

# Template Week 5 – Operating Systems

Student number: 546746

## Assignment 5.1: Unix-like

- a) Find out what the difference is between UNIX and unix-like operating systems?  
**UNIX** is the original, officially certified operating system developed by AT&T, while **Unix-like** refers to systems that behave like UNIX and follow its design principles but are **not officially certified** and are **not based on the original UNIX source code**, such as Linux and BSD.
- 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:** Co-creator of **UNIX**; designed the **B** language; introduced core OS concepts.
  - **Dennis Ritchie:** Co-creator of **UNIX**; created the **C** programming language.
  - **Bill Joy:** Key developer of **BSD**; created the **vi** editor; contributed to SunOS.
  - **Richard Stallman:** Founded the **GNU Project**; started the free software movement; built essential UNIX-like tools.
  - **Linus Torvalds:** Created the **Linux kernel**, foundation of modern Unix-like systems.
- c) What is the philosophy of the GNU movement?
- The GNU movement is based on the idea that **software should be free**—not in price, but in freedom.
  - It promotes the user's rights to **run, study, modify, and share** software.
  - Its goal is to ensure that computing is controlled by users, not by companies or restrictive licenses.
- d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.
- Partly yes, partly no.**
- Yes: Ubuntu includes many GNU tools (like GCC, Bash, and GNU utilities), is mostly open-source, and allows users to study, modify, and share most of the system. This supports the core GNU philosophy of software freedom.
  - No: Ubuntu also includes some non-free (proprietary) drivers, firmware, and optional software, which goes against the strict GNU requirement that *all* software must be 100% free.

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

WSL is a feature in Windows that allows users to **run a real Linux environment directly on Windows**, without needing a virtual machine or dual boot.

It lets you use Linux commands, tools, and applications alongside Windows programs.

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

- **Android** → Belongs to the **Linux family** (built on a modified Linux kernel).
- **iOS** → Belongs to the **Unix family** (based on Darwin, which comes from BSD/Unix).
- **ChromeOS** → Belongs to the **Linux family** (built on the Gentoo Linux distribution).

## 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 used to perform extremely large and complex calculations that normal computers cannot handle. They are mainly used for scientific research, weather and climate modeling, engineering simulations, astrophysics, nuclear research, and analyzing massive datasets. Their high speed allows scientists and engineers to simulate and solve problems that require enormous computing power.

- 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 group of many PS3 consoles connected together and used like a supercomputer. Because the PS3 used the powerful Cell processor (originally developed with IBM), researchers could run Linux on it and use the consoles for scientific computing.

What it was used for:

- Scientific research such as astrophysics and black-hole simulations
- Cryptography and mathematical calculations
- High-performance tasks like image processing (e.g., in the U.S. Air Force's PS3 cluster)
- Distributed computing projects like Folding@home

It became popular because it was a cheap and powerful alternative to traditional supercomputers.

- 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?

The cluster built by Oracle using many Raspberry Pi 3B+ boards runs the operating system Oracle Linux.

- 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/>

No. Oracle's Raspberry Pi cluster is **not** on the TOP500 list, because Raspberry Pi hardware is far too weak to reach the performance levels required for the 500 fastest supercomputers in the world.

e) What CPU architecture is used for the PlayStation 5 and Xbox Series X?

What operating systems run on these consoles?

PlayStation 5

- CPU Architecture: AMD x86-64 (Zen 2)
- Operating System: A custom Orbis OS, based on FreeBSD (a Unix-like system)

Xbox Series X

- CPU Architecture: AMD x86-64 (Zen 2)
- Operating System: A custom version of Windows 10/Windows Core OS designed for Xbox consoles

What conclusion can you draw from the answer to the previous question?

Although PlayStation 5 and Xbox Series X compete with each other, they use very similar hardware (x86-64 CPUs from AMD). The main difference between them comes from the operating system and software ecosystem, not the processor architecture.

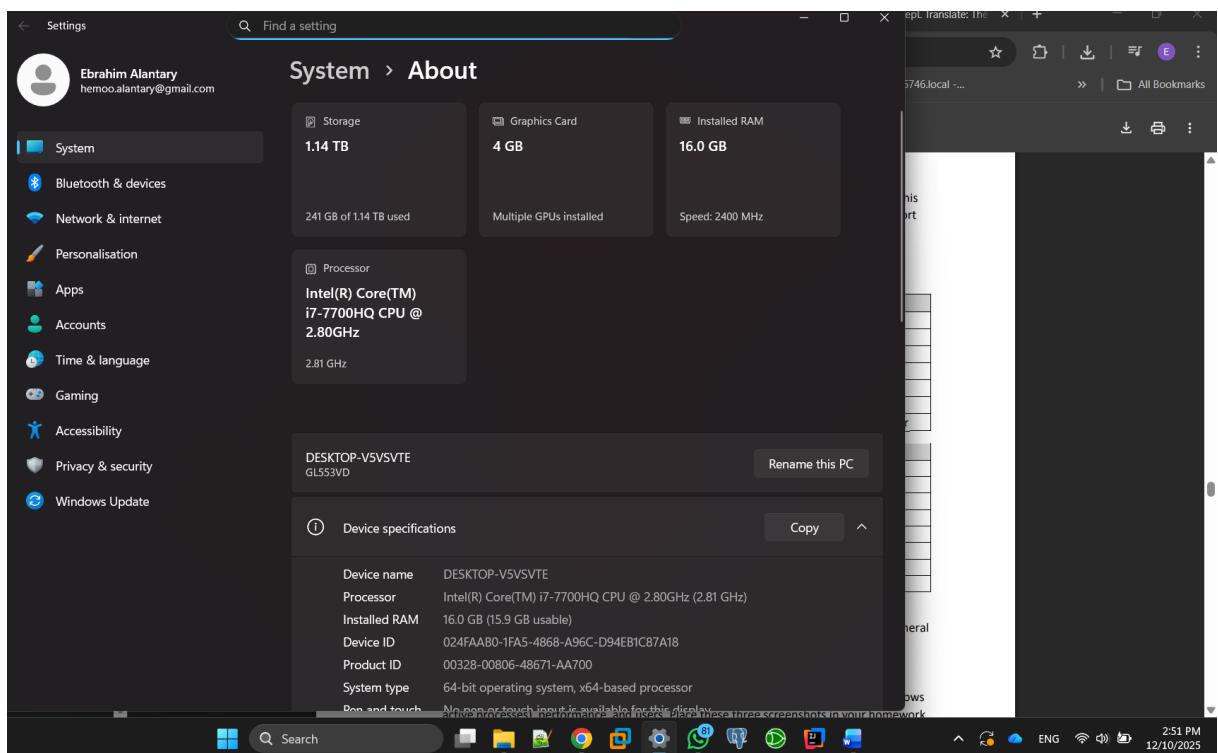
## Assignment 5.3: Working with Windows

**Take relevant screenshots of the assignments below**

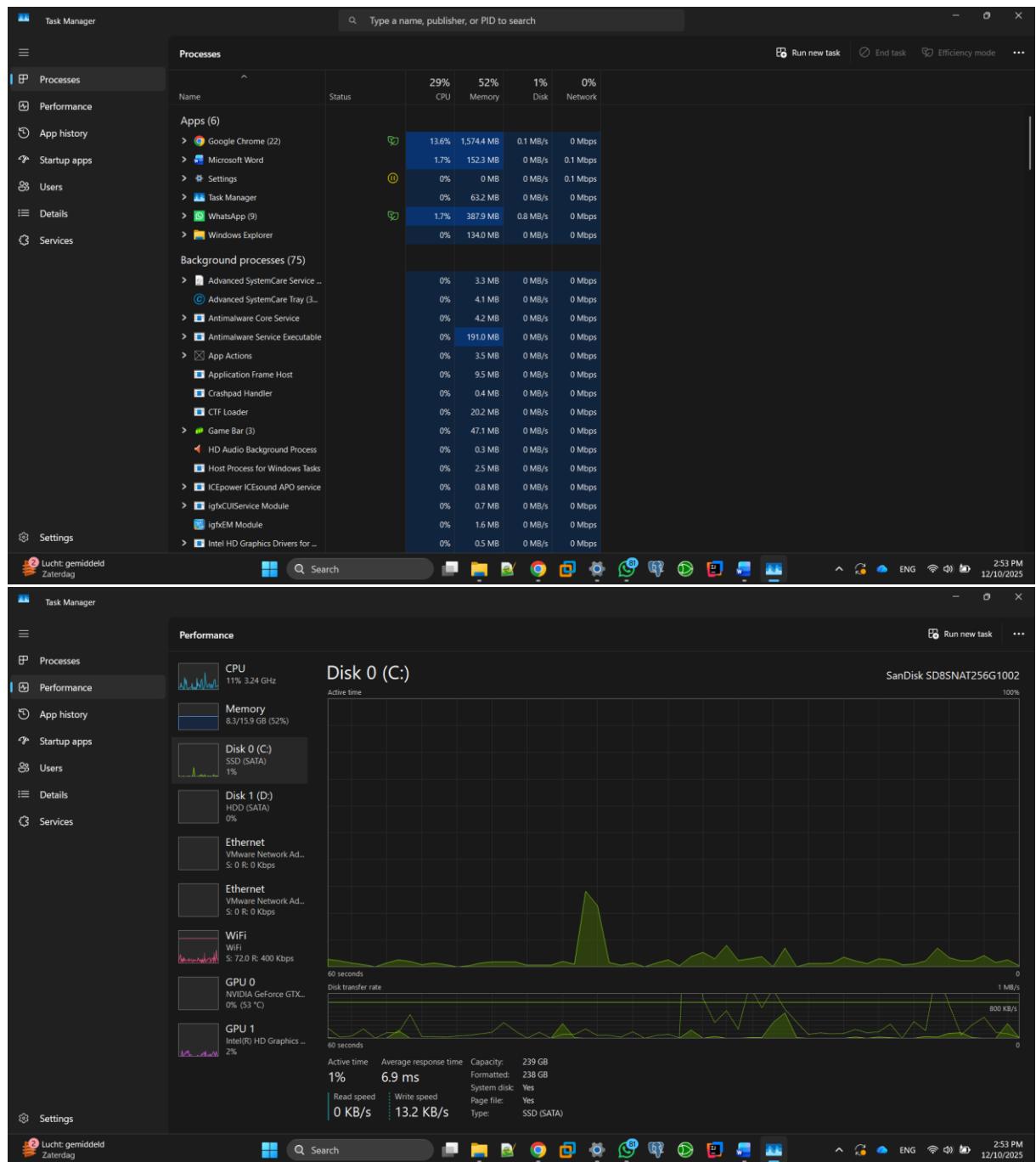
- a) Practice for about 10 minutes with the  keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.
  
