Founder van GNU Project data ls doel had een operating systeem te maken dat met UNIX kon werken

c) What is the philosophy of the GNU movement?

Het belangrijkste is dat er veel vrijheid en toegankelijkheid Is voor de software. Mensen moeten de sourcecode kunnen inzien en persoonlijk kunnen aanpassen mocht dat nodig zijn.

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

Ja voor een groot gedeeldte wel, maar niet helemaal. Er worden keuzes gemaakt bijvoorbeeld voor Drivers of Firmware die zorgen voor meer stabilieteit waar de vrijheid misschien iets onder lijd.

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

Dit is een systeem direct in windows gebouwd waarin de gebruiker linux kan runnen zonder een virtuele Machine nodig te hebben

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

Android: Linux, Unix like
IOS: BSD/ UNIX
ChromeOS: Linux, Unix like

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

Supercomputers worden gebruikt vaak bij werk en banen waar er heel veel data verwerkt moet worden in hele korte tijd. Zoveel data dat een normale computer de data niet aan kan. Denk aan gebruik bij Ruimtevaart, Wetenschappelijk onderzoek en weerberekenen

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 playstation3 Cluster was een Supercomputer waar Linux op runde. Het bestond uit meerdere playstation3's. dit kon omdat de playstation 3 een Cell Broad Engine gebruikte. Deze waren erg snel met data. Het werkt vooral gebruikt voor wetenschappelijk onderzoek.

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, de traagste doet al 1.87 petaFLOPS (10^{15}) berekening per seconden. Daar komt de Rasberry PI supercomputer niet eens in de buurt

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?

Playstation runt een eigen operating system die gebaseerd is op FreeBSD, dus UNIX-Like

XBOX heeft ook een eigen operating system dat gebasseerd is op windows.

Consoles zijn eigenlijk gespecialiseerde computer. Met een streng operating systeem gemaakt zodat je er alleen op kunt gamen.

Assignment 5.3: Working with Windows

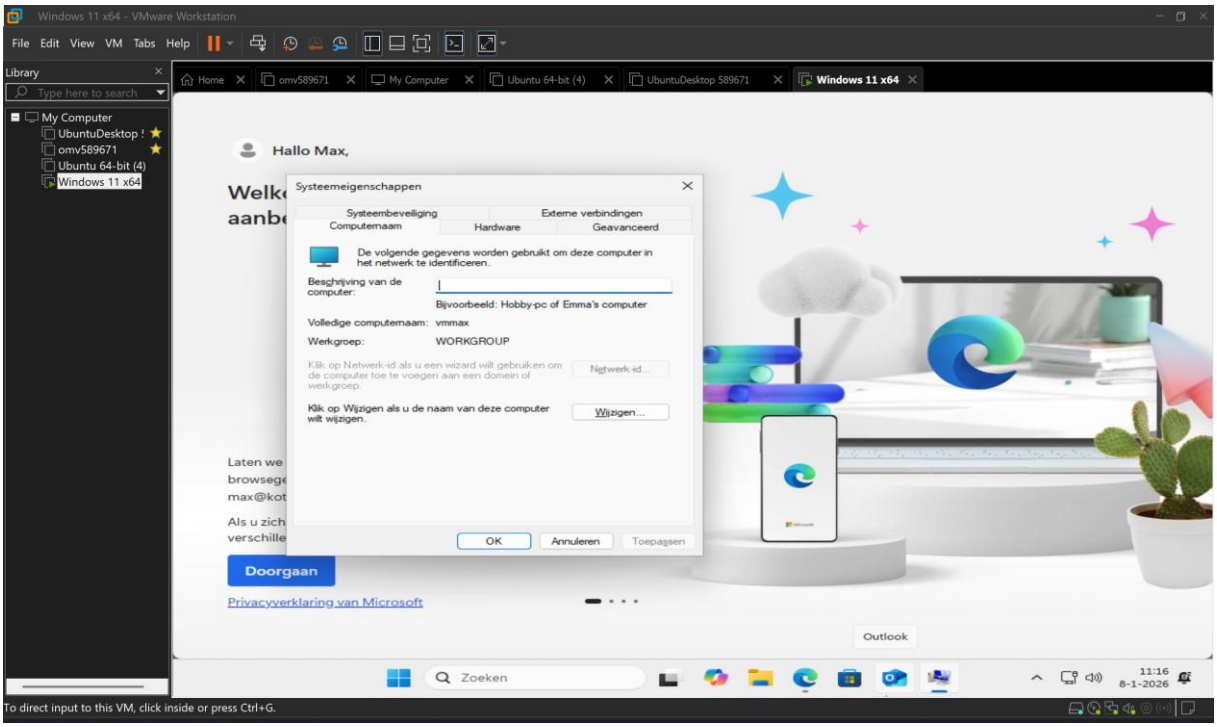
Take relevant screenshots of the assignments below

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.

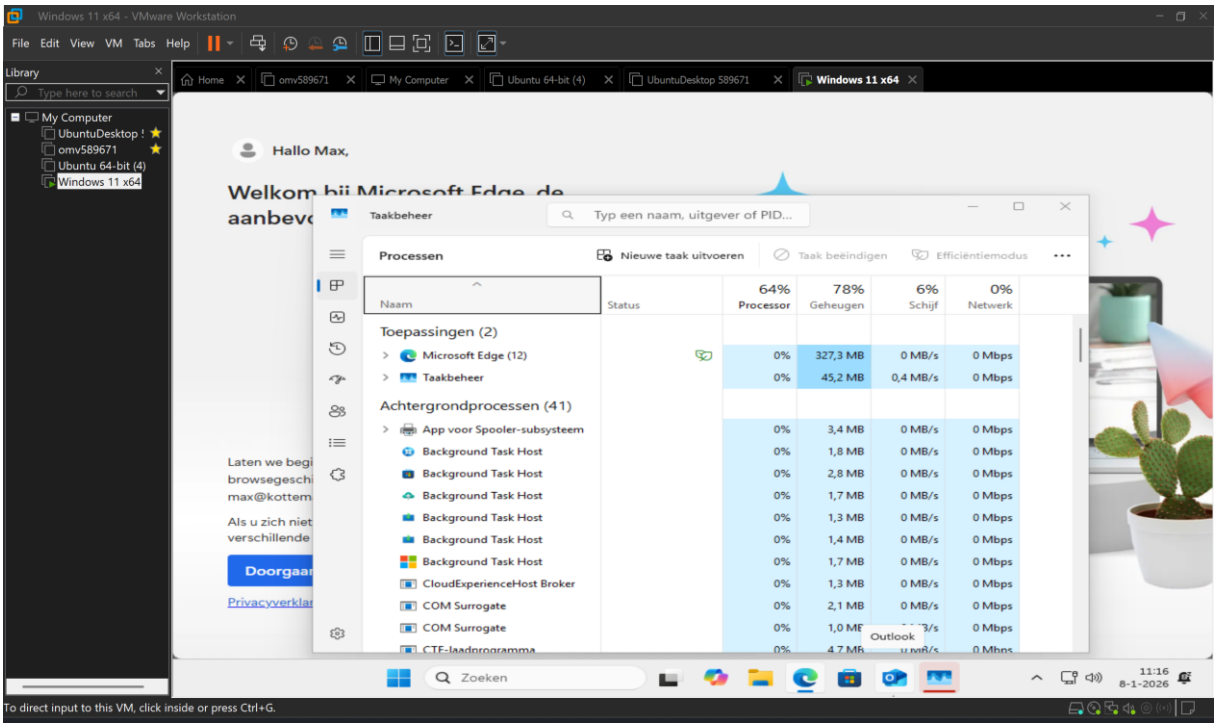
b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?

Windows knop + r +"Explorer"

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.



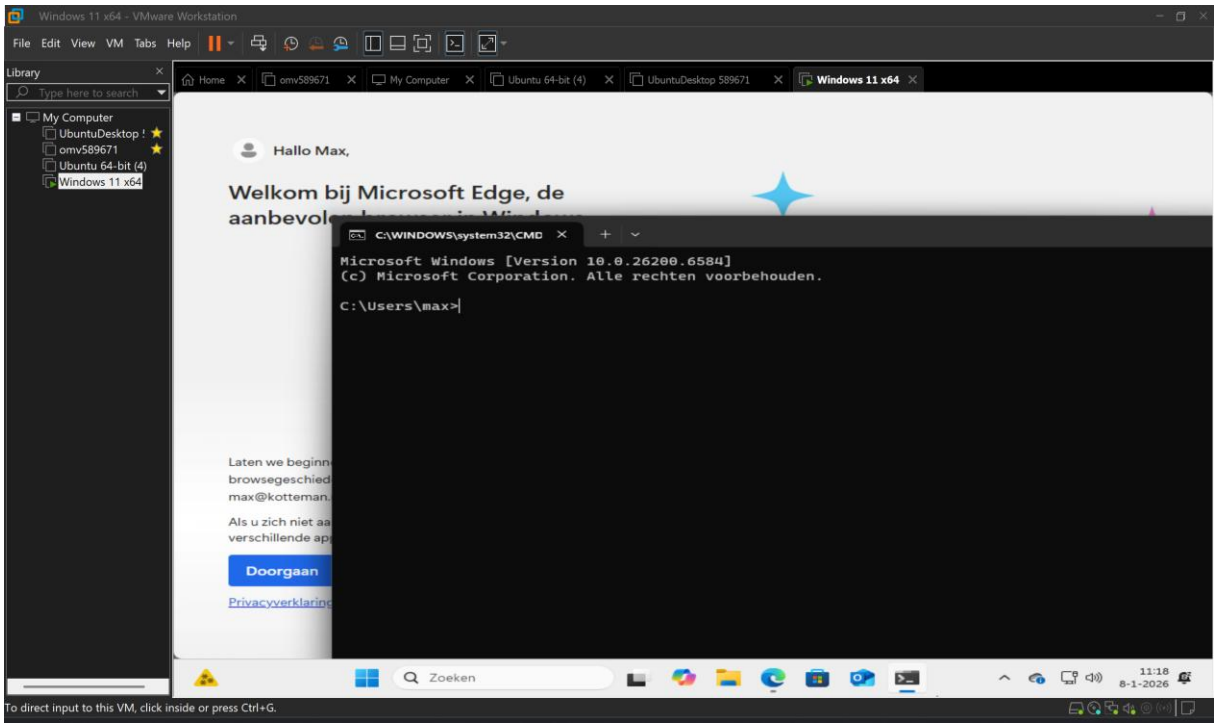
e) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector,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

Windows knop + p

f) 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?

