Template Week 5 – Operating Systems

Student number: 589845

Assignment 5.1: Unix-like

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

Certification:
UNIX is certified; Unix-like is not.

Trademark:
UNIX is a brand; "Unix-like" is a descriptive term.

Source/License:
UNIX often proprietary; Unix-like often open-source (Linux).

Origin:
UNIX traces to Bell Labs; Unix-like (e.g., Linux) are inspired creations

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.

They are the founders of the UNIX and unix-like systems (and/or branches).
Besides that, they implemented other big things that are still used to this day (Like git, Linux and language B and C and more.

c) What is the philosophy of the GNU movement?
To give freedom to the users, to do things like: run, study, redistribute and improve/modify software

d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.
Yes, You can find and download the source code and run it without a need for a license.

e) Find out what is the Windows Subsystem for Linux?
it's a system that enables users to run a linux like environment on your windows machine without needing to dual boot or run a VMware

f) Find out, which operating system family belongs to Android, iOS and ChromeOS?
   a. Android: Linux-Kernel
   b. iOS: Unix (Darwin)
   c. CromeOS: 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

Supercomputers are super powerful computers, more powerful than most consumers computers.
The supercomputers are used for: Research, Analyzing and study's, Furter development of Supercomputers, Maintenance of nuclear arsenal, Creation of global climate models, rendering 3d images and to play chess.

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?
A PlayStation 3 cluster is a distributed supercomputer built from many networked PS3s,
It is used for Scientific Research, Image and Data Analysis, AI and breaking complex encryption problems.

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/
I don't think it made it, because a raspberry pi isn't as fast and good as a normal pc. So when you link 1050 together, yes it will be way better than a normal pc, and probably also better than some supercomputers but I don't believe it will/can make to top500 supercomputers of that time.

e) What CPU architecture is used for the PlayStation 5 and Xbox Series X?
X86
What operating systems run on these consoles?
For PlayStation 5 it is: FreeBSD11.
For Xbox Series X it is: Xbox OS (It is based on Windows)
What conclusion can you draw from the answer to the previous question?
Both consoles run almost the same as a computer does.