  - b) The file explorer can be opened with  + E, Which key combination could you also use?

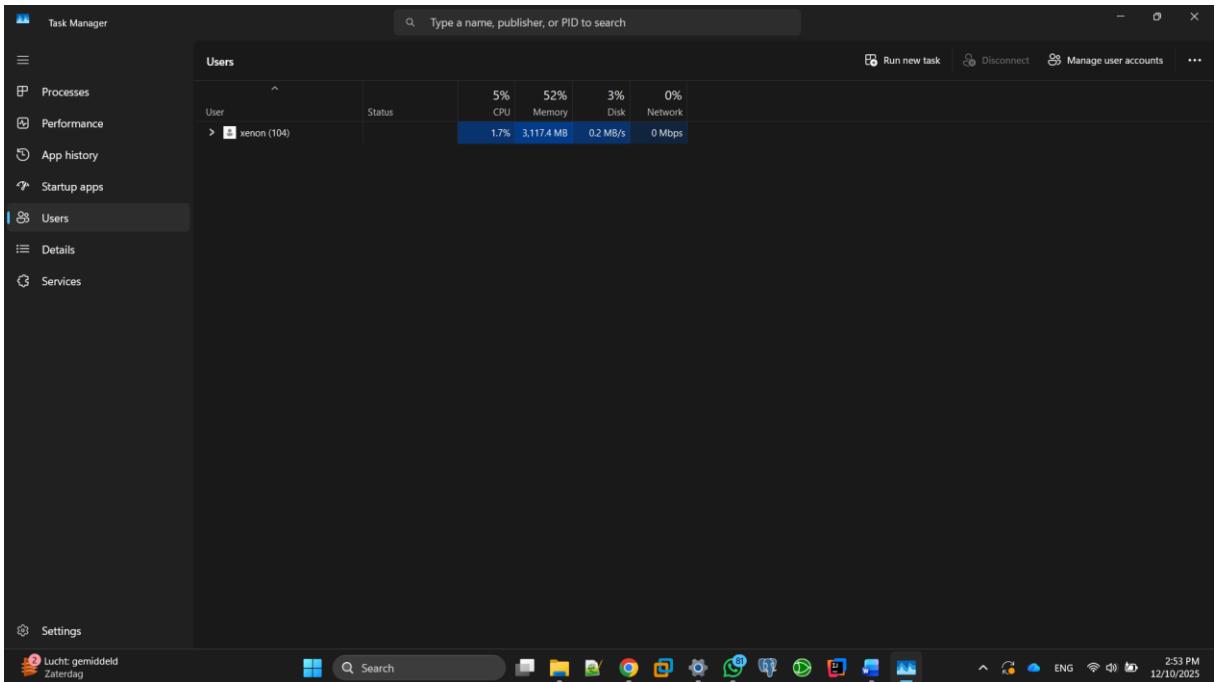
**Windows + X → then press E**

- 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.





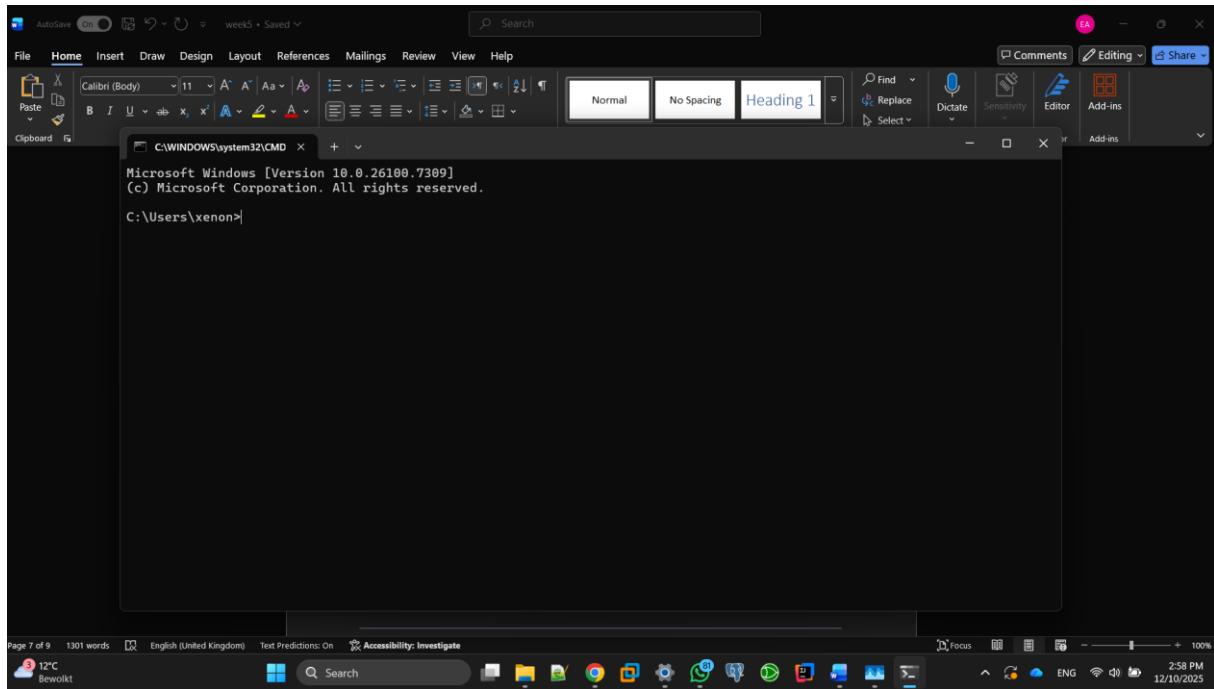
- e) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector,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

#### **Windows Key + 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?

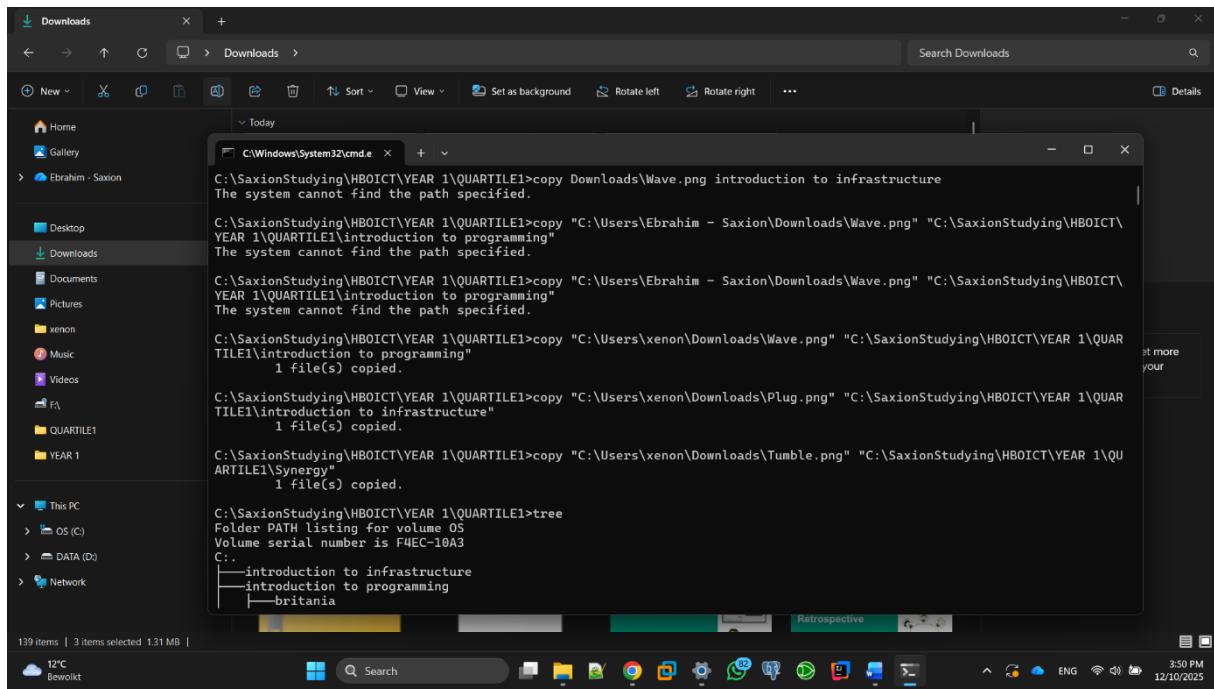
#### **Windows Key + L**

- 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.