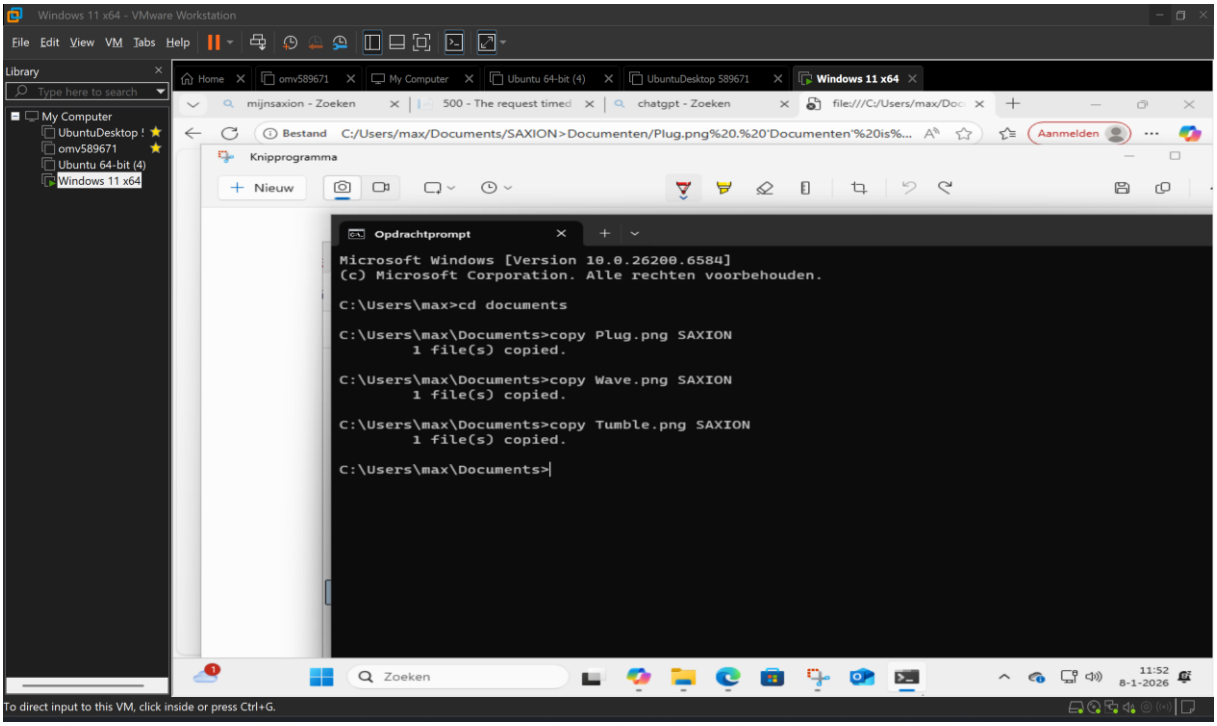
Windows knop + L

g) 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.

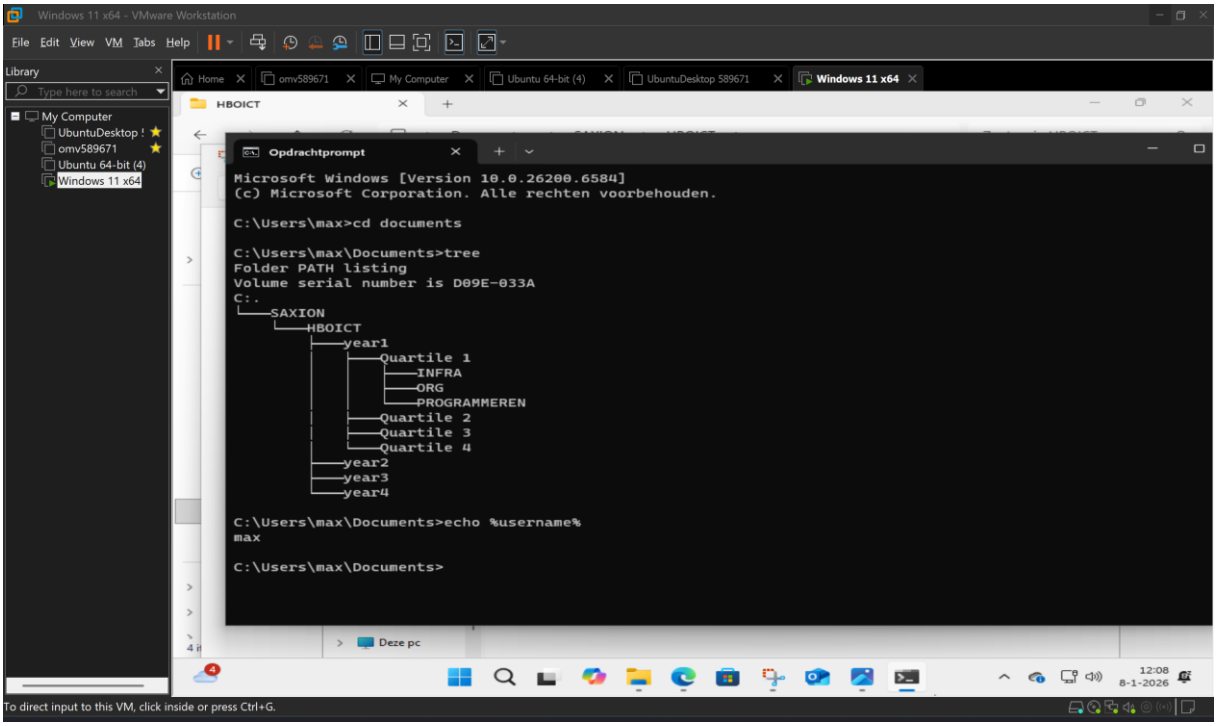


Working in the File Explorer

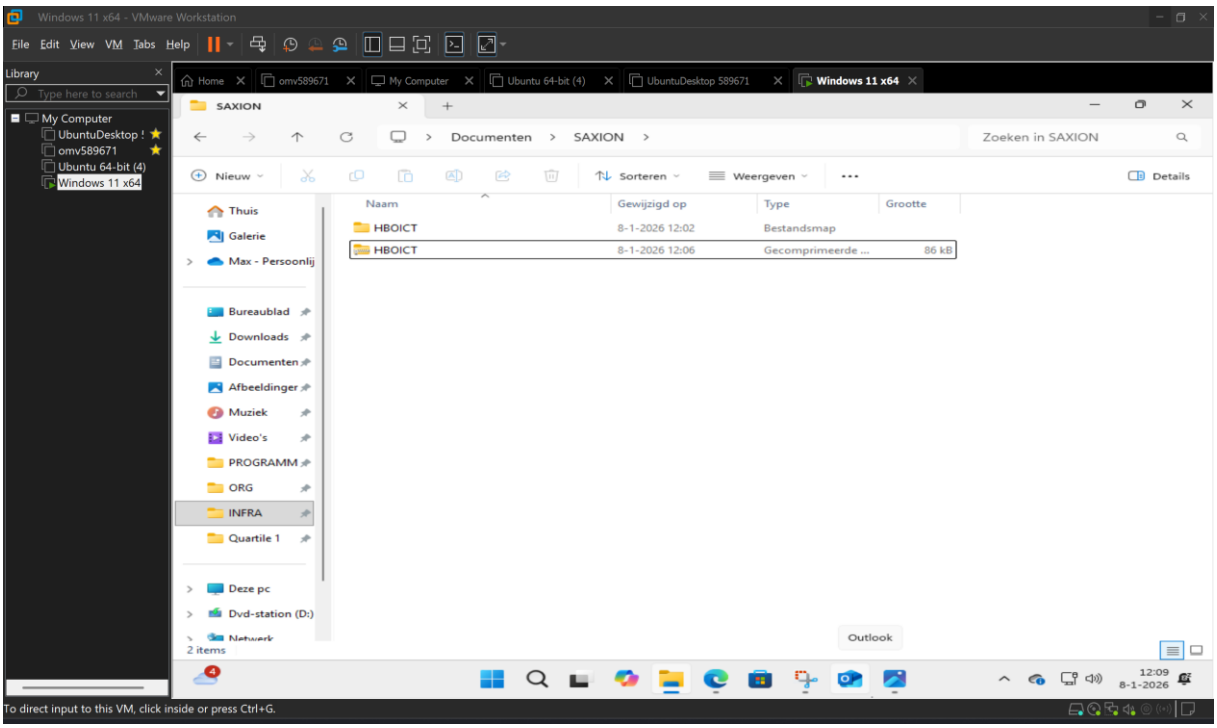
Relevant screenshots **copy** command:



Relevant screenshots **tree** command:

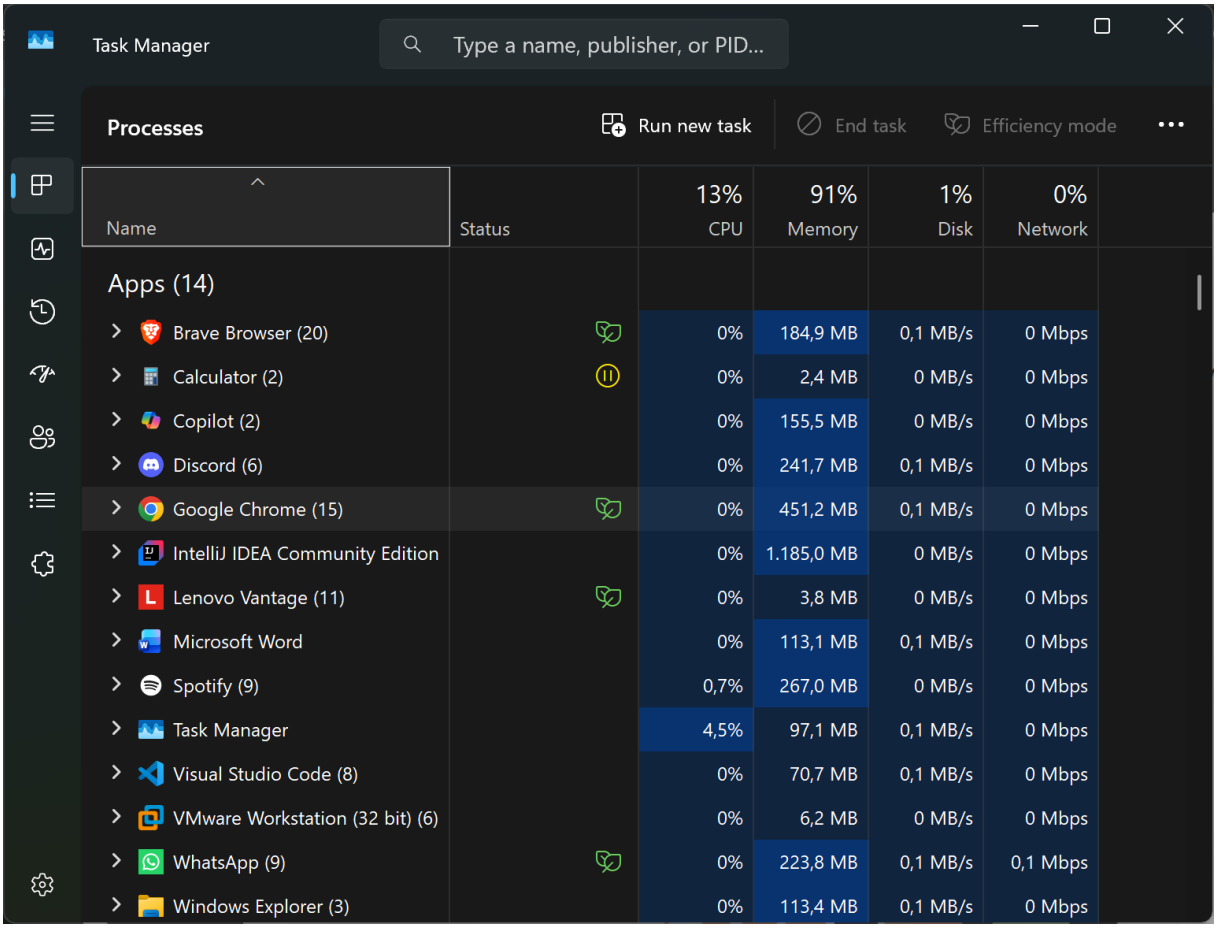


Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



Terminating Processes

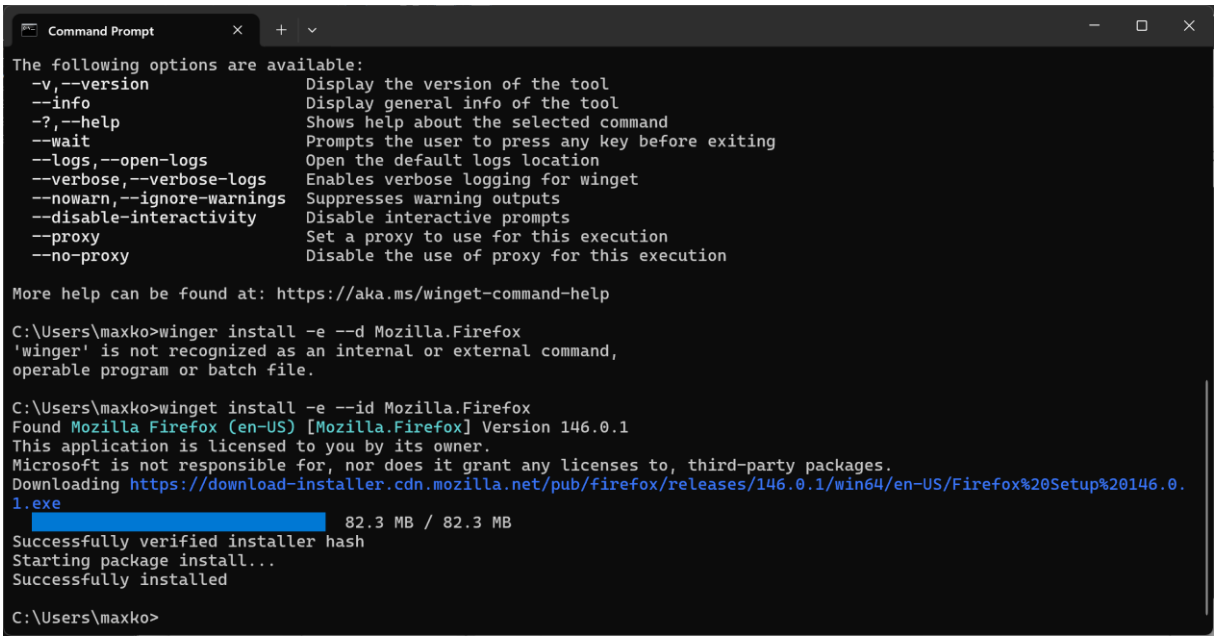
Relevant Screenshots Task Manager Window:

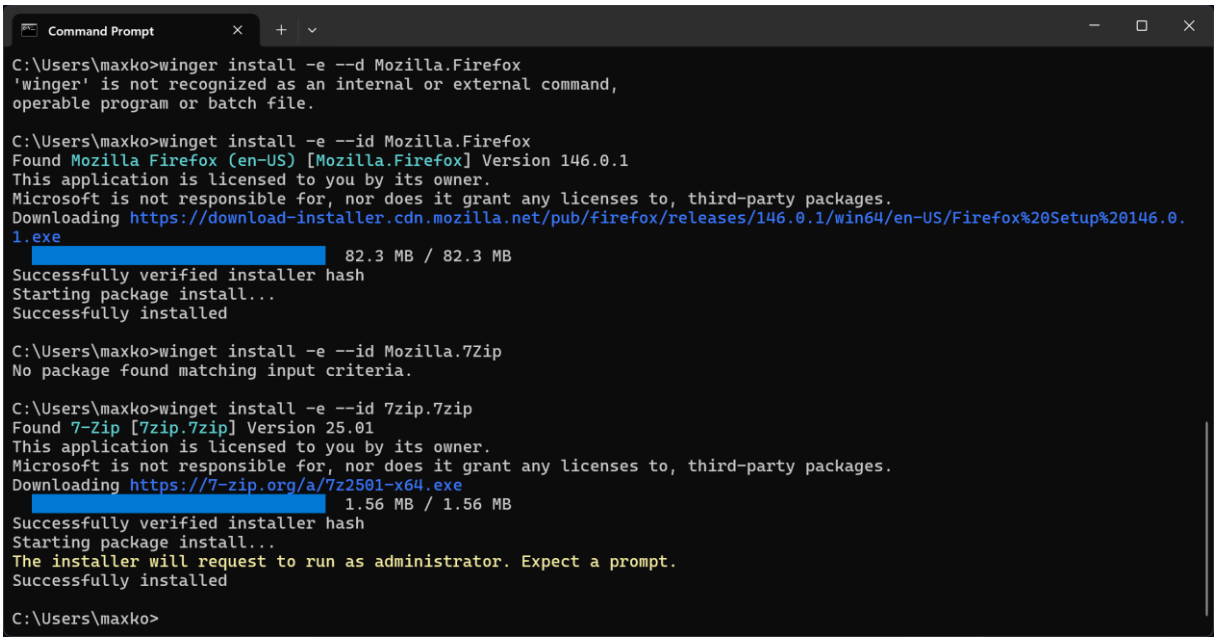


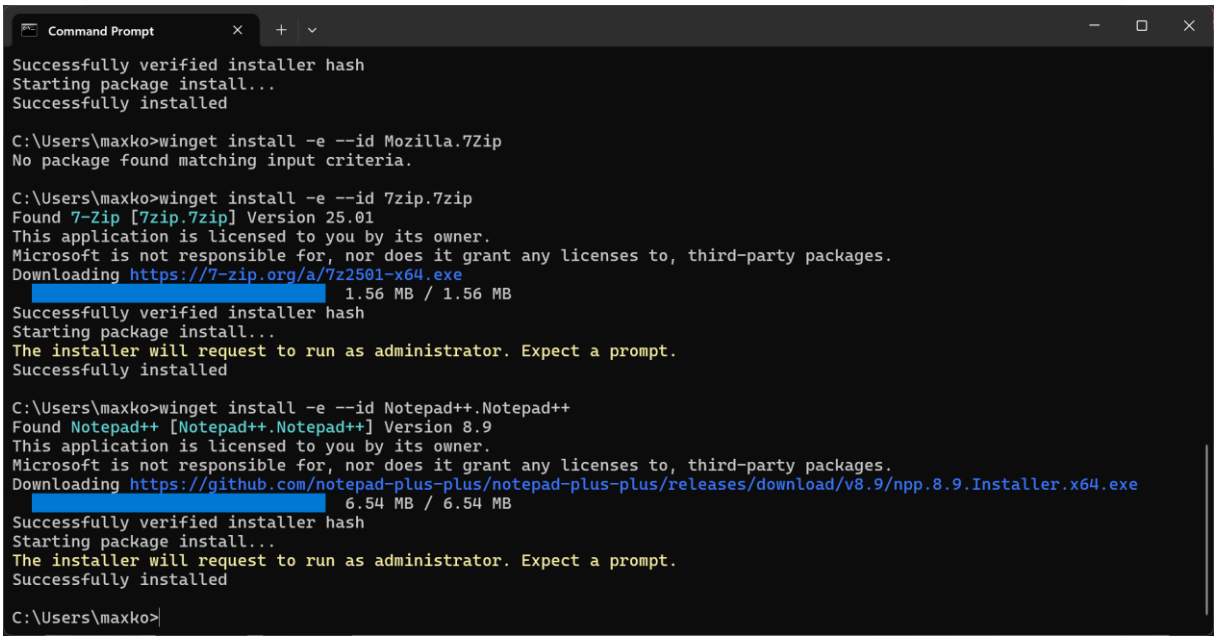
Install Software

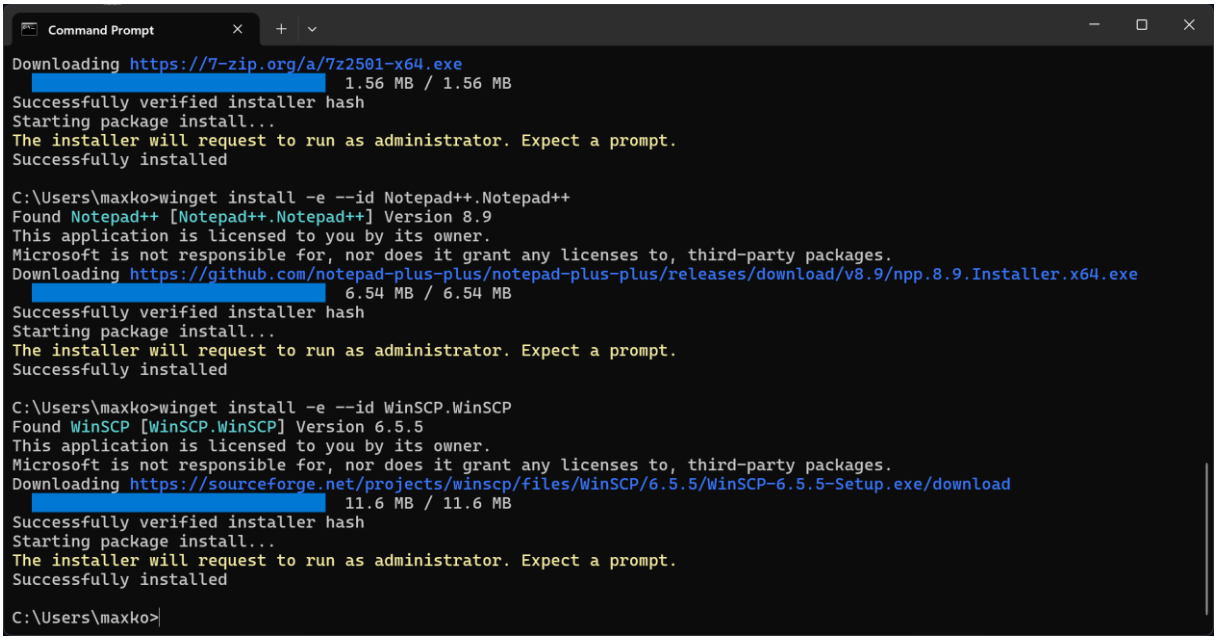
Relevant screenshots that the following software is installed with winget:

- WinSCP
- Notepad++
- 7zip


Command Prompt
The following options are available:
-v,--version Display the version of the tool
--info Display general info of the tool
-?,--help Shows help about the selected command
--wait Prompts the user to press any key before exiting
--logs,--open-logs Open the default logs location
--verbose,--verbose-logs Enables verbose logging for winget
--nowarn,--ignore-warnings Suppresses warning outputs
--disable-interactivity Disable interactive prompts
--proxy Set a proxy to use for this execution
--no-proxy Disable the use of proxy for this execution
More help can be found at: https://aka.ms/winget-command-help
C:\Users\maxko>winger install -e --d Mozilla.Firefox
'winger' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\maxko>winget install -e --id Mozilla.Firefox
Found Mozilla Firefox (en-US) [Mozilla.Firefox] Version 146.0.1
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Downloading https://download-installer.cdn.mozilla.net/pub/firefox/releases/146.0.1/win64/en-US/Firefox%20Setup%20146.0.1.exe
82.3 MB / 82.3 MB
Successfully verified installer hash
Starting package install...
Successfully installed
C:\Users\maxko>

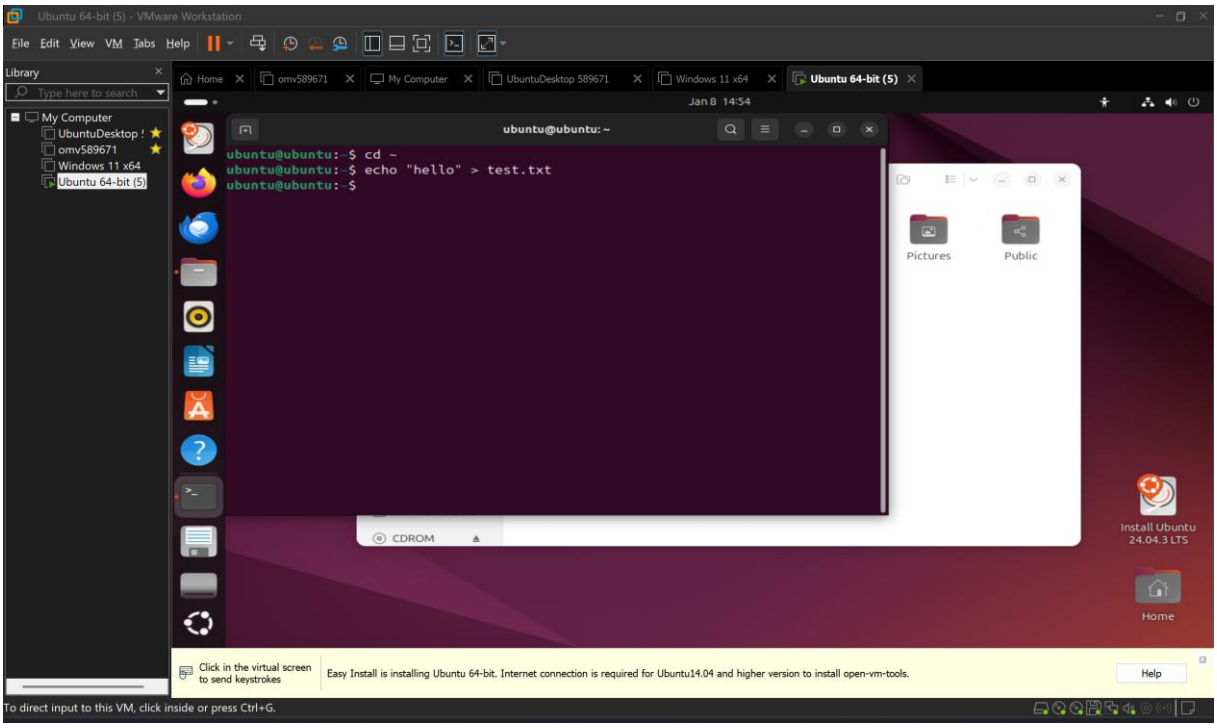

Command Prompt
C:\Users\maxko>winger install -e --d Mozilla.Firefox
'winger' is not recognized as an internal or external command,
operable program or batch file.
C:\Users\maxko>winget install -e --id Mozilla.Firefox
Found Mozilla Firefox (en-US) [Mozilla.Firefox] Version 146.0.1
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Downloading https://download-installer.cdn.mozilla.net/pub/firefox/releases/146.0.1/win64/en-US/Firefox%20Setup%20146.0.1.exe
82.3 MB / 82.3 MB
Successfully verified installer hash
Starting package install...
Successfully installed
C:\Users\maxko>winget install -e --id Mozilla.7Zip
No package found matching input criteria.
C:\Users\maxko>winget install -e --id 7zip.7zip
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.
Downloading https://7-zip.org/a/7z2501-x64.exe
1.56 MB / 1.56 MB
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator. Expect a prompt.
Successfully installed
C:\Users\maxko>