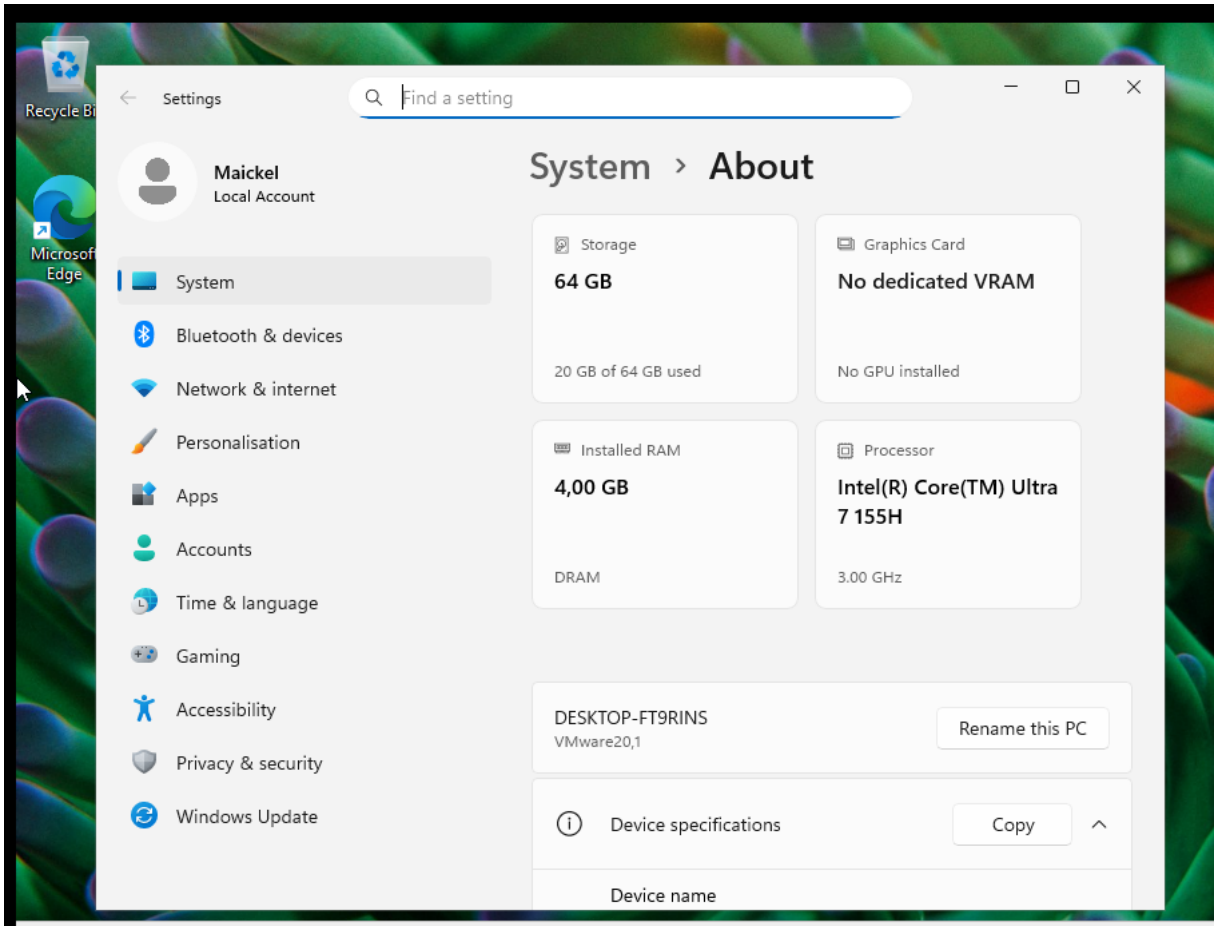
Assignment 5.3: Working with Windows

Take relevant screenshots of the assignments below

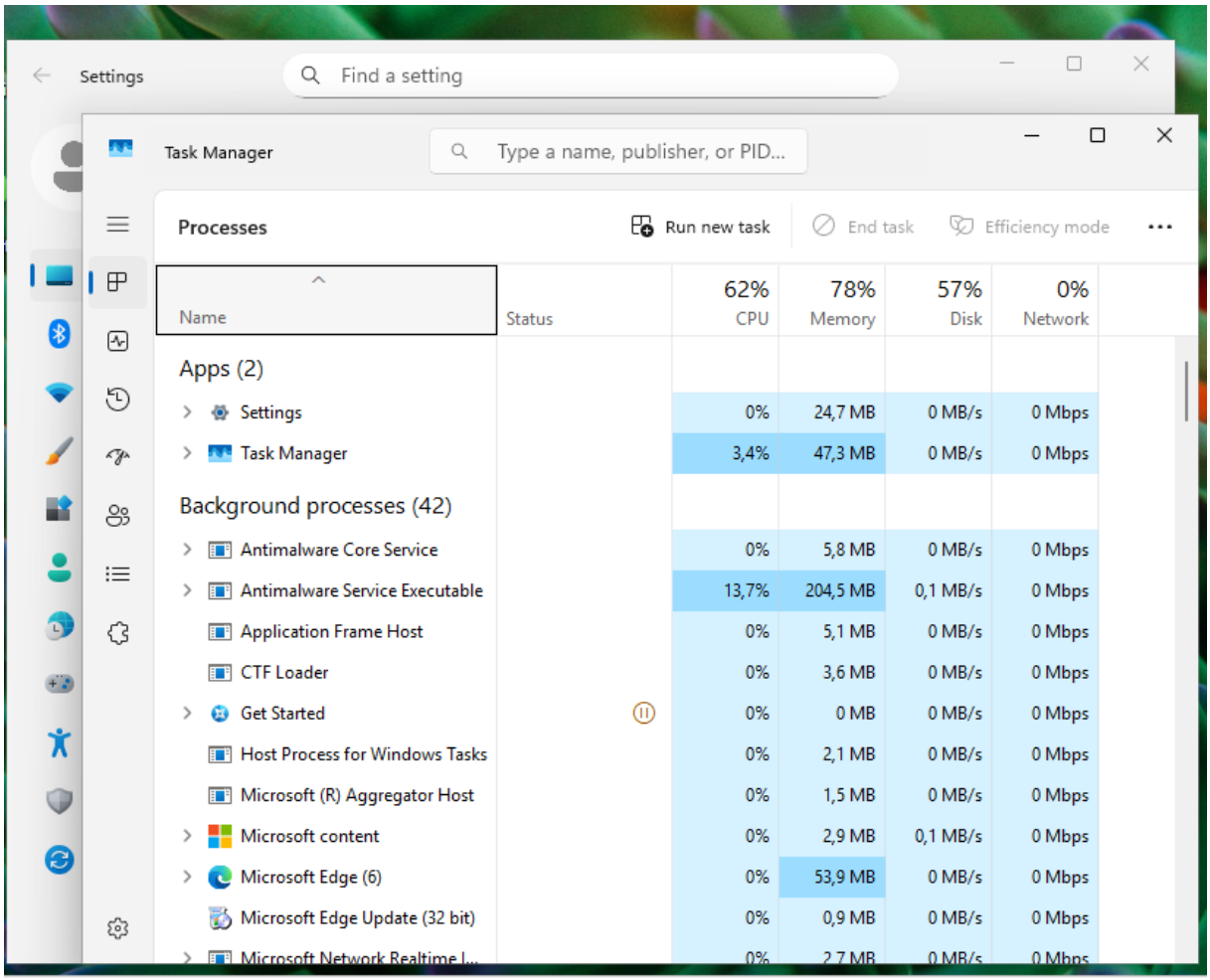
a) Practice for about 10 minutes with the ⊞ keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.

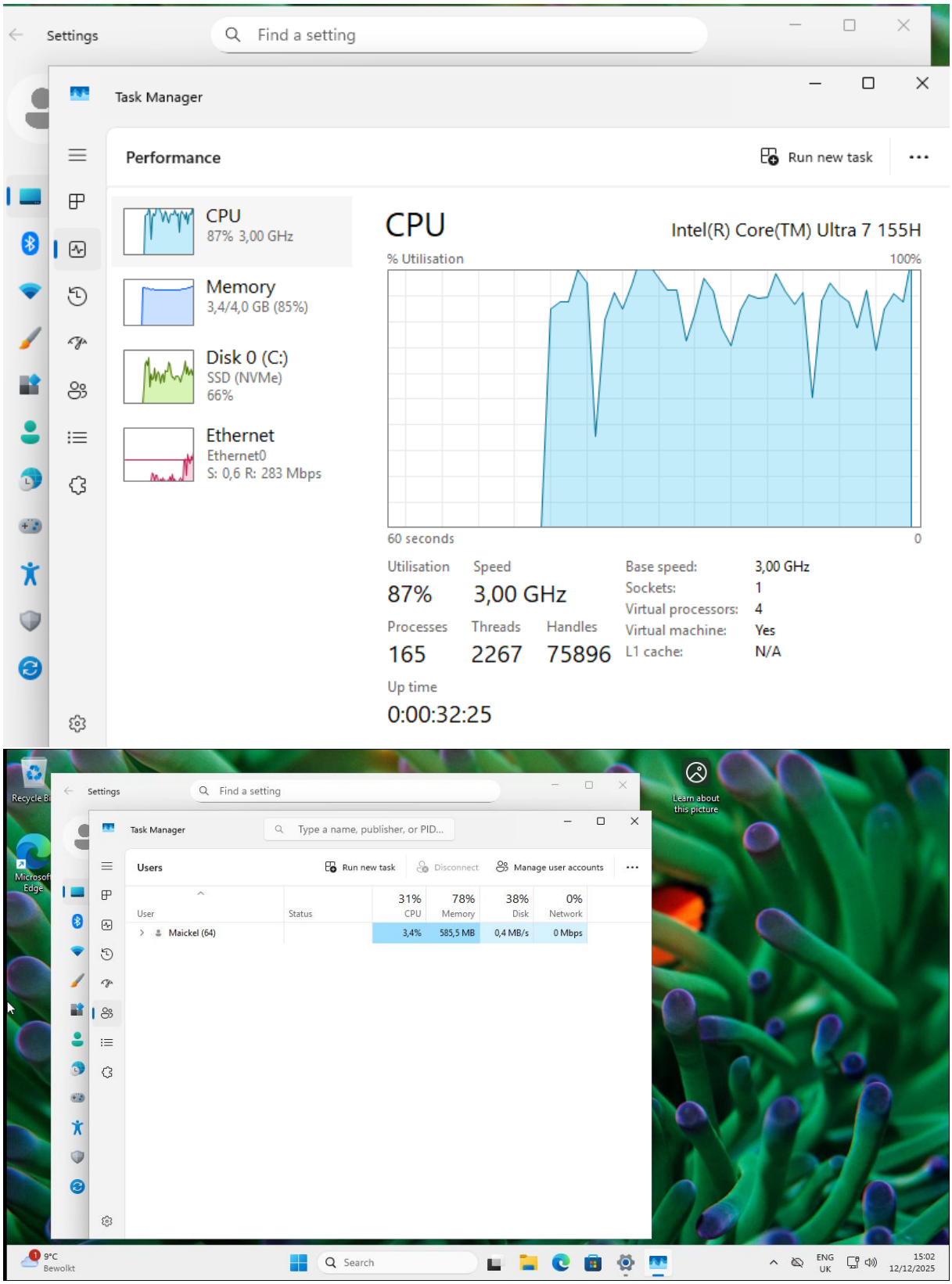
b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?
⊞ + X After E