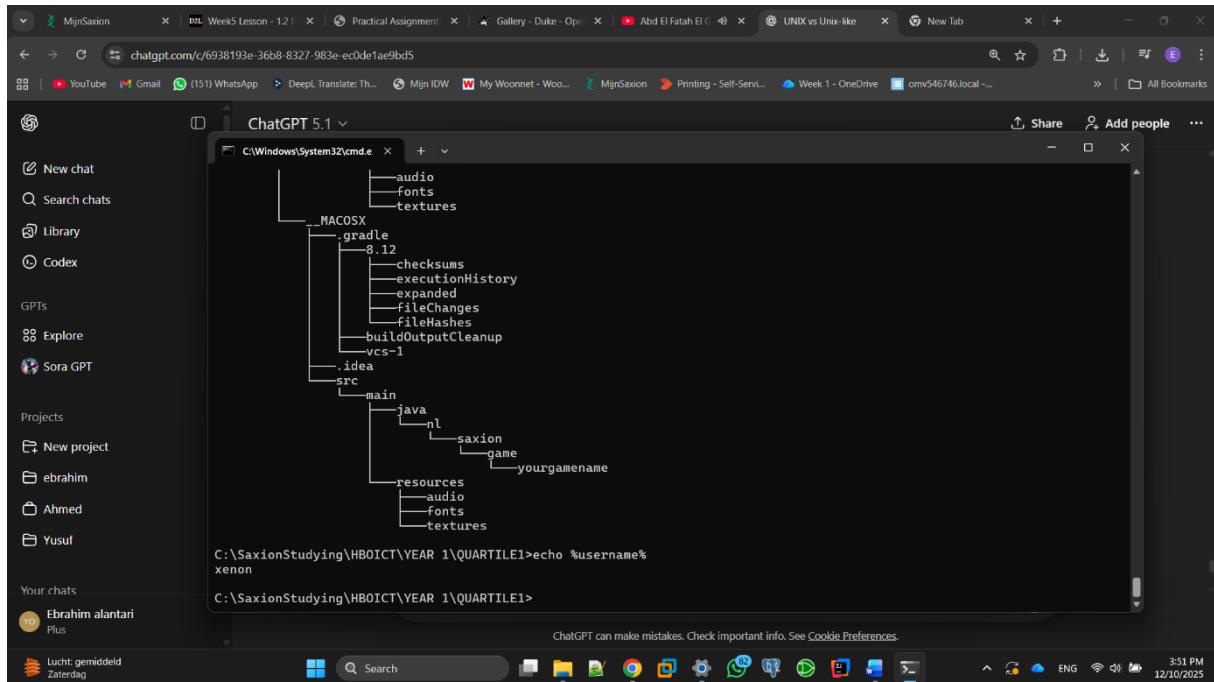


## Working in the File Explorer

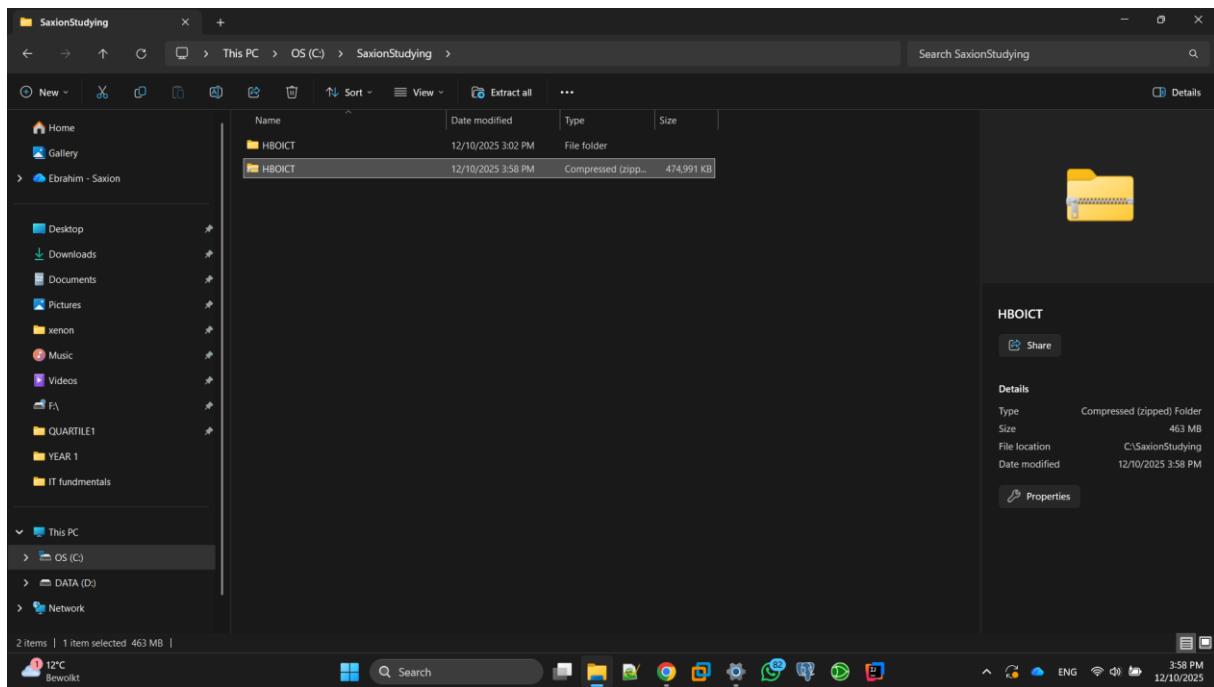
Relevant screenshots **copy** command:



Relevant screenshots **tree** command:

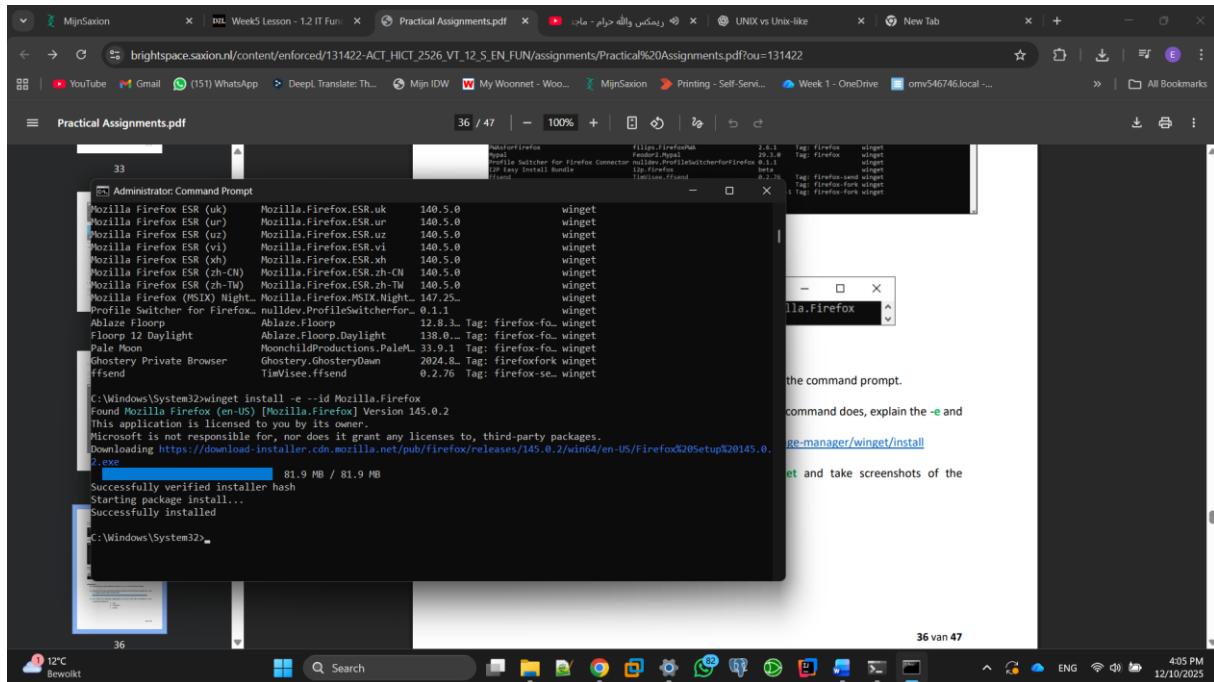


Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



## Terminating Processes

Relevant Screenshots Task Manager Window:



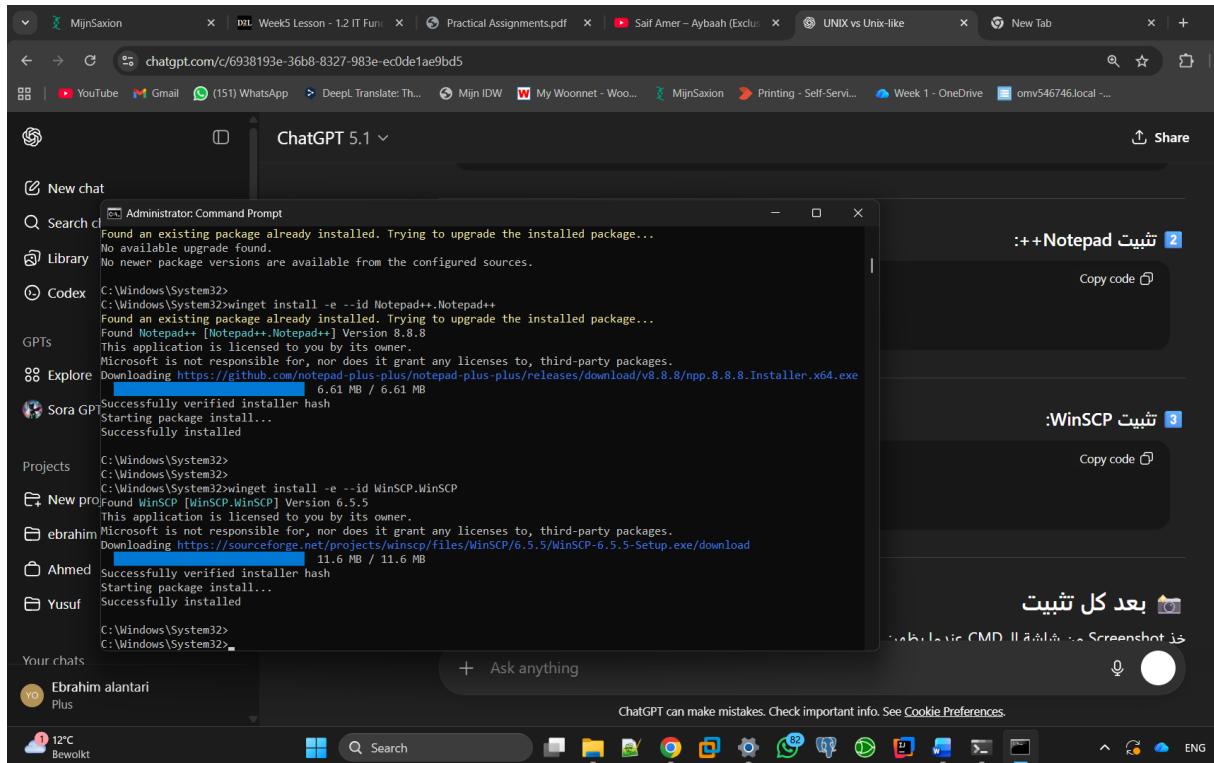
installs Firefox using the Windows package manager (winget).

- **install**  
Tells winget to download and install the application.
- **-e (exact match)**  
This option tells winget to look for an *exact* match of the package ID.  
It prevents installing the wrong package that might have a similar name.
- **--id Mozilla.Firefox**  
This is the unique package ID for Firefox in the winget repository.  
It makes sure that winget installs the correct Firefox package.

## Install Software

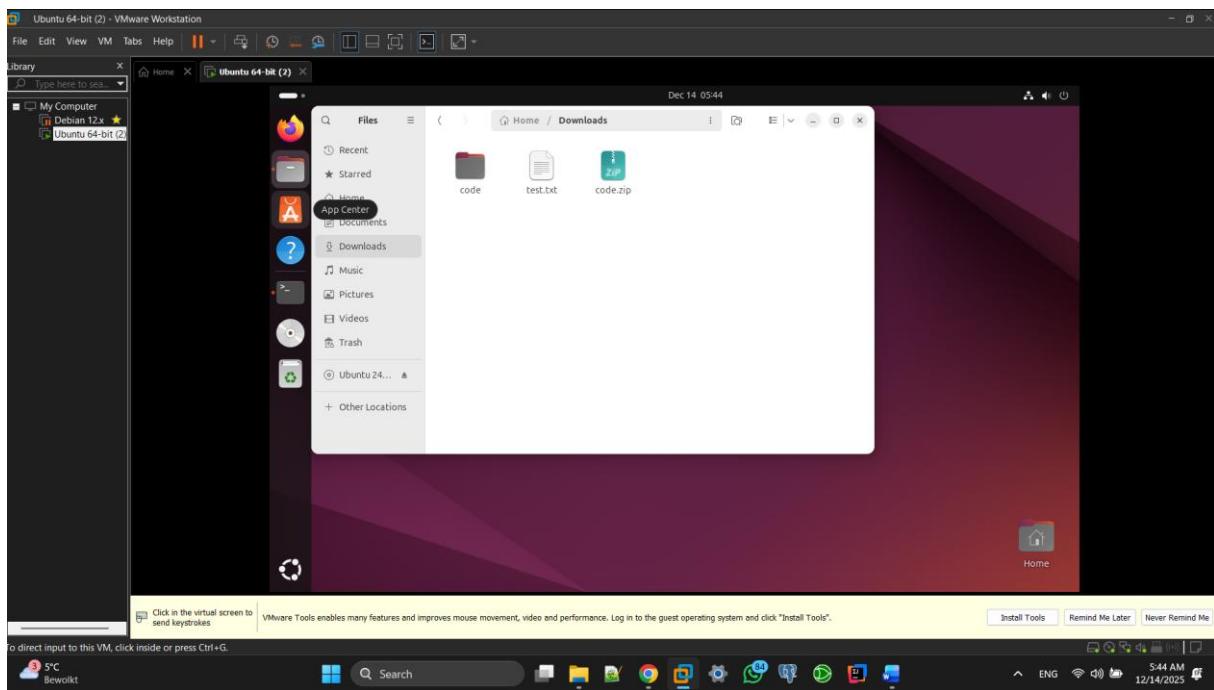
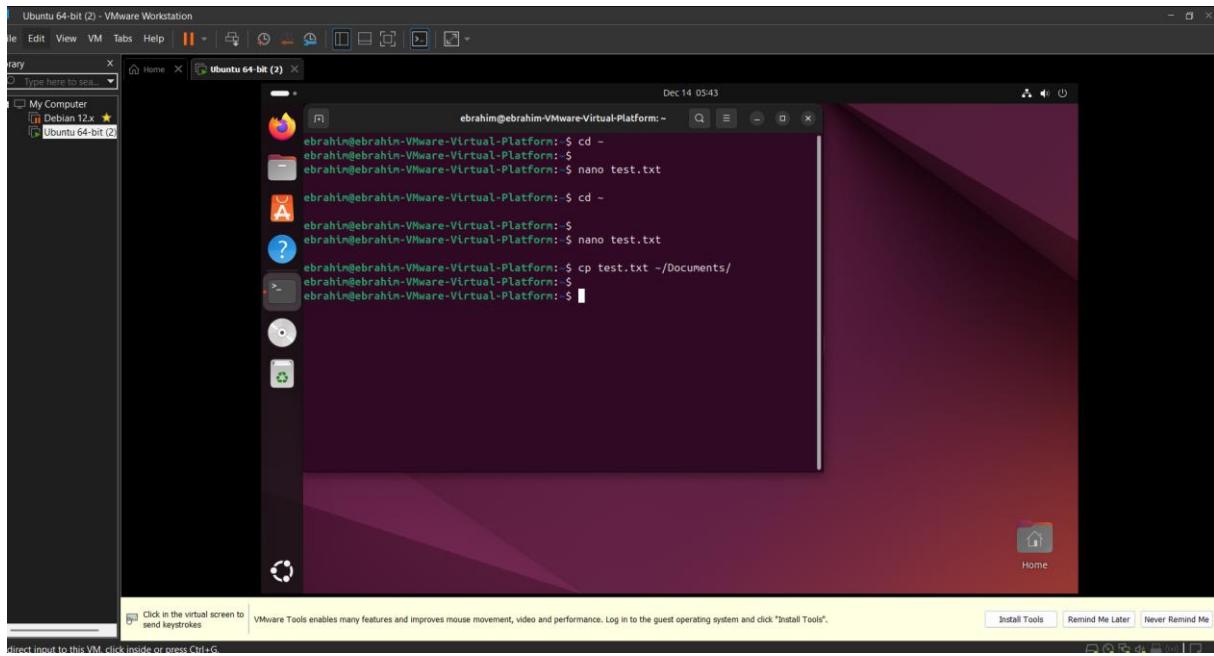
Relevant screenshots that the following software is installed with winget:

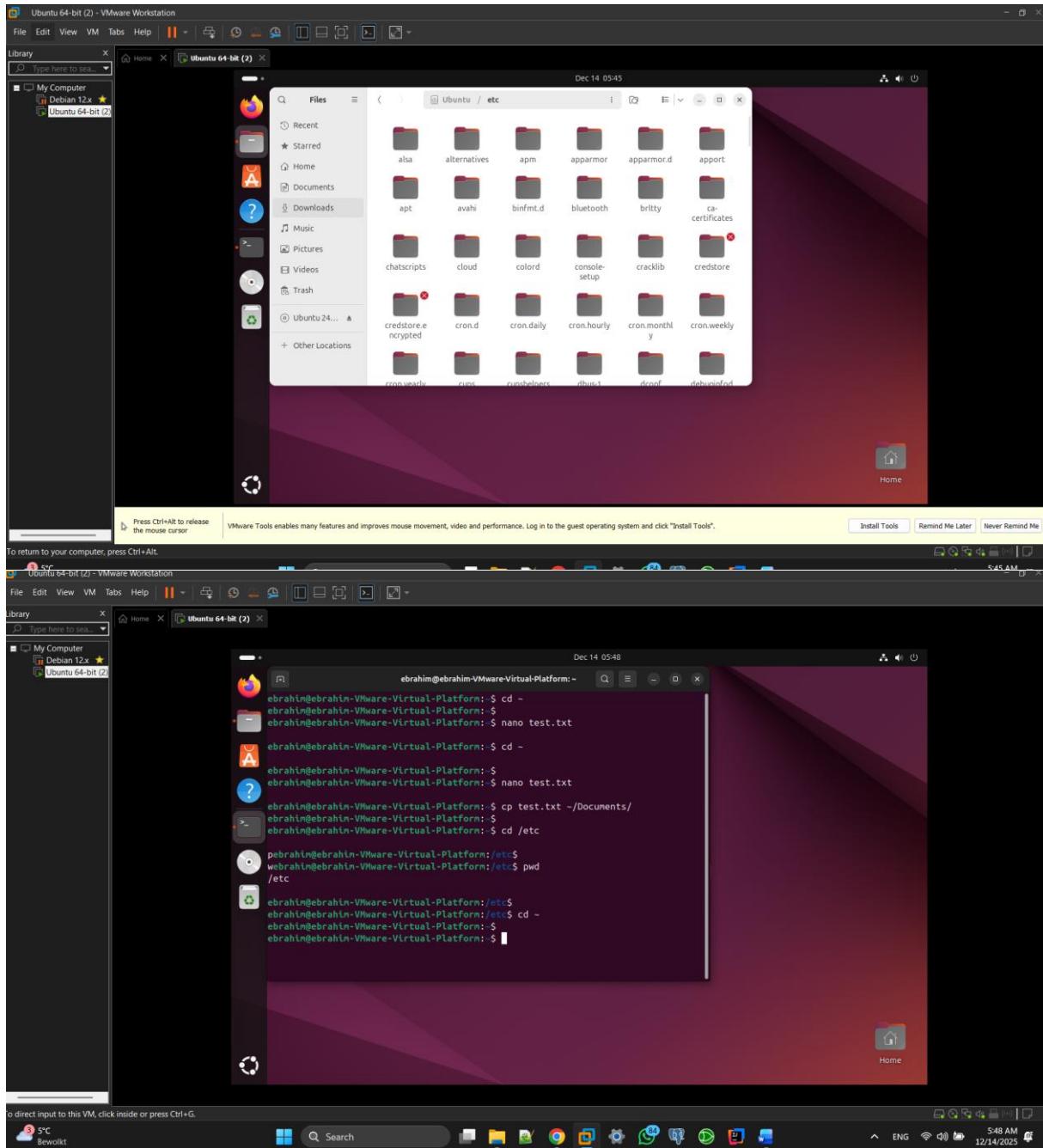
- WinSCP
- Notepad++
- 7zip



## Assignment 5.4: Working with Linux

Relevant screenshots + motivation





Linux uses a single root file system (/) instead of drive letters like C: or D: in Windows.

The /etc directory stores system-wide configuration files.

```

Ubuntu 64-bit (2) - VMware Workstation
File Edit View VM Tabs Help || Library Home Ubuntu 64-bit (2)

Dec 14 05:50
ebrahim@ebrahim-VMware-Virtual-Platform:~$ cp test.txt ~/Documents/
ebrahim@ebrahim-VMware-Virtual-Platform:~$ cd /etc
ebrahim@ebrahim-VMware-Virtual-Platform:~/etc$ pwd
/etc
ebrahim@ebrahim-VMware-Virtual-Platform:/etc$ cd ~
ebrahim@ebrahim-VMware-Virtual-Platform:~$ tar -cvf test.tar test.txt
test.txt
ebrahim@ebrahim-VMware-Virtual-Platform:~$ tar -czvf test.tar.gz test.txt
test.txt
ebrahim@ebrahim-VMware-Virtual-Platform:~$ tar -xzvf test.tar.gz
test.txt
ebrahim@ebrahim-VMware-Virtual-Platform:~$ ebrahim@ebrahim-VMware-Virtual-Platform:~$ 

```

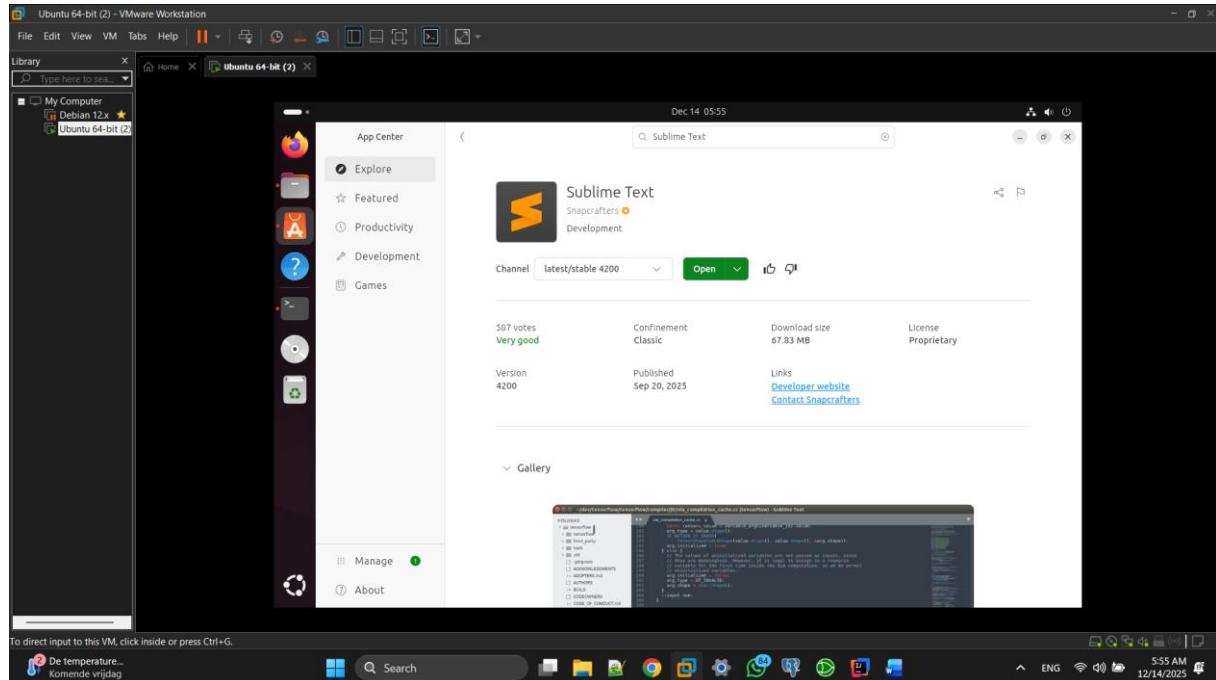
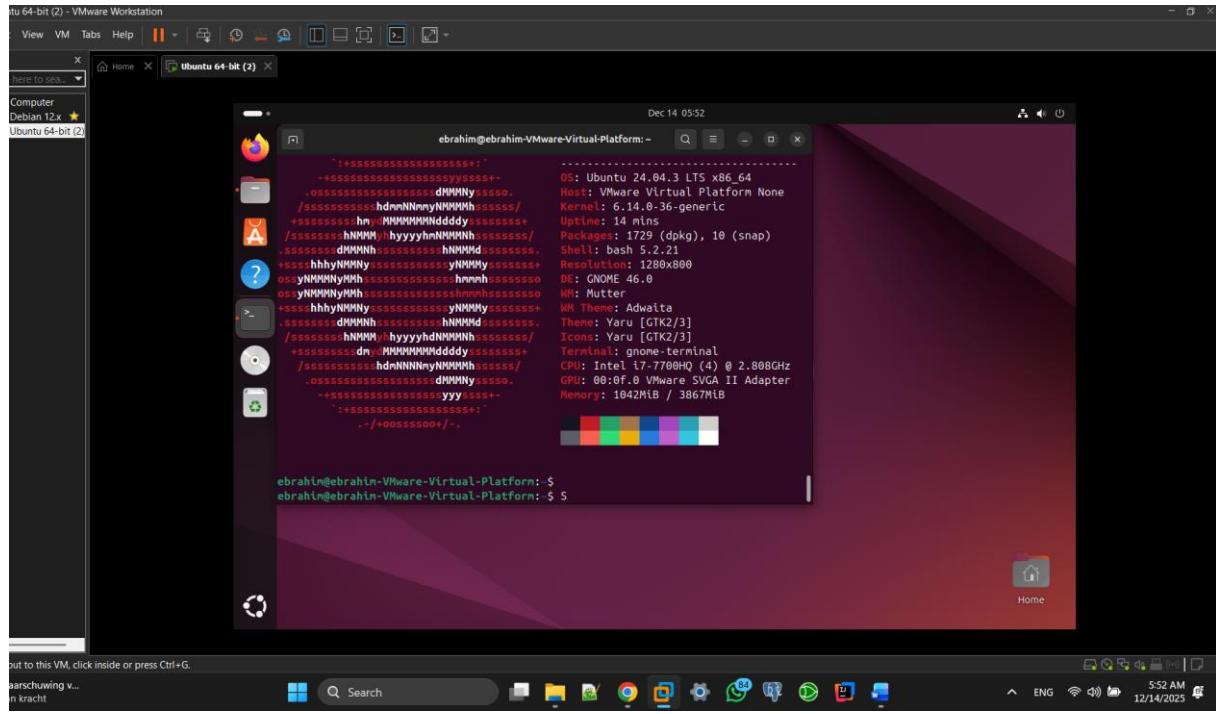
```

Ubuntu 64-bit (2) - VMware Workstation
File Edit View VM Tabs Help || Library Home Ubuntu 64-bit (2)

Dec 14 05:51
ebrahim@ebrahim-VMware-Virtual-Platform:~$ tada [31.4 kB]
Get:28 http://nl.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]
Get:29 http://nl.archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7,128 B]
Get:30 http://nl.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]
Get:31 http://nl.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [11.0 kB]
Get:32 http://nl.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]
Fetched 13.4 MB in 3s (4,172 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
158 packages can be upgraded. Run 'apt list --upgradable' to see them.
ebrahim@ebrahim-VMware-Virtual-Platform:~$ htop
Command 'htop' not found, but can be installed with:
sudo snap install htop # version 3.4.1, or
sudo apt install htop # version 3.2.2-2
See 'snap info htop' for additional versions.
ebrahim@ebrahim-VMware-Virtual-Platform:~$ ebrahim@ebrahim-VMware-Virtual-Platform:~$ 