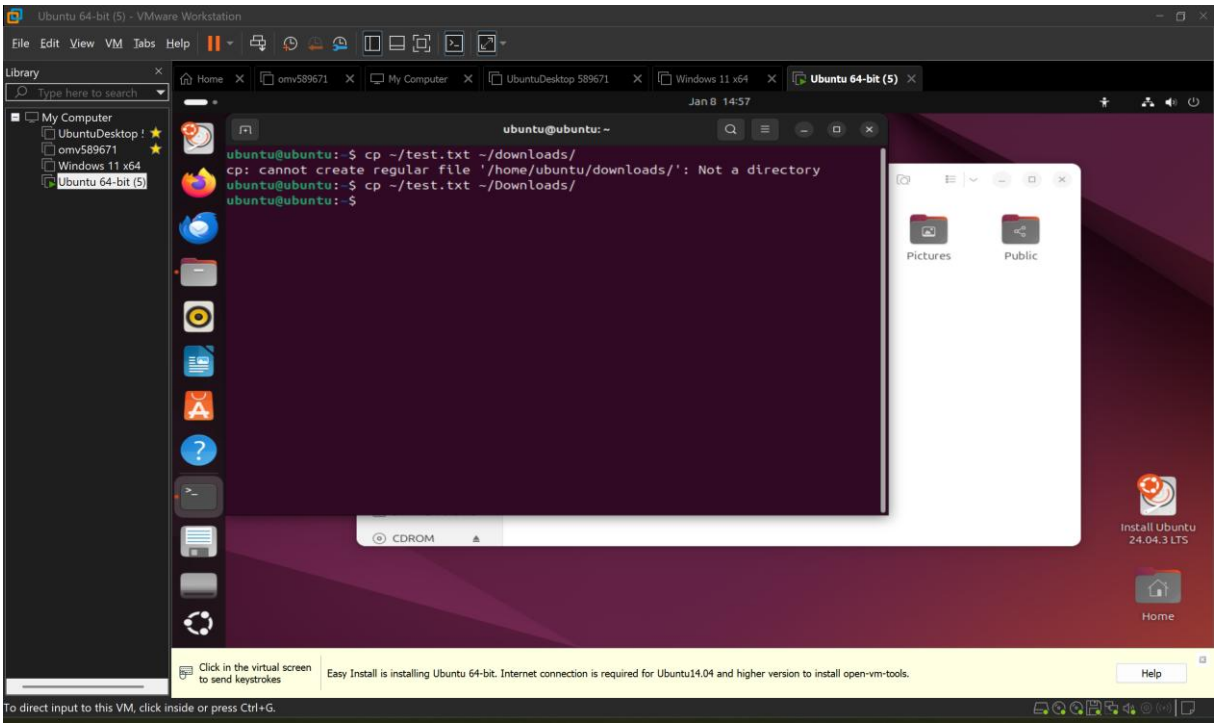


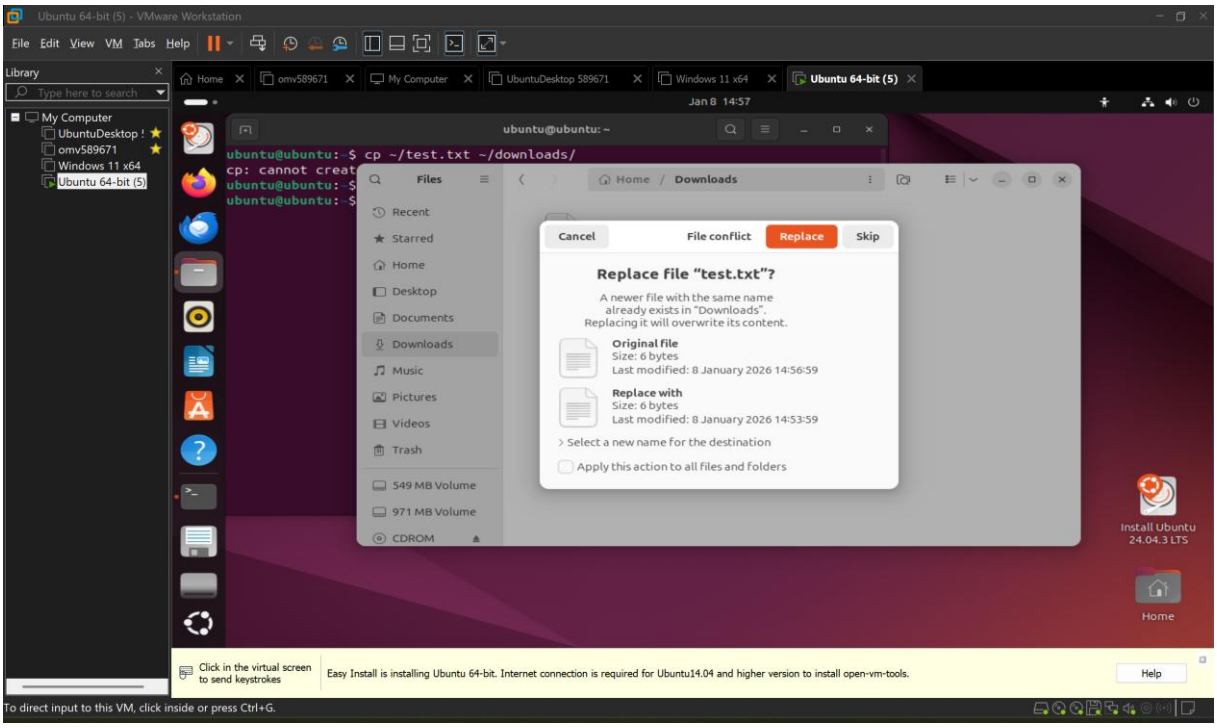


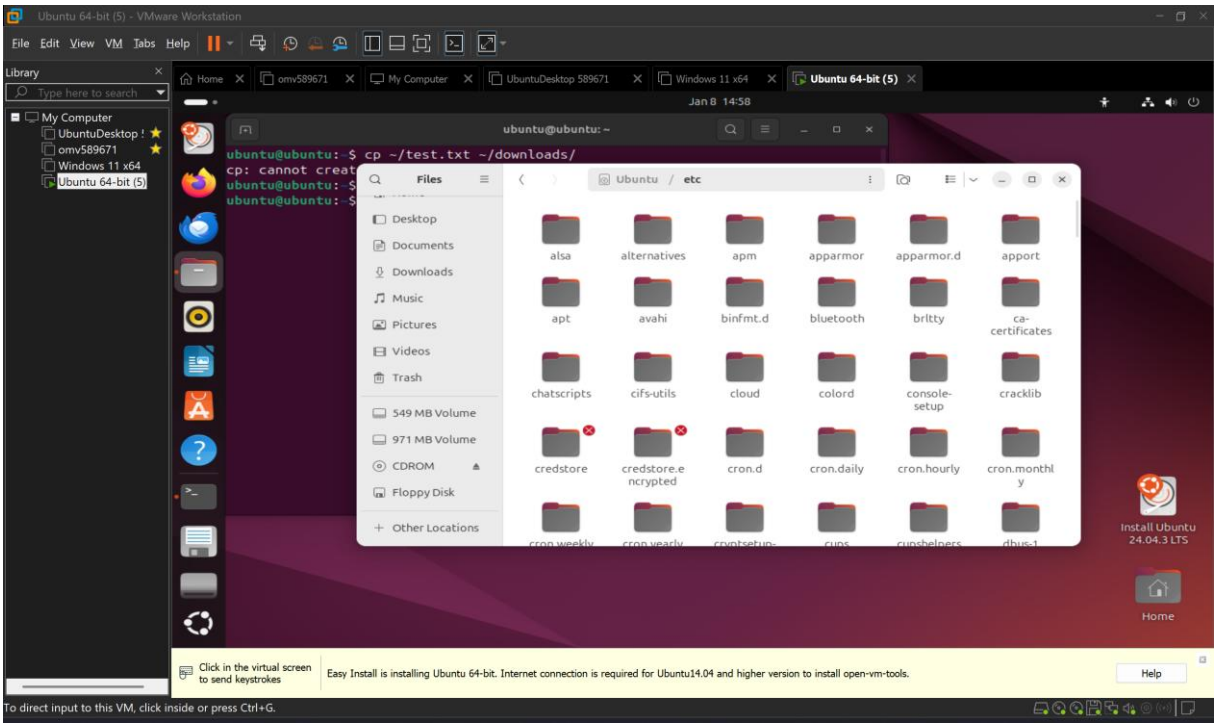
Assignment 5.4: Working with Linux

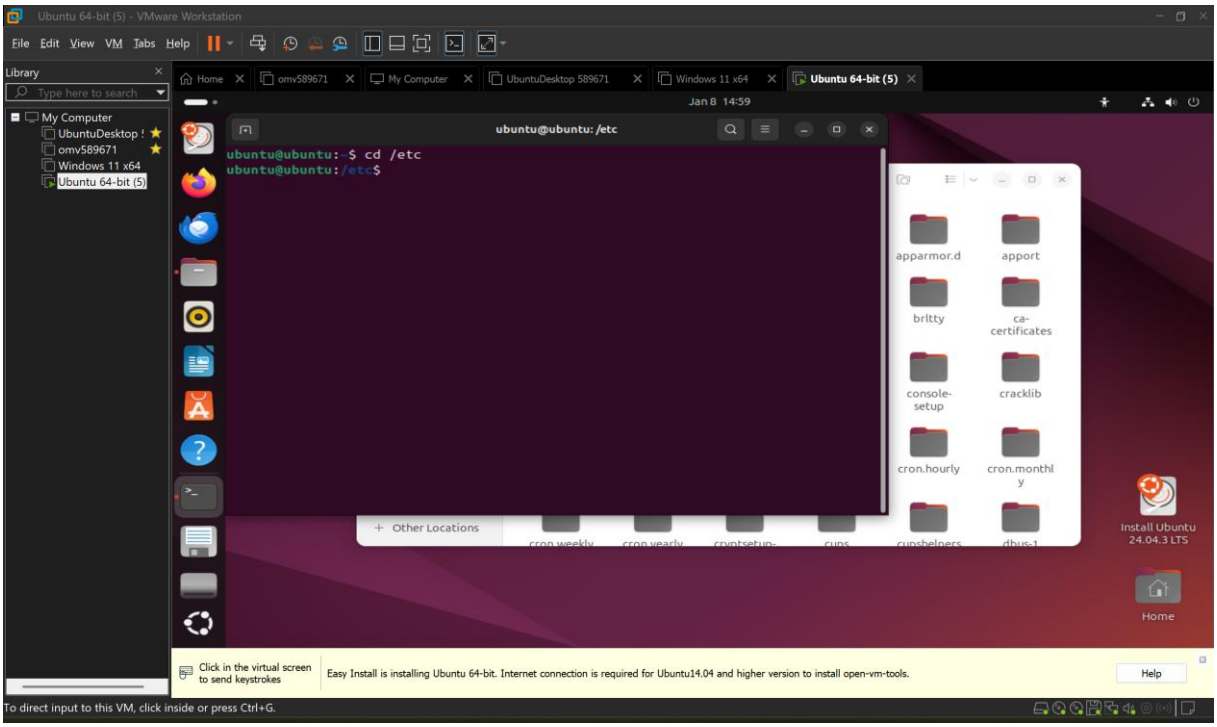
Relevant screenshots + motivation


Ubuntu 64-bit (5) - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
UbuntuDesktop !
omv589671
Windows 11 x64
Ubuntu 64-bit (5)
Home
omv589671
My Computer
UbuntuDesktop 589671
Windows 11 x64
Ubuntu 64-bit (5)
Jan 8 14:54
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ cd ~
ubuntu@ubuntu:~$ echo "hello" > test.txt
ubuntu@ubuntu:~$
Pictures
Public
CDROM
Install Ubuntu 24.04.3 LTS
Home
Click in the virtual screen to send keystrokes
Easy Install is installing Ubuntu 64-bit. Internet connection is required for Ubuntu14.04 and higher version to install open-vm-tools.
Help
To direct input to this VM, click inside or press Ctrl+G.


Ubuntu 64-bit (5) - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
UbuntuDesktop !
omv589671
Windows 11 x64
Ubuntu 64-bit (5)
Home
omv589671
My Computer
UbuntuDesktop 589671
Windows 11 x64
Ubuntu 64-bit (5)
Jan 8 14:57
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ cp ~/test.txt ~/downloads/
cp: cannot create regular file '/home/ubuntu/downloads/': Not a directory
ubuntu@ubuntu:~$ cp ~/test.txt ~/Downloads/
ubuntu@ubuntu:~$
Pictures
Public
CDROM
Install Ubuntu 24.04.3 LTS
Home
Click in the virtual screen to send keystrokes
Easy Install is installing Ubuntu 64-bit. Internet connection is required for Ubuntu14.04 and higher version to install open-vm-tools.
Help
To direct input to this VM, click inside or press Ctrl+G.


Ubuntu 64-bit (5) - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
UbuntuDesktop !
omv589671
Windows 11 x64
Ubuntu 64-bit (5)
Home
omv589671
My Computer
UbuntuDesktop 589671
Windows 11 x64
Ubuntu 64-bit (5)
Jan 8 14:57
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ cp ~/test.txt ~/downloads/
cp: cannot creat
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$
Files
Recent
Starred
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
549 MB Volume
971 MB Volume
CDROM
Home / Downloads
Cancel
File conflict
Replace
Skip
Replace file "test.txt"?
A newer file with the same name already exists in "Downloads".
Replacing it will overwrite its content.
Original File
Size: 6 bytes
Last modified: 8 January 2026 14:56:59
Replace with
Size: 6 bytes
Last modified: 8 January 2026 14:53:59
Select a new name for the destination
Apply this action to all files and folders
Install Ubuntu 24.04.3 LTS
Home
Click in the virtual screen to send keystrokes
Easy Install is installing Ubuntu 64-bit. Internet connection is required for Ubuntu14.04 and higher version to install open-vm-tools.
Help
To direct input to this VM, click inside or press Ctrl+G.


Ubuntu 64-bit (5) - VMware Workstation
File Edit View VM Tabs Help
Library
Type here to search
My Computer
UbuntuDesktop !
omv589671
Windows 11 x64
Ubuntu 64-bit (5)
Home
omv589671
My Computer
UbuntuDesktop 589671
Windows 11 x64
Ubuntu 64-bit (5)
Jan 8 14:58
ubuntu@ubuntu: ~
ubuntu@ubuntu:~$ cp ~/test.txt ~/downloads/
cp: cannot creat
ubuntu@ubuntu:~$
ubuntu@ubuntu:~$
Files
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
549 MB Volume
971 MB Volume
CDROM
Floppy Disk
Other Locations
Ubuntu / etc
alsa
alternatives
apm
apparmor
apparmor.d
apport
apt
avahi
binfmt.d
bluetooth
brltty
ca-certificates
chatscripts
cifs-utils
cloud
colord
console-setup
cracklib
credstore
credstore.encrypted
cron.d
cron.daily
cron.hourly
cron.monthly
cron.weekly
cron.yearly
cryptsetup-
cups
cupshelpers
dbus-1
Install Ubuntu 24.04.3 LTS
Home
Click in the virtual screen to send keystrokes
Easy Install is installing Ubuntu 64-bit. Internet connection is required for Ubuntu14.04 and higher version to install open-vm-tools.
Help
To direct input to this VM, click inside or press Ctrl+G.