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.


Settings
Find a setting
Task Manager
Type a name, publisher, or PID...
Processes
Run new task
End task
Efficiency mode
Name
Status
62%
CPU
78%
Memory
57%
Disk
0%
Network
Apps (2)
Settings 0% 24,7 MB 0 MB/s 0 Mbps
Task Manager 3,4% 47,3 MB 0 MB/s 0 Mbps
Background processes (42)
Antimalware Core Service 0% 5,8 MB 0 MB/s 0 Mbps
Antimalware Service Executable 13,7% 204,5 MB 0,1 MB/s 0 Mbps
Application Frame Host 0% 5,1 MB 0 MB/s 0 Mbps
CTF Loader 0% 3,6 MB 0 MB/s 0 Mbps
Get Started 0% 0 MB 0 MB/s 0 Mbps
Host Process for Windows Tasks 0% 2,1 MB 0 MB/s 0 Mbps
Microsoft (R) Aggregator Host 0% 1,5 MB 0 MB/s 0 Mbps
Microsoft content 0% 2,9 MB 0,1 MB/s 0 Mbps
Microsoft Edge (6) 0% 53,9 MB 0 MB/s 0 Mbps
Microsoft Edge Update (32 bit) 0% 0,9 MB 0 MB/s 0 Mbps

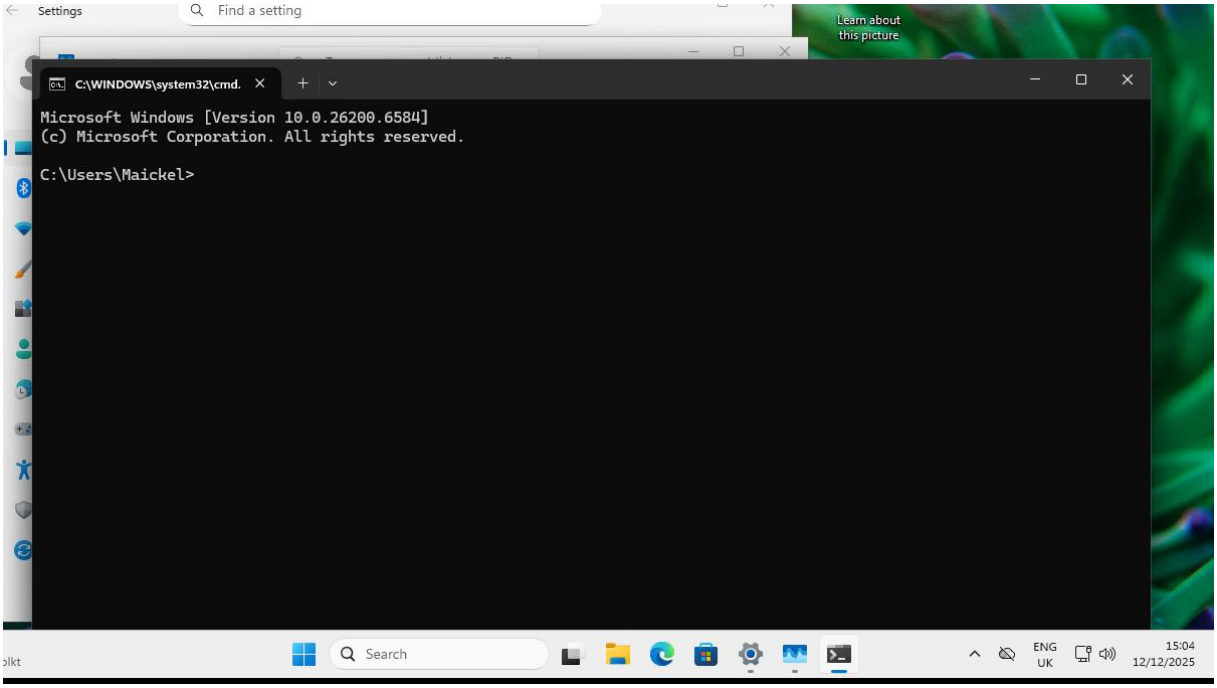


e) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector,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

+ 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?
+ 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