```

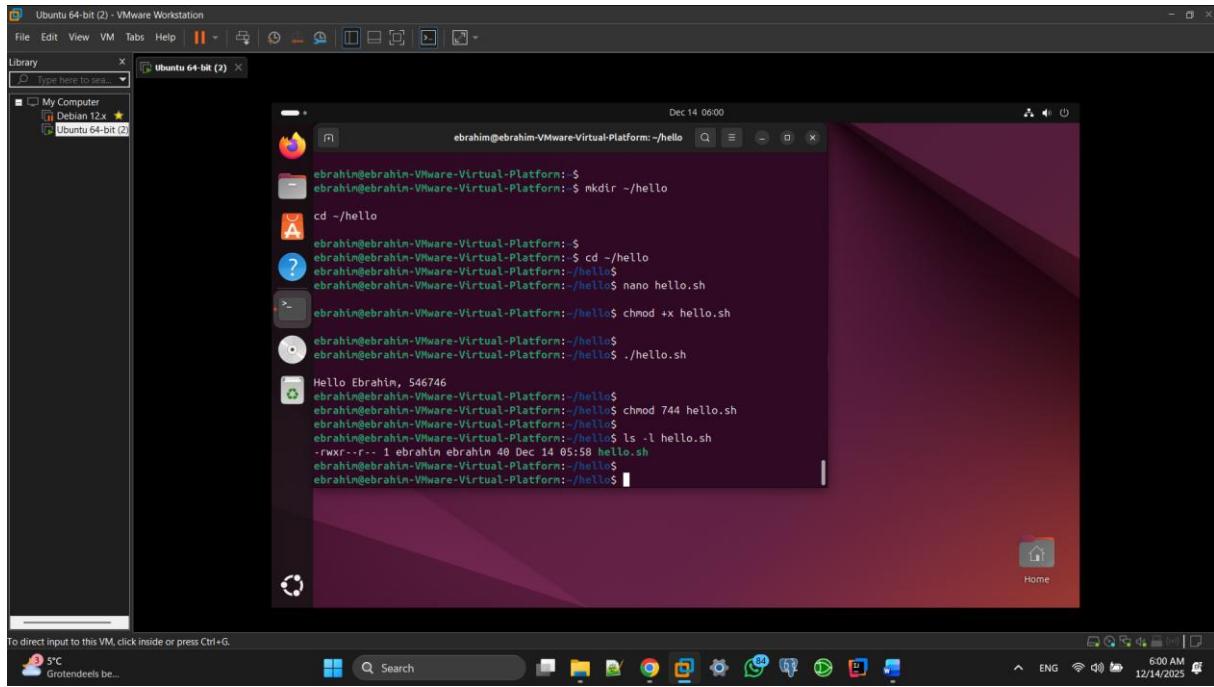
**htop** shows running processes, CPU and memory usage, system load, and active users in real time.



Neofetch shows system information such as OS, kernel, CPU, RAM, and desktop environment.

## Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation



I used the chmod command with numeric notation (744) to make the script executable only for the logged-in user.

Group and other users are only allowed to read the file but not execute it

### Assignment 5.6: View the contents of files

Relevant screenshots + motivation

- **cat**: Displays the entire contents of a file on the screen.
- **wc**: Counts lines, words, and characters in a file.
- **less**: Views a file page by page and allows scrolling.
- **head**: Shows the first lines of a file.
- **tail**: Shows the last lines of a file.
- **grep**: Searches for specific text inside a file.

To direct input to this VM, click inside or press Ctrl+G.

Grotendeels be...

Ubuntu 64-bit (2) - VMware Workstation

File Edit View VM Tabs Help || Library Type here to sea... Ubuntu 64-bit (2)

```
Dec 14 06:03
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ cd ~
```

```
Dec 14 06:03
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ wget https://www.gutenberg.org/files/1661/1661-0.txt -O SherlockHolmes.txt
--2025-12-14 06:02:29-- https://www.gutenberg.org/files/1661/1661-0.txt
Resolving www.gutenberg.org (www.gutenberg.org)... 152.19.134.47, 2610:28:3090:3
000:0:bad:cafe:47
Connecting to www.gutenberg.org (www.gutenberg.org)|152.19.134.47|:443...
HTTP request sent, awaiting response... 200 OK
Length: 607504 (593K) [text/plain]
Saving to: 'SherlockHolmes.txt'
```

```
Dec 14 06:02:30 (1.04 MB/s) - 'SherlockHolmes.txt' saved [607504/607504]
```

```
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ less SherlockHolmes.txt
ebrahim@ebrahim-VMware-Virtual-Platform:~
```

To return to your computer, press Ctrl+Alt.

Grotendeels be...

Ubuntu 64-bit (2) - VMware Workstation

File Edit View VM Tabs Help || Library Type here to sea... Ubuntu 64-bit (2)

```
Dec 14 06:05
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ less SherlockHolmes.txt
ebrahim@ebrahim-VMware-Virtual-Platform:~
```

```
Dec 14 06:05
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ wc SherlockHolmes.txt
12306 107562 607504 SherlockHolmes.txt
ebrahim@ebrahim-VMware-Virtual-Platform:~
```

```
Dec 14 06:05
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ grep -n "kingdom" SherlockHolmes.txt
490:"I tell you that I would give one of the provinces of my kingdom to
1124:And that was how a great scandal threatened to affect the kingdom of
ebrahim@ebrahim-VMware-Virtual-Platform:~
```

```
Dec 14 06:05
ebrahim@ebrahim-VMware-Virtual-Platform:~ -rwxr--r-- 1 ebrahim ebrahim 40 Dec 14 05:58 hello.sh
ebrahim@ebrahim-VMware-Virtual-Platform:~/hello$ sed -n '490,510p' SherlockHolmes.txt

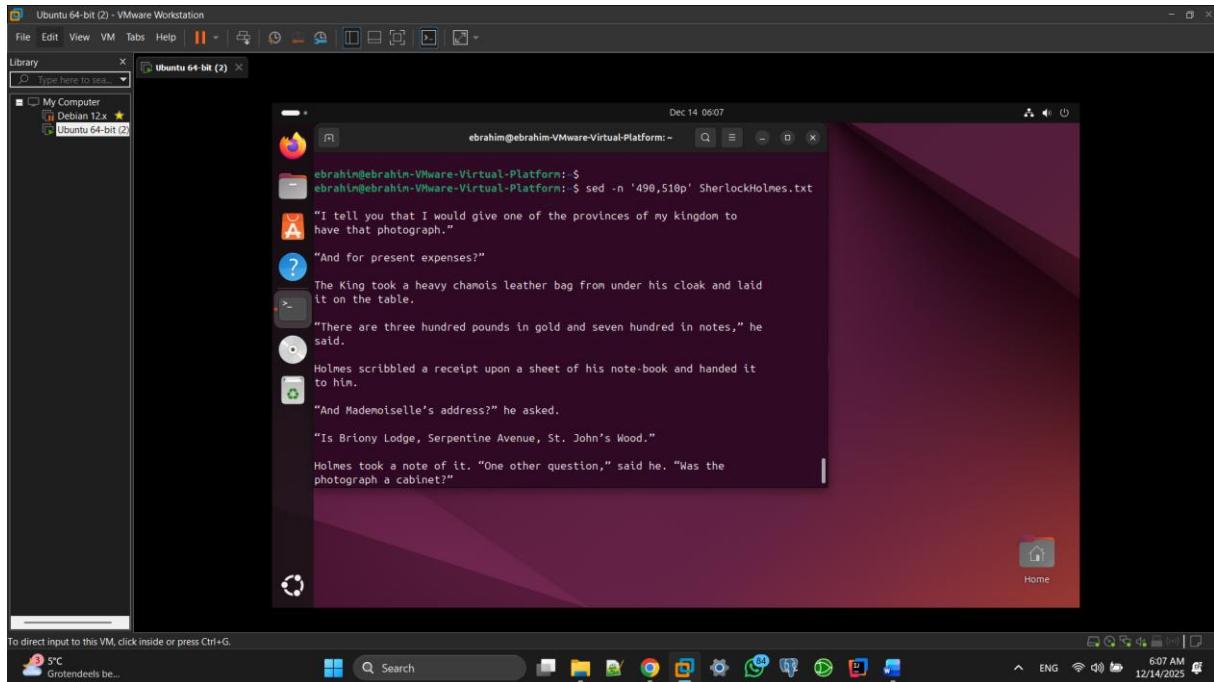
```

"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.