Om terug naar home to gaan cd ~ of cd

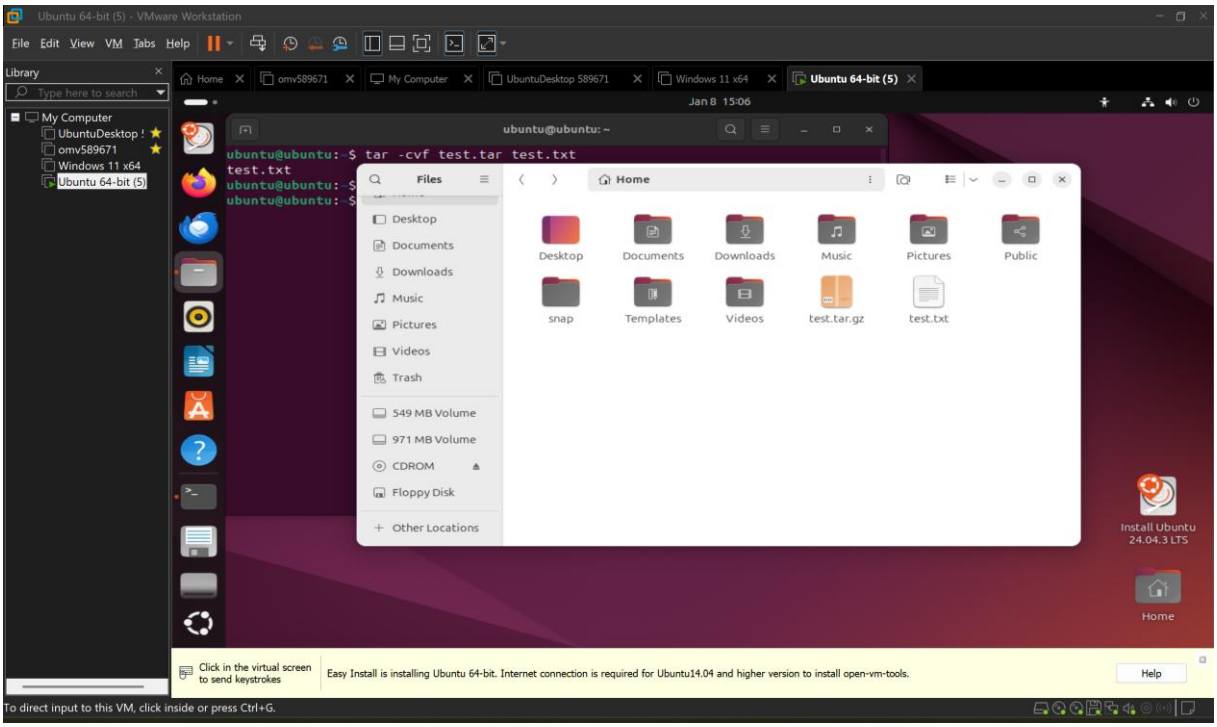
Linux heeft 1 main Directory /

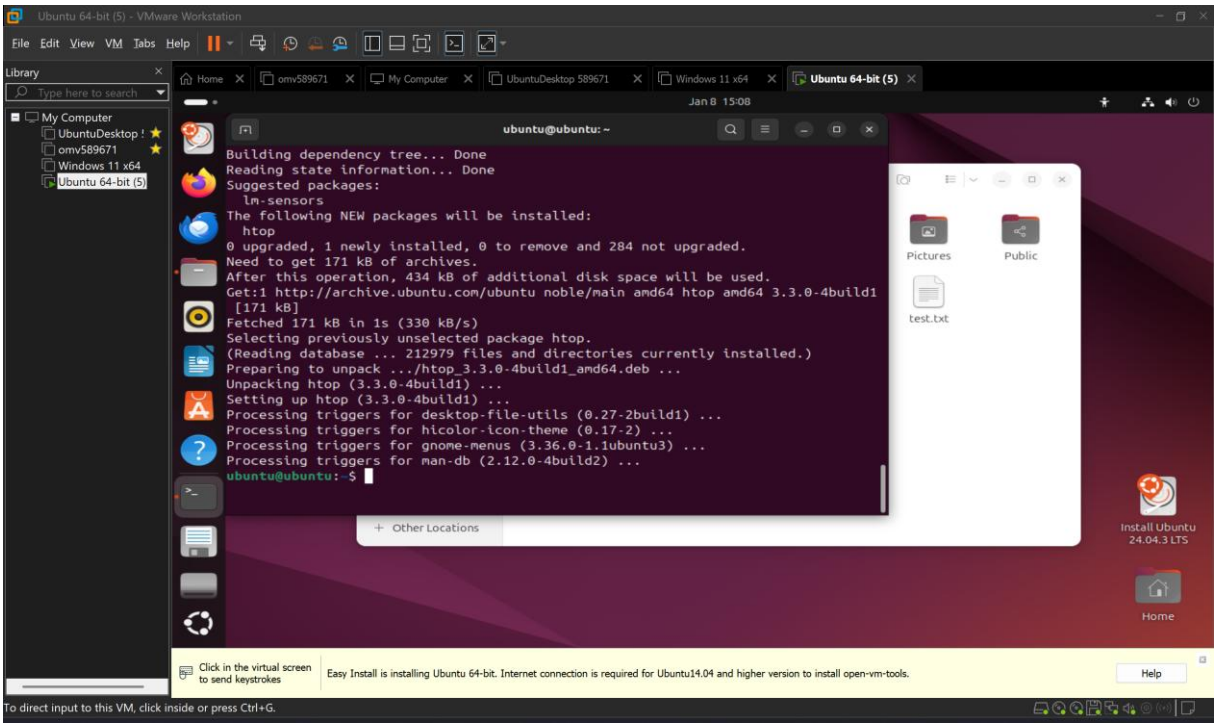
Windows kan er meerdere hebben C; D; etc,