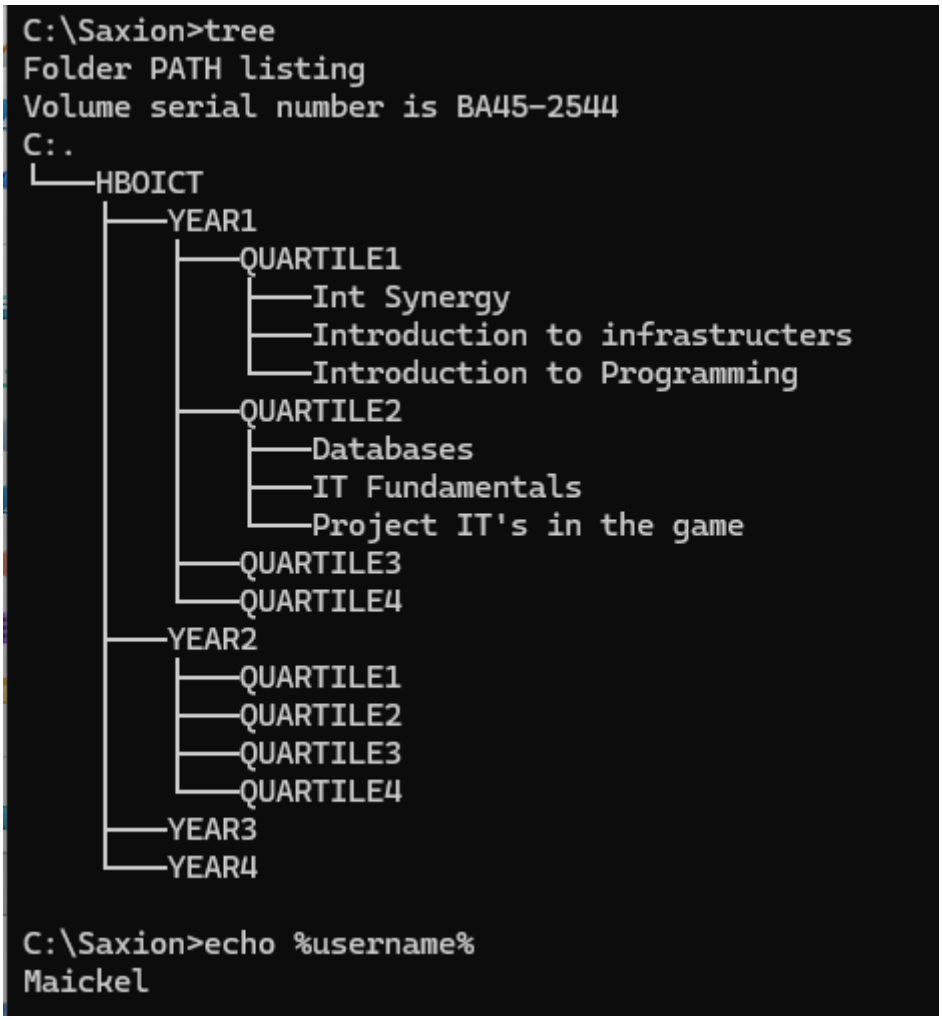
Relevant screenshots **copy** command:

```
C:\Saxion>copy wave.png "C:\Saxion\HBOICT\YEAR1\QUARTILE1\Introduction to Programming"
        1 file(s) copied.
```

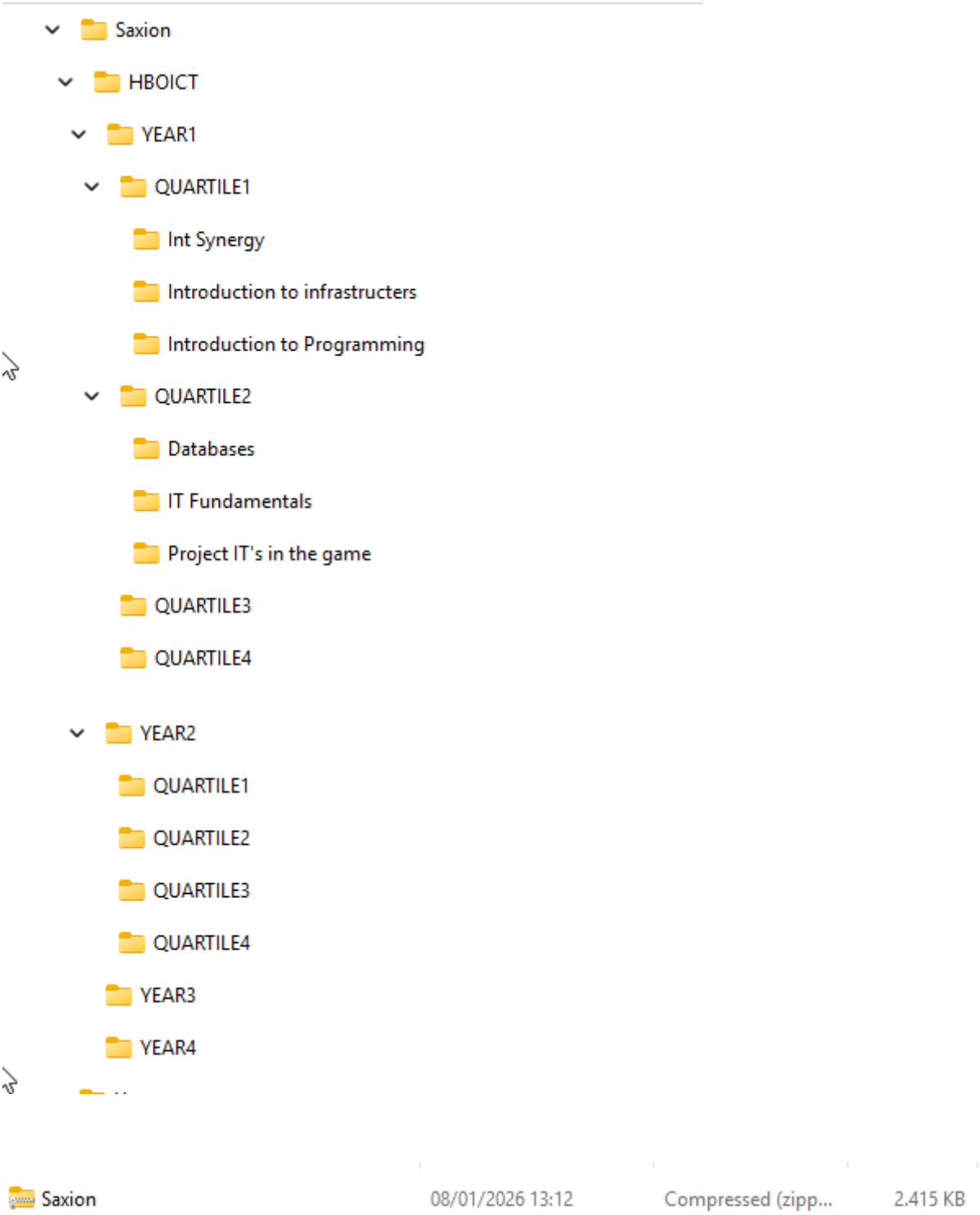
```
C:\Saxion>copy plug.png "C:\Saxion\HBOICT\YEAR1\QUARTILE1\Introduction to infrastructers"
        1 file(s) copied.
```

```
C:\Saxion>copy tumble.png "HBOICT\YEAR1\QUARTILE1\Int Synergy"
        1 file(s) copied.
```