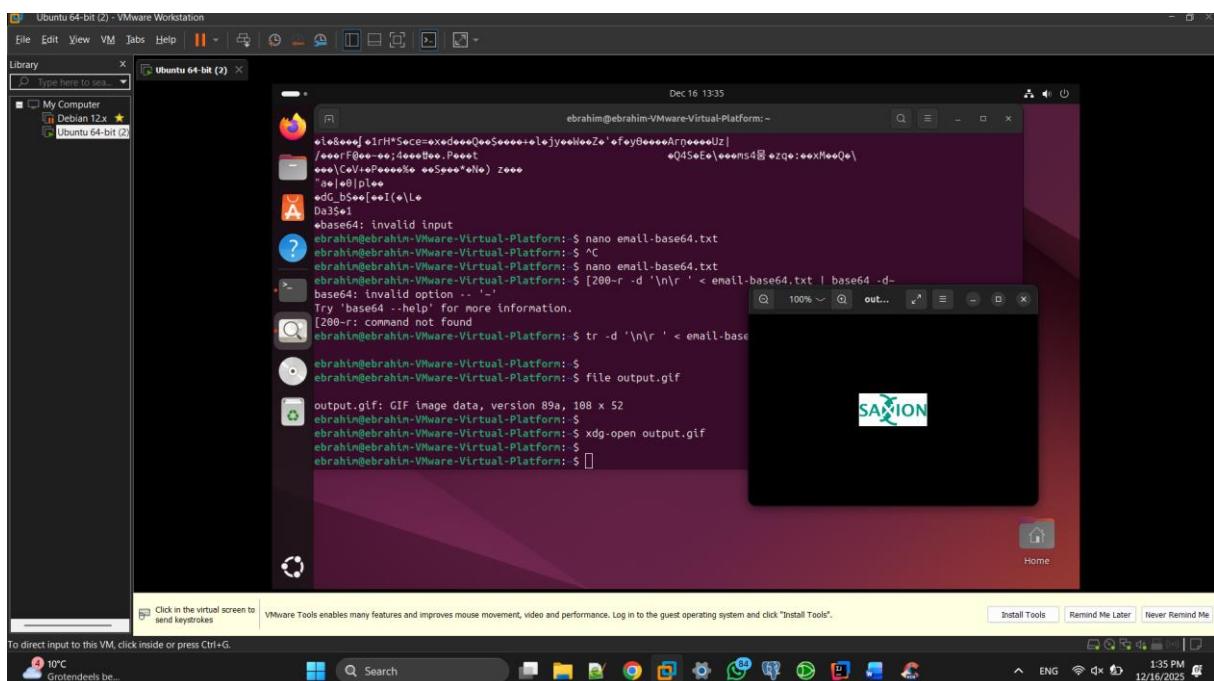
I used the wc command to count the number of lines, words, and characters in the file.

I used grep -n to find the word "kingdom" and display the line numbers.

Using text viewing commands, I displayed the lines around the word "kingdom".

## Assignment 5.7: Digital forensics

Relevant screenshots + motivation

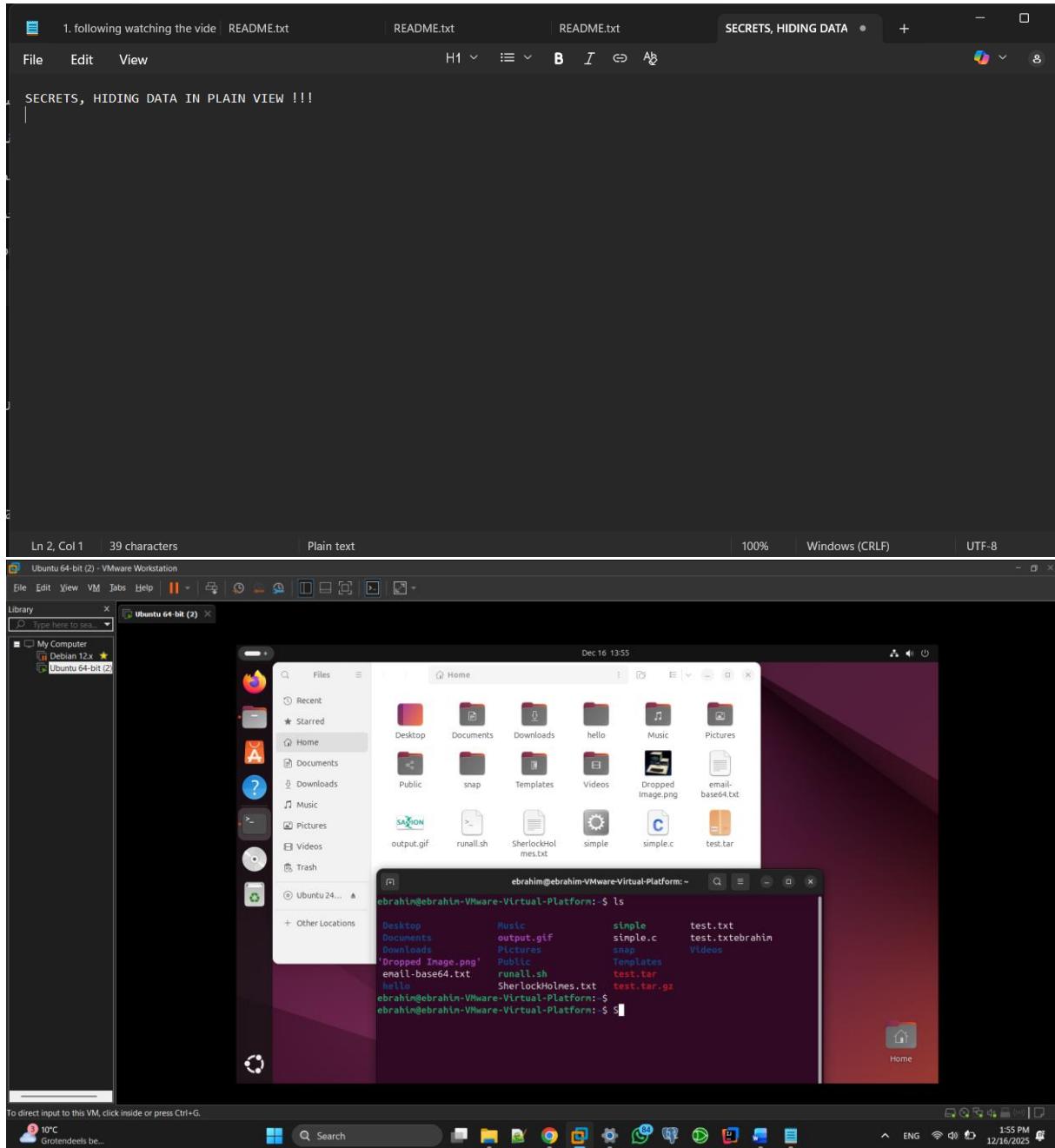


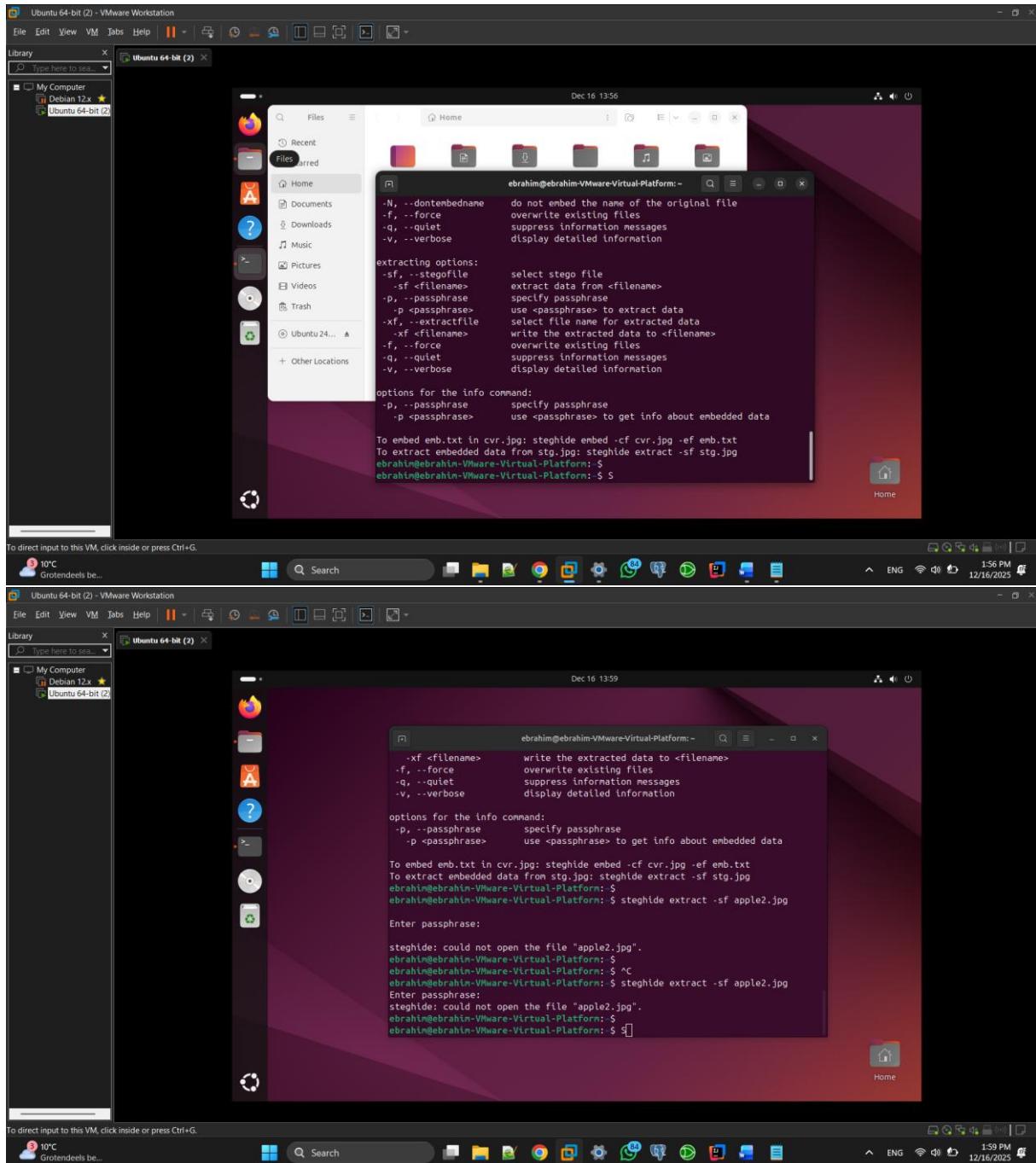
Copying the BASE64 data directly from Brightspace truncated the input.