Etc is voor bestanden van het hele systeem, bijvoorbeeld network instelligen

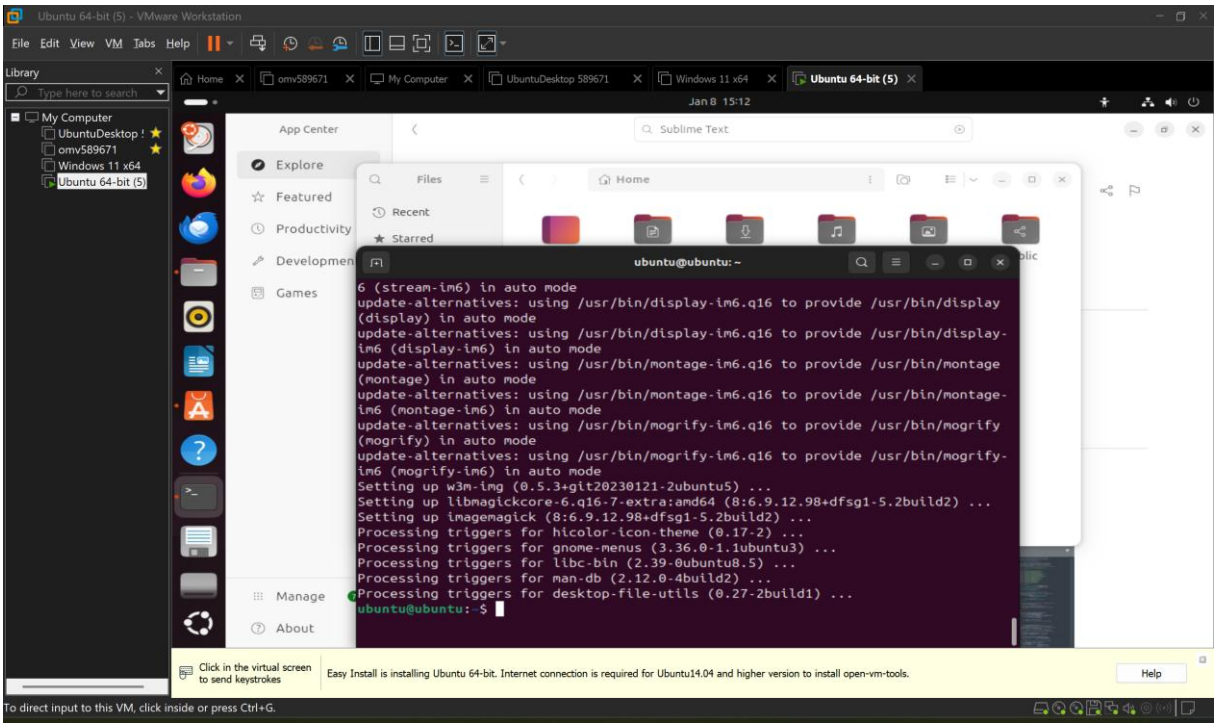
tar -cvf archive.tar myfile.txt

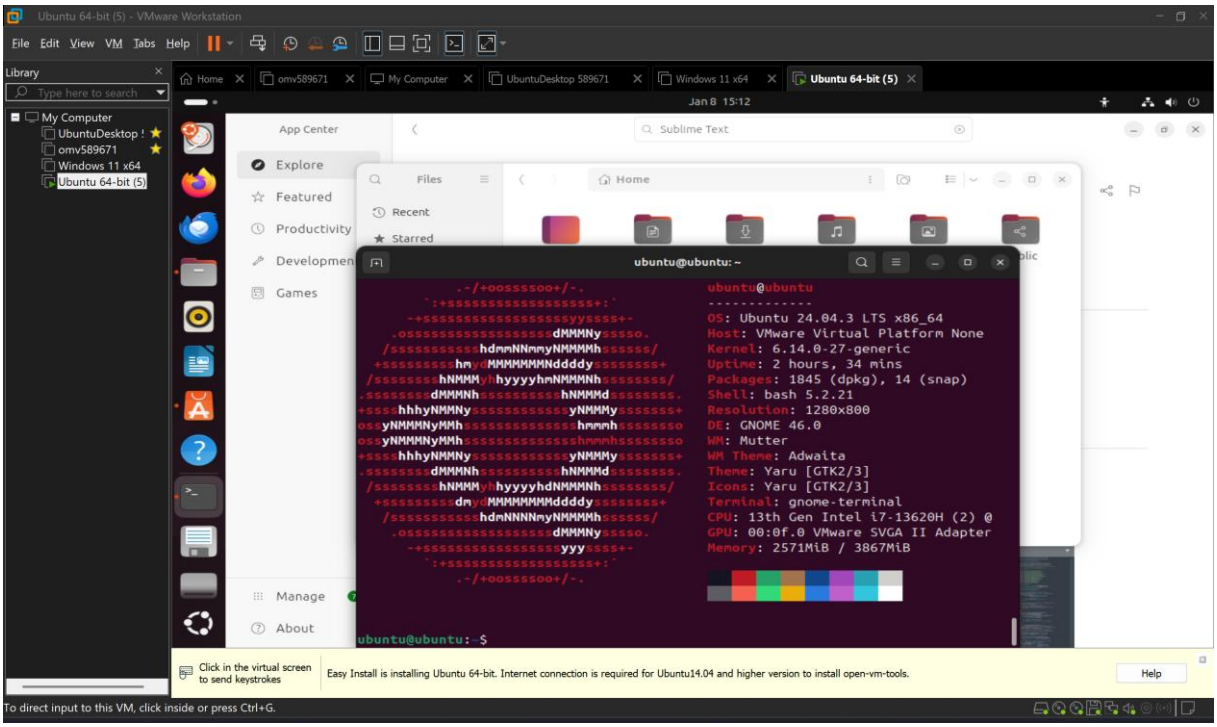
tar -xvf archive.tar





Htop is een systeem monitor. Je kan er de performance van de pc inzien

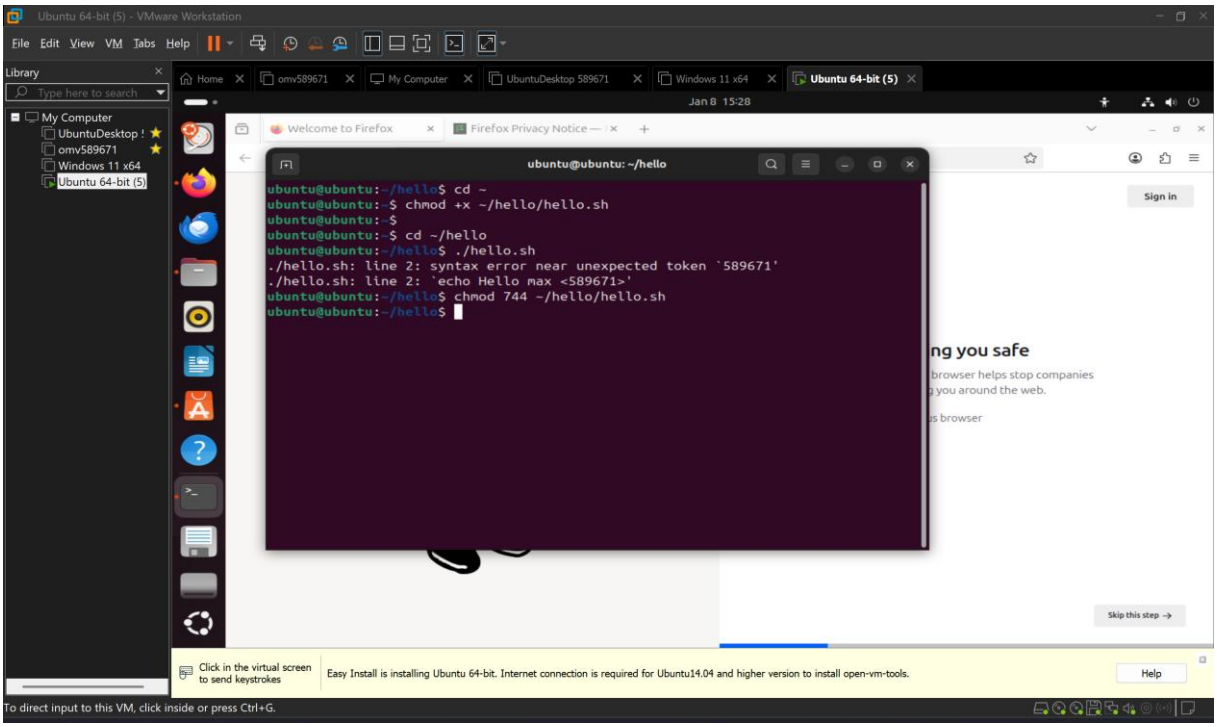




Het laat informatie over je computer/ systeem zien

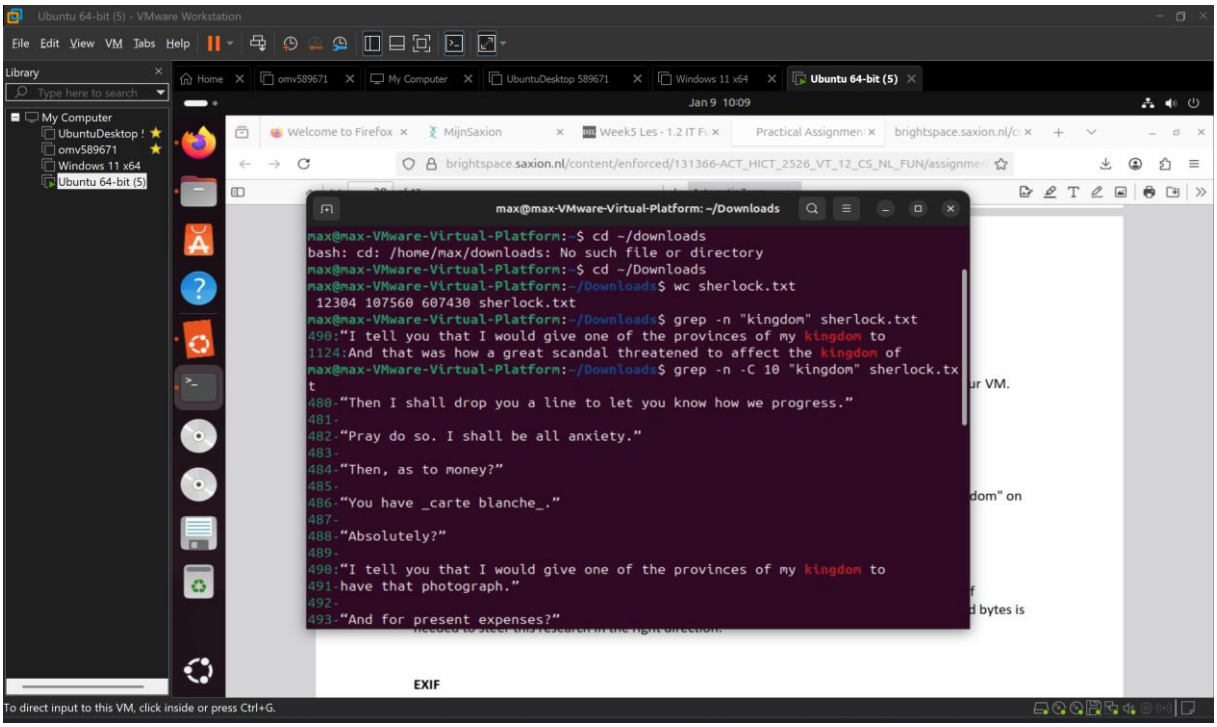
Assignment 5.5: Users and permissions on Linux