Relevant screenshots **tree** command:

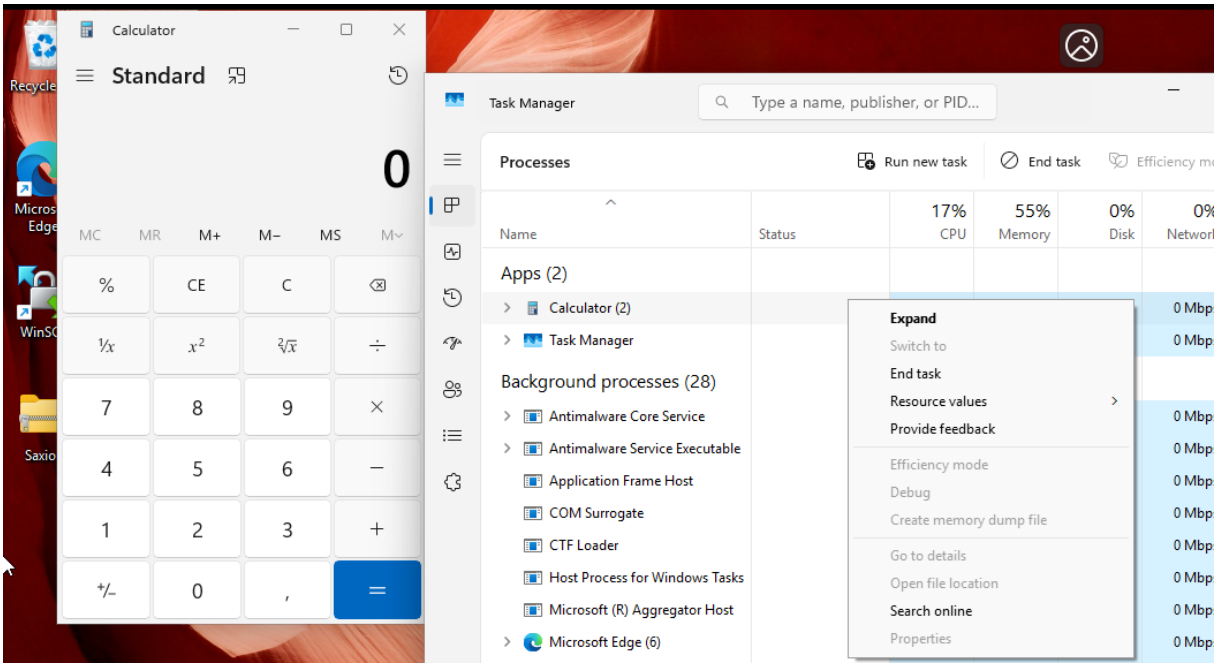


Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.


Saxion
HBOICT
YEAR1
QUARTILE1
Int Synergy
Introduction to infrastructers
Introduction to Programming
QUARTILE2
Databases
IT Fundamentals
Project IT's in the game
QUARTILE3
QUARTILE4
YEAR2
QUARTILE1
QUARTILE2
QUARTILE3
QUARTILE4
YEAR3
YEAR4
Saxion
08/01/2026 13:12
Compressed (zipp...
2.415 KB

Terminating Processes

Relevant Screenshots Task Manager Window:



Install Software

Relevant screenshots that the following software is installed with winget:

- WinSCP

```
C:\Users\Maickel>winget install WinSCP
The `msstore` source requires that you view the following agreements before using.
Terms of Transaction: https://aka.ms/microsoft-store-terms-of-transaction
The source requires the current machine's 2-letter geographic region to be sent to the backend service to function prope
rly (ex. "US").

Do you agree to all the source agreements terms?
[Y] Yes  [N] No: y
Found WinSCP [WinSCP.WinSCP] Version 6.5.5
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://sourceforge.net/projects/winscp/files/WinSCP/6.5.5/WinSCP-6.5.5-Setup.exe/download
  11.6 MB / 11.6 MB
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator. Expect a prompt.
Successfully installed
```

- Notepad++

```
C:\Users\Maickel>winget install Notepad++
Found Notepad++ [Notepad++.Notepad++] Version 8.8.9
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://github.com/notepad-plus-plus/notepad-plus-plus/releases/download/v8.8.9/npp.8.8.9.Installer.x64.exe
  6.54 MB / 6.54 MB
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator. Expect a prompt.
Successfully installed
```

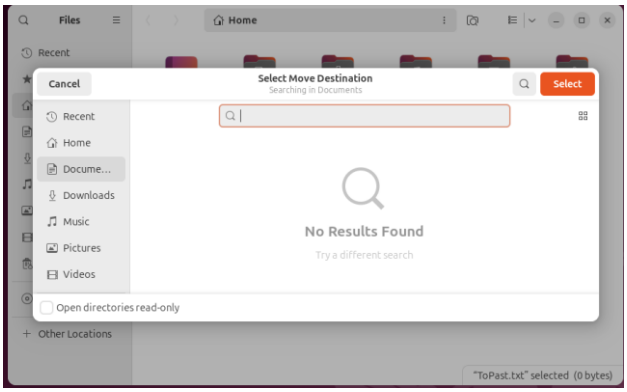
- 7zip

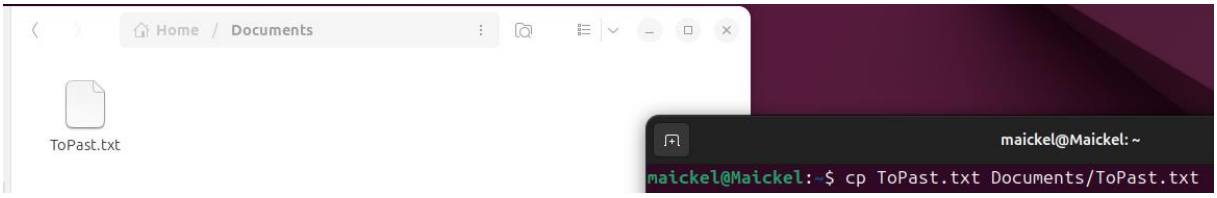
```
C:\Users\Maickel>winget install 7zip
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Downloading https://7-zip.org/a/7z2501-x64.exe
   1.56 MB / 1.56 MB
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator. Expect a prompt.
Successfully installed
```

Assignment 5.4: Working with Linux

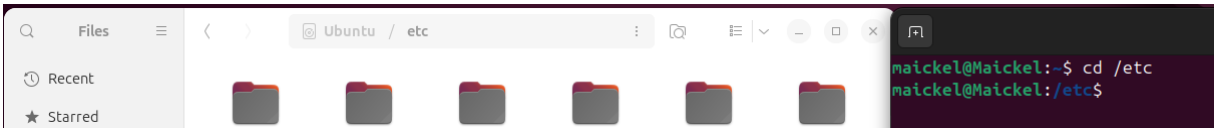
Relevant screenshots + motivation

Copy file:





Navigating:

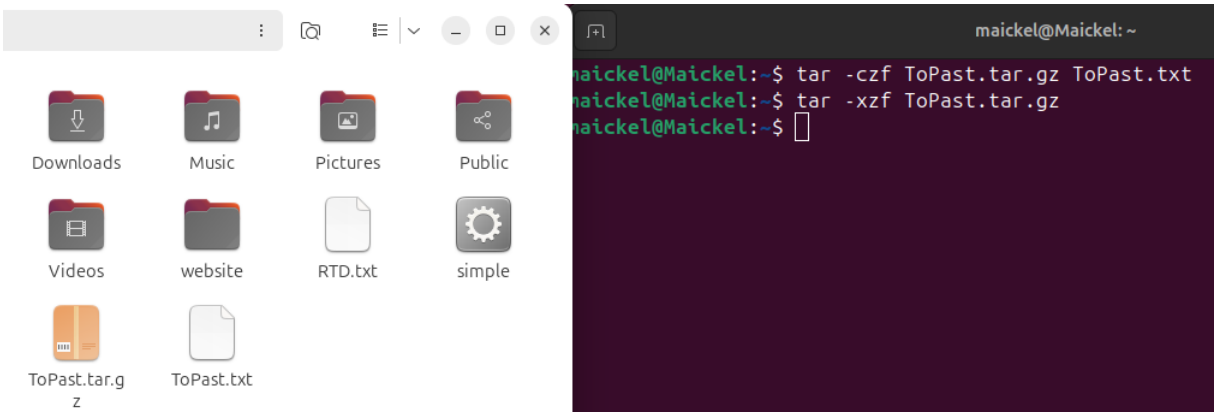


To go back to the home directory just do cd <enter>

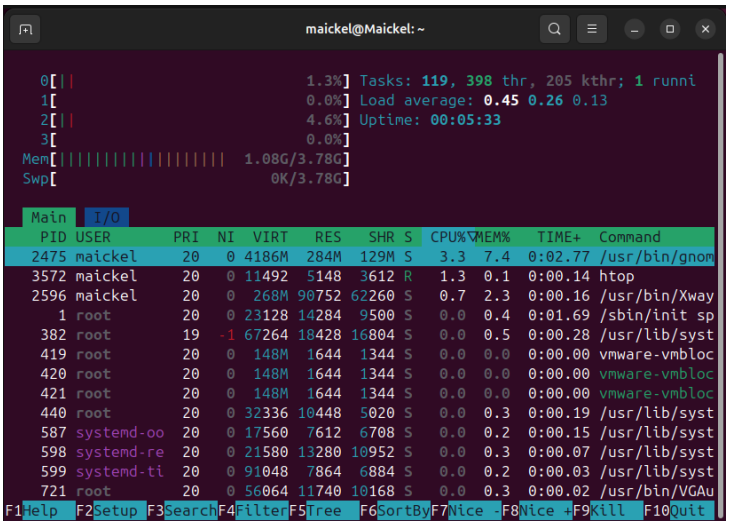
A big difference between linux and windows explorer is: on linux everything falls under the “/” while in windows you have different discs like the c:/ or f:/

The etc directory is a place where mostly system settings are stored.