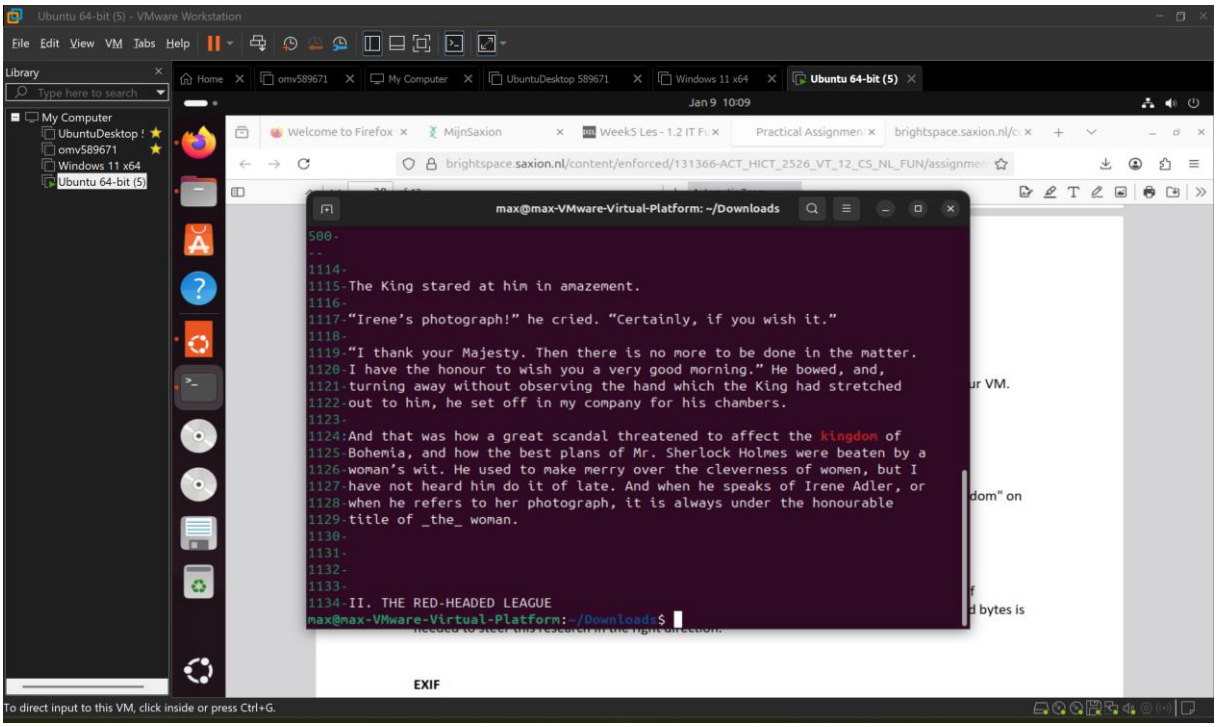
Relevant screenshots + motivation



Assignment 5.6: View the contents of files

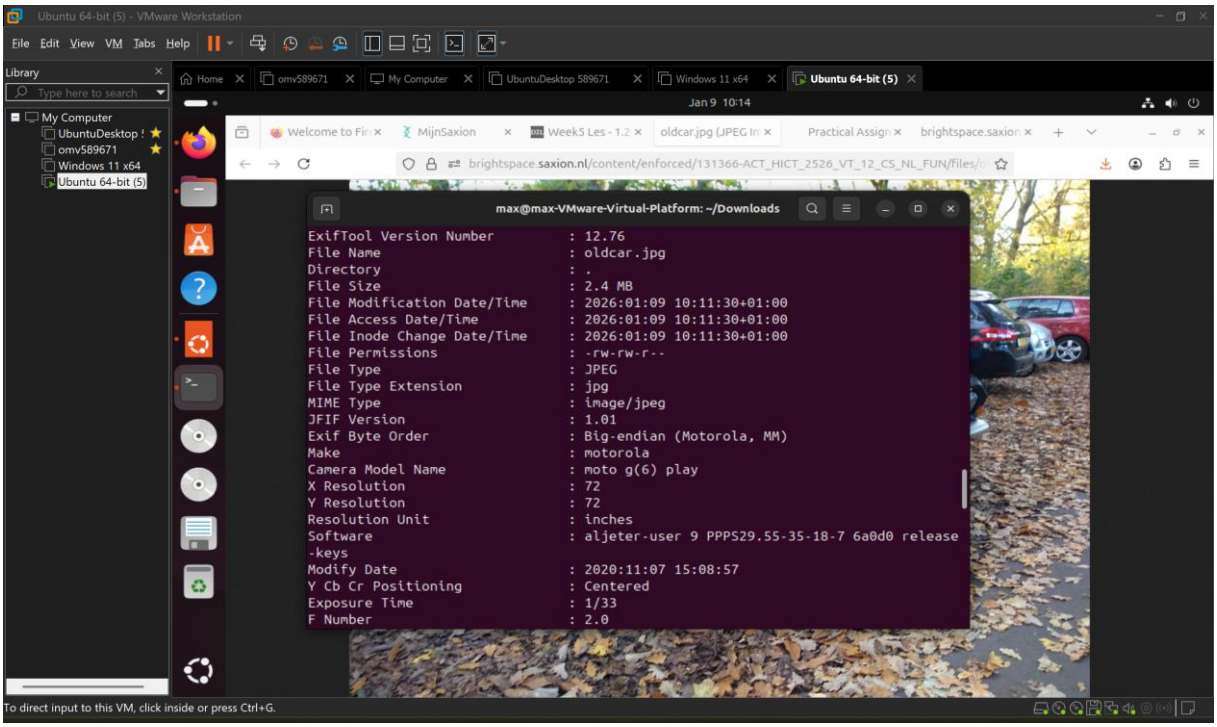
Relevant screenshots + motivation

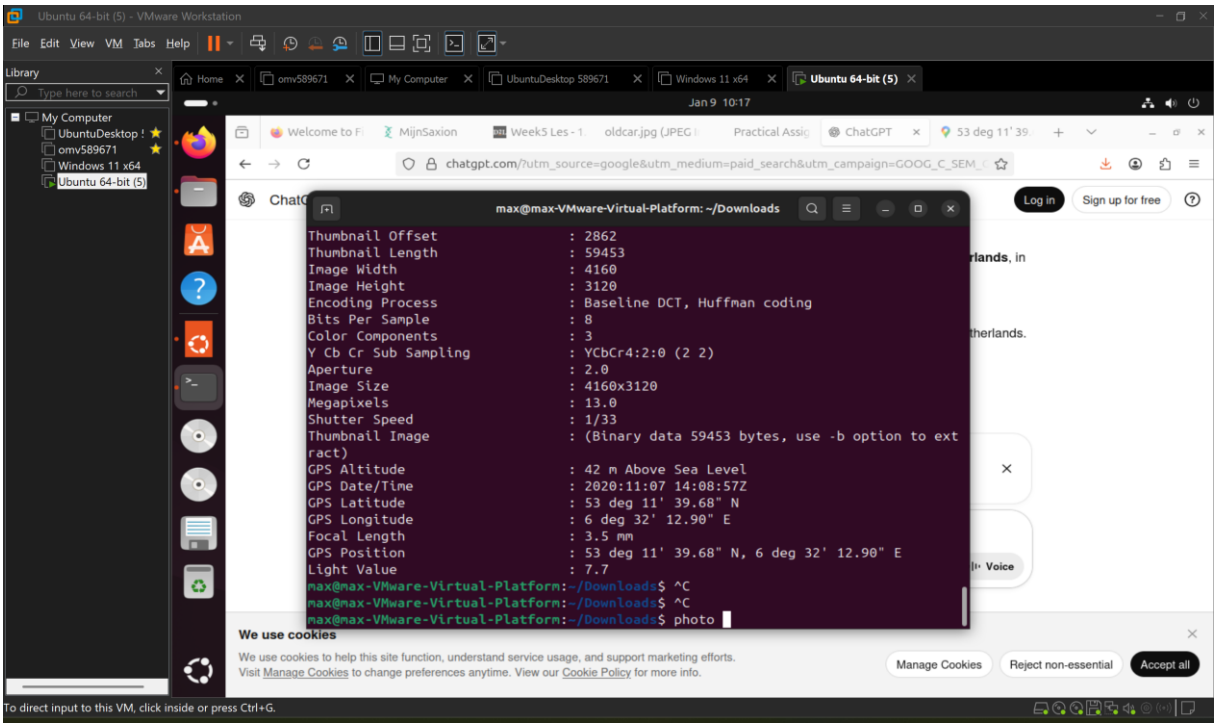




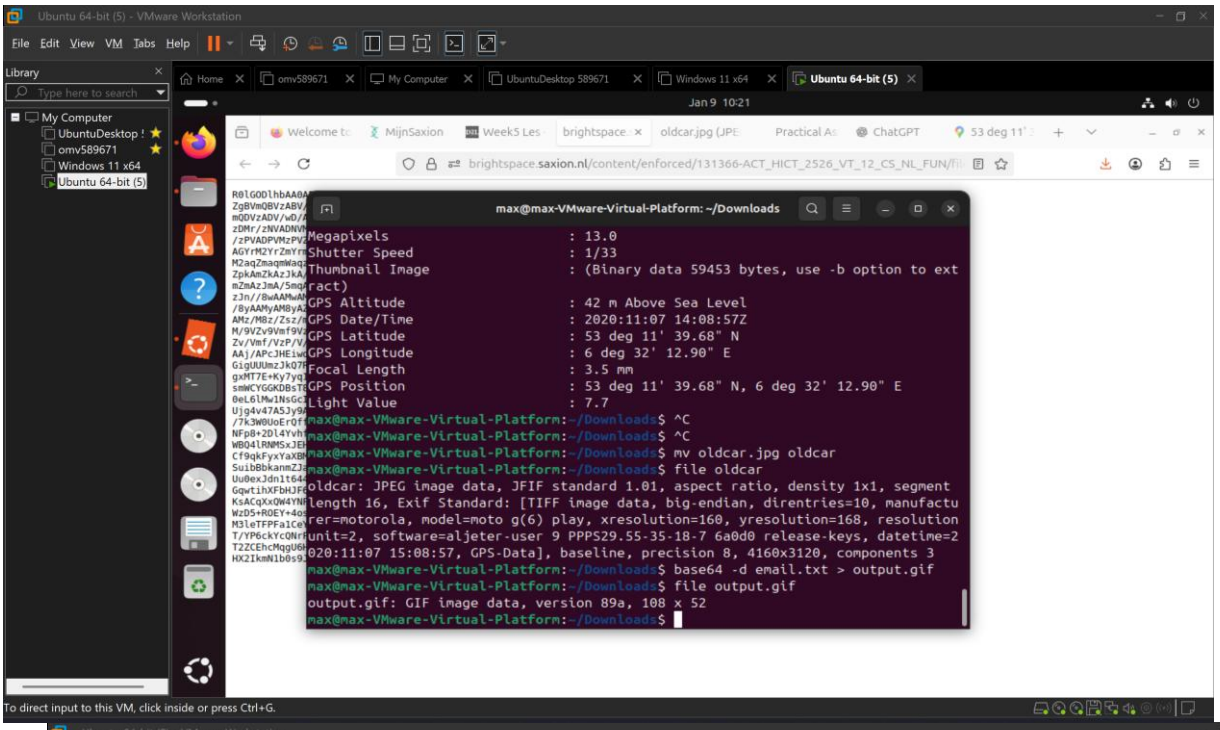
Assignment 5.7: Digital forensics

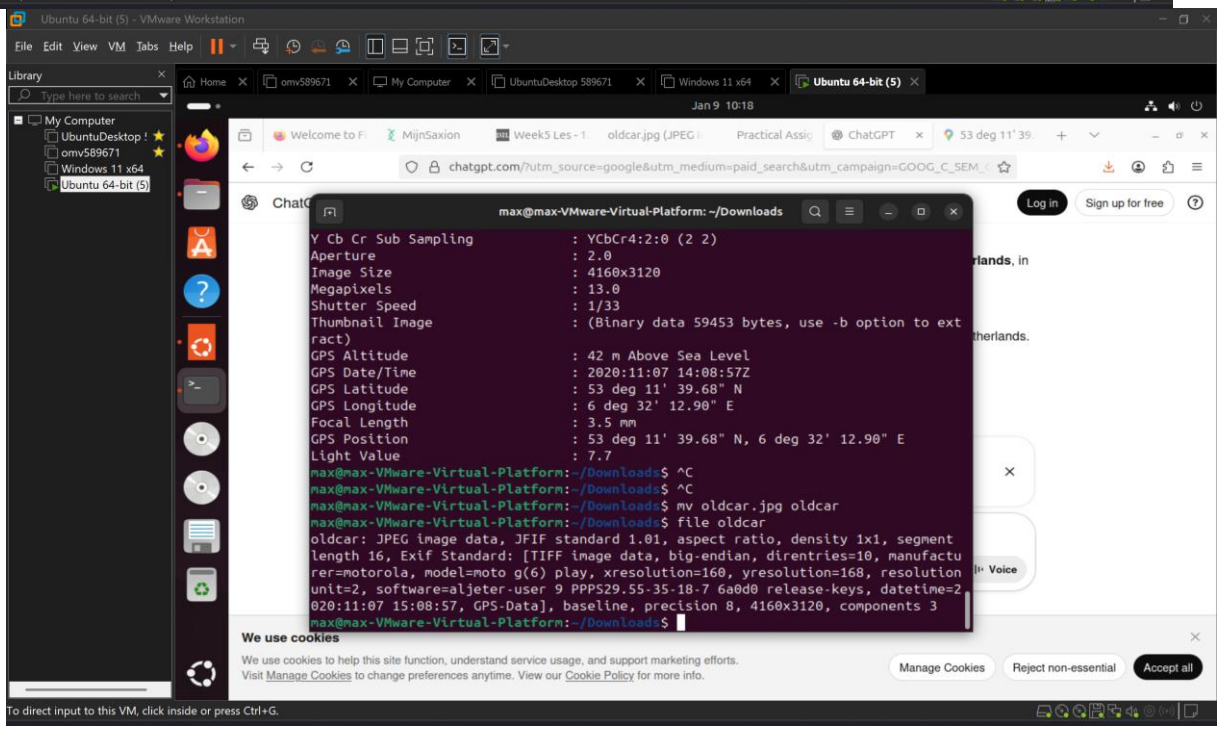
Relevant screenshots + motivation





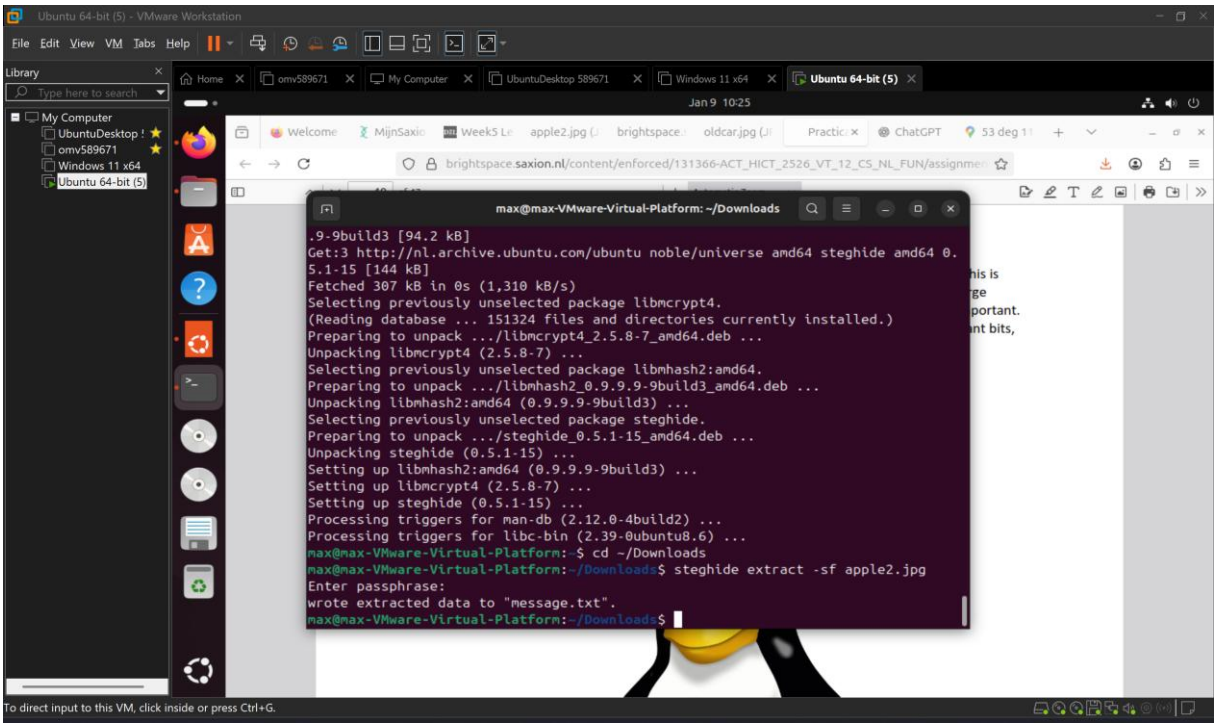
De foto is genomen in Groningen





Assignment 5.8: Steganography

Relevant screenshots + motivation



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.

/////

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