Compress Files:

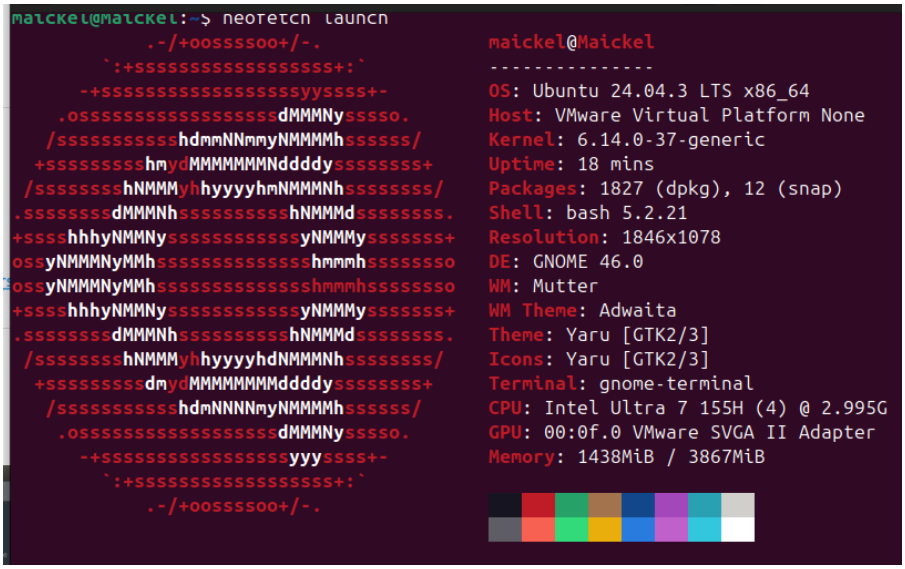


View processes:



Here you can see the Usage of you pc, what is getting used by what and how much (The same as task manager on windows).

Install software:



Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation

```
maickel@Maickel:~/hello$ chmod 744 hello.sh
maickel@Maickel:~/hello$ ls -l hello.sh
-rwxr--r-- 1 maickel maickel 41 Jan  8 17:55 hello.sh
```

Assignment 5.6: View the contents of files

Relevant screenshots + motivation

Cat: Showes the document in a txt editor in the terminal.

Wc: Count the number of rows, words or characters in a file.

Less: Opens the document in a read only manner.

Tail: shows the last x number of rows (standard 10).

Head: shows the first x number of rows (standard 10 also).

Grep: Searches for a set string in the txt.

SherlockHolmes.txt has:

12306 lines, 107562 words and 607504 characters

The word “kingdom” is on line: 490 and 1124

Above the word kingdom:

```
maickel@Maickel:~/Documents$ head -n 245 SherlockHolmes.txt | tail -n 11
“Precisely. And the man who wrote the note is a German. Do you note the
peculiar construction of the sentence—‘This account of you we have from
all quarters received.’ A Frenchman or Russian could not have written
that. It is the German who is so uncourteous to his verbs. It only
remains, therefore, to discover what is wanted by this German who
writes upon Bohemian paper and prefers wearing a mask to showing his
face. And here he comes, if I am not mistaken, to resolve all our
doubts.”

As he spoke there was the sharp sound of horses’ hoofs and grating
wheels against the curb, followed by a sharp pull at the bell. Holmes
```

Below the word kingdom:

```
maickel@Maickel:~/Documents$ tail -n +246 SherlockHolmes.txt | head -n 10
whistled.

“A pair, by the sound,” said he. “Yes,” he continued, glancing out of
the window. “A nice little brougham and a pair of beauties. A hundred
and fifty guineas apiece. There’s money in this case, Watson, if there
is nothing else.”

“I think that I had better go, Holmes.”

“Not a bit, Doctor. Stay where you are. I am lost without my Boswell.
```

Assignment 5.7: Digital forensics

Relevant screenshots + motivation

Phone:

Moto g(6) play

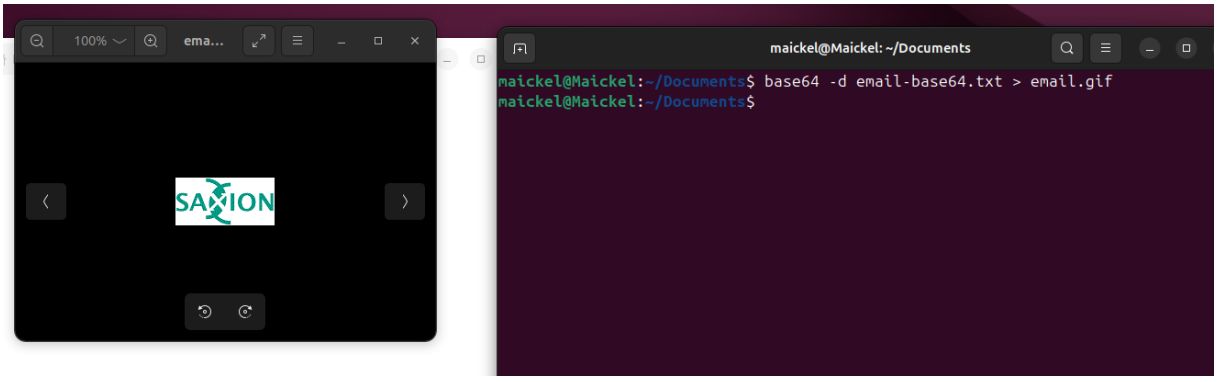
Location of the photo is:

2 Piccardtlaan
Groningen

Ubuntu does still consider the image a .jpeg.

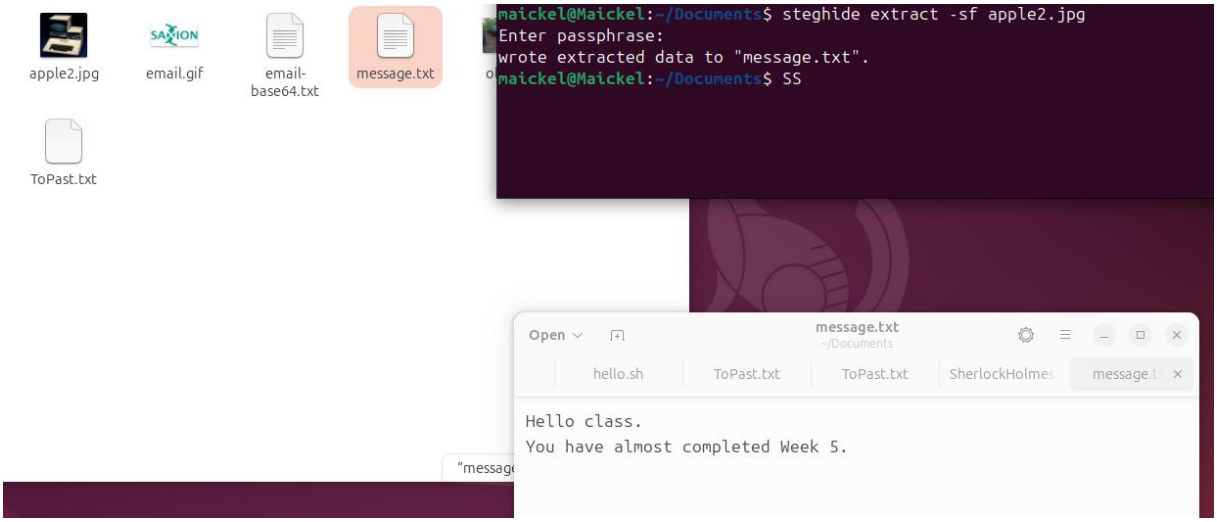
Command to turn it to a .gif:

base64 -d email-base64.txt > email.gif



Assignment 5.8: Steganography

Relevant screenshots + motivation



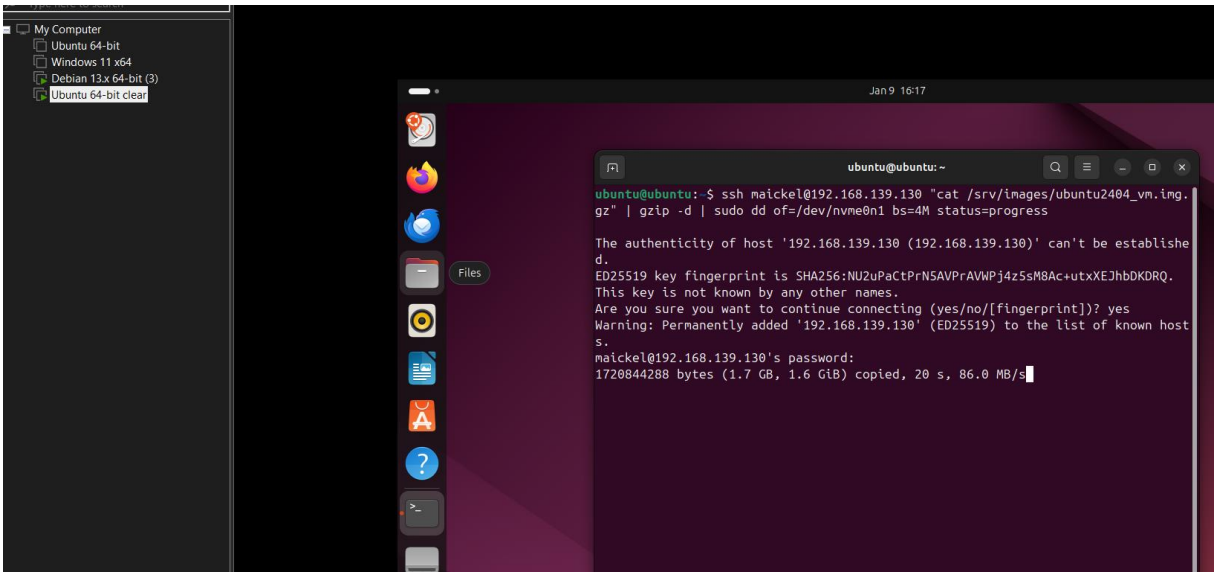
Assignment 5.9: Capture disk images

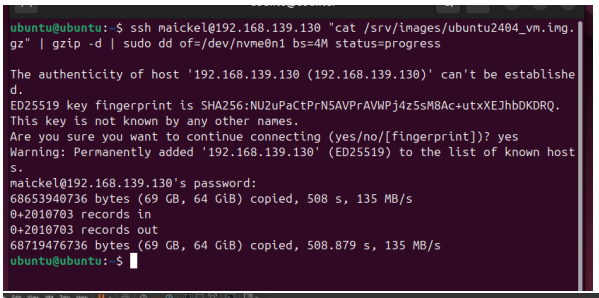
Make relevant screenshots + motivation:

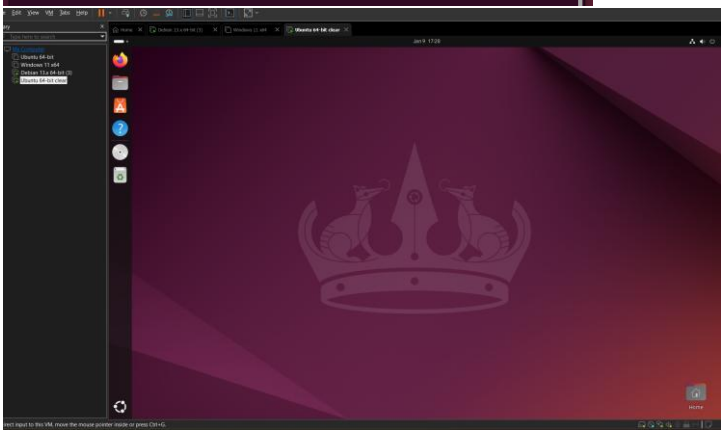
- Proof that the Debian 13 server stored a back-up image of the Ubuntu 24.04 Desktop VM.

```
ubuntu@ubuntu:~$ sudo dd if=/dev/nvme0n1 bs=4M status=progress | gzip | ssh maic
kel@192.168.139.130 "cat > /srv/images/ubuntu2404_vm.img.gz"
maickel@192.168.139.130's password:
276824064 bytes (277 MB, 264 MiB) copied, 11 s, 24.9 MB/s
```

- Proof that you can restore the back-up image into an empty VM.







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