I reconstructed the full BASE64 content manually to ensure correct decoding.

## Assignment 5.8: Steganography

Relevant screenshots + motivation



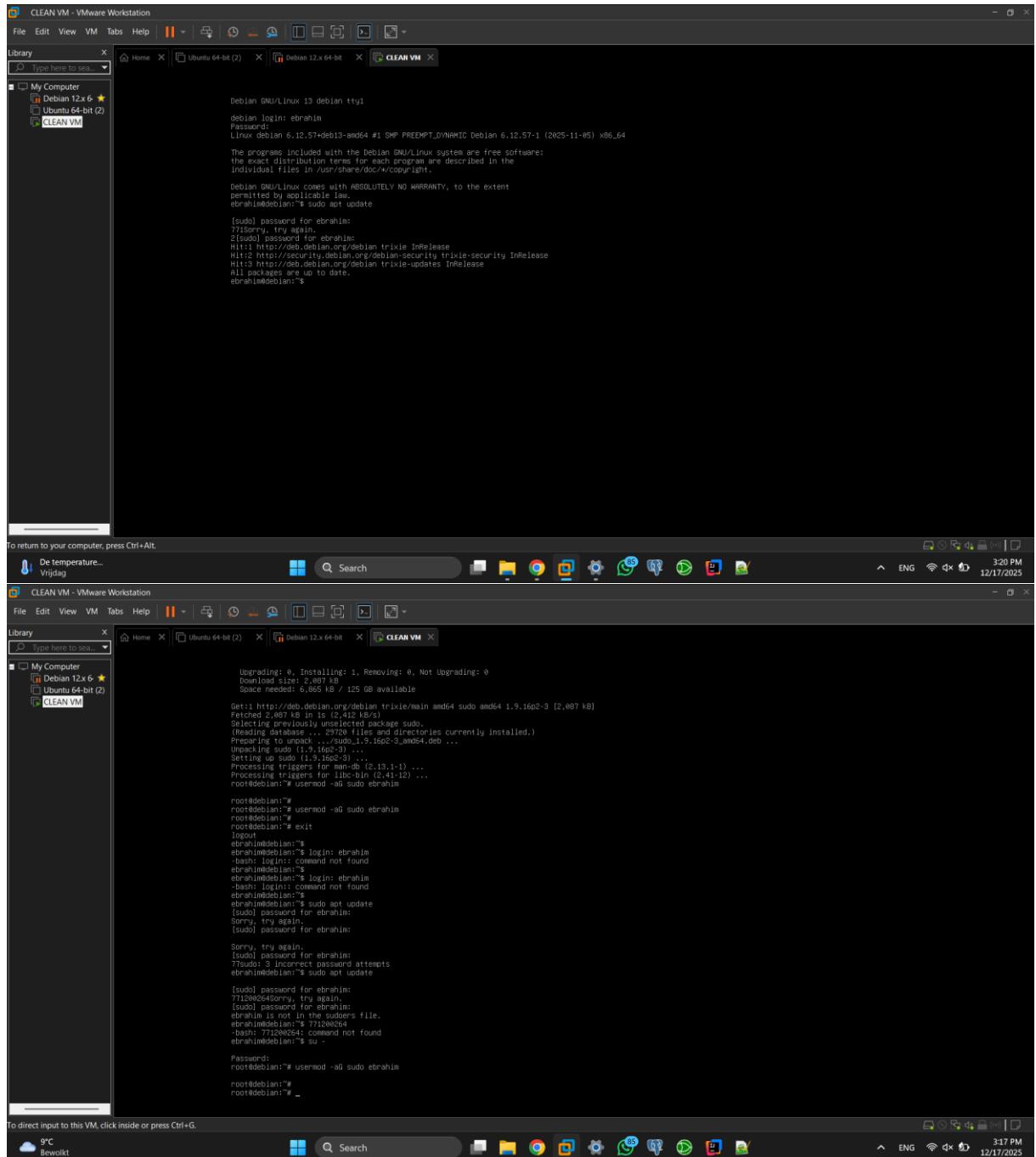


I used the steghide command-line tool to extract a hidden text file from the image. The extraction required a password, and after providing it, the hidden text file was successfully recovered and read.

### 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.



CLEAN VM - VMware Workstation

File Edit View VM Tabs Help | Home CLEAN VM

Library Type here to search

My Computer

- Debian 12x 6 ★
- Ubuntu 64-bit (2)
- CLEAN VM

```
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
ebrahim@ebrahim:~$ sudo apt update

[sudo] password for ebrahim:
[sudo] password for ebrahim:
2[sudo] password for ebrahim:
Hit:1 http://deb.debian.org/debian trixie InRelease
Hit:2 http://security.debian.org/debian-security trixie-security InRelease
Hit:3 http://security.debian.org/debian-security-trixie-updates trixie-security InRelease
All packages are up to date.
ebrahim@ebrahim:~$ sudo apt update

sudo apt install openssh-serv
sudo apt install openssh-server -y

sudo systemctl enable --now ssh

Ign1: http://deb.debian.org/debian trixie InRelease
Ign1: http://deb.debian.org/debian trixie-updates InRelease
Ign1: http://security.debian.org/debian-security trixie-security InRelease
Ign1: http://security.debian.org/debian-security-trixie-updates trixie-security InRelease
Ign2: http://deb.debian.org/debian trixie InRelease
Ign2: http://security.debian.org/debian-security trixie-security InRelease
Hit:1 http://deb.debian.org/debian trixie InRelease
Hit:2 http://security.debian.org/debian-security trixie-security InRelease
Hit:3 http://security.debian.org/debian-security-trixie-updates trixie-security InRelease
All packages are up to date.
ebrahim@ebrahim:~$ systemctl status ssh

● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-12-17 14:51:48 CET; 3min ago
     Invocation-Count: 1
      Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 871 (sshd)
      Tasks: 1 (limit: 2425)
     Memory: 2.6M (peak: 3.5M)
        CPU: 8ms
       CGroup: /system.slice/ssh.service
              └─ 871 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Warning: some journal files were not opened due to insufficient permissions.
ebrahim@ebrahim:~$
```

To direct input to this VM, click inside or press Ctrl+G.

9°C Bewolkt Search

File Edit View VM Tabs Help | CLEAN VM

Library Type here to search

My Computer

- Debian 12x 6 ★
- Ubuntu 64-bit (2)
- CLEAN VM

```
All packages are up to date.
ebrahim@ebrahim:~$ sudo apt update

sudo apt install openssh-serv
sudo apt install openssh-server -y

sudo systemctl enable --now ssh

Ign1: http://deb.debian.org/debian trixie InRelease
Ign1: http://deb.debian.org/debian trixie-updates InRelease
Ign1: http://security.debian.org/debian-security trixie-security InRelease
Ign1: http://security.debian.org/debian-security-trixie-updates trixie-security InRelease
Ign2: http://deb.debian.org/debian trixie InRelease
Ign2: http://security.debian.org/debian-security trixie-security InRelease
Hit:1 http://deb.debian.org/debian trixie InRelease
Hit:2 http://security.debian.org/debian-security trixie-security InRelease
Hit:3 http://security.debian.org/debian-security-trixie-updates trixie-security InRelease
All packages are up to date.
ebrahim@ebrahim:~$ systemctl status ssh

● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
   Active: active (running) since Wed 2025-12-17 14:51:48 CET; 3min ago
     Invocation-Count: 1
      Docs: man:sshd(8)
             man:sshd_config(5)
   Main PID: 871 (sshd)
      Tasks: 1 (limit: 2425)
     Memory: 2.6M (peak: 3.5M)
        CPU: 8ms
       CGroup: /system.slice/ssh.service
              └─ 871 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Warning: some journal files were not opened due to insufficient permissions.
ebrahim@ebrahim:~$ sudo chmod 755 /var/www/images
sudo chmod 755 /var/www/images
ebrahim@ebrahim:~$ ls -ld /var/www/images
drwxr-xr-x 2 root root 4096 Dec 17 15:24 /var/www/images
ebrahim@ebrahim:~$ sudo chmod ebrahim:ebrahim /var/www/images
ebrahim@ebrahim:~$ sudo chmod 755 /var/www/images
drwxr-xr-x 2 ebrahim ebrahim 4096 Dec 17 15:24 /var/www/images
ebrahim@ebrahim:~$ ls -ld /var/www/images
drwxr-xr-x 2 ebrahim ebrahim 4096 Dec 17 15:24 /var/www/images

ebrahim@ebrahim:~$
```

To direct input to this VM, click inside or press Ctrl+G.

9°C Bewolkt Search

```

uter
n 12x6 ★
u 64-bit (2)
VM

Hit:2 http://deb.debian.org/debian trixie-updates InRelease
All packages are up to date.
ebrahim@debian:~$ systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/usr/lib/systemd/system/ssh.service; enabled; preset: enabled)
     Active: active (running) since Wed 2025-12-17 14:51:48 CET; 3min ago
       Invocation-Id: ced3e04c40c2b01dea7b1649d35
     Docs: man:sshd(8)
           man:ssh_config(5)
      Main PID: 871 (sshd)
        Tasks: 1 (limit: 2426)
         Memory: 2.8M (peak: 3.5M)
            CPU: 0mms
          CGroup: /system.slice/sshd.service
                  └─871 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups

Warning: some journal files were not opened due to insufficient permissions.
ebrahim@debian:~$ sudo mkdir -p /srv/images
sudo: chown: USER:*
sudo: chown: USER:USER /srv/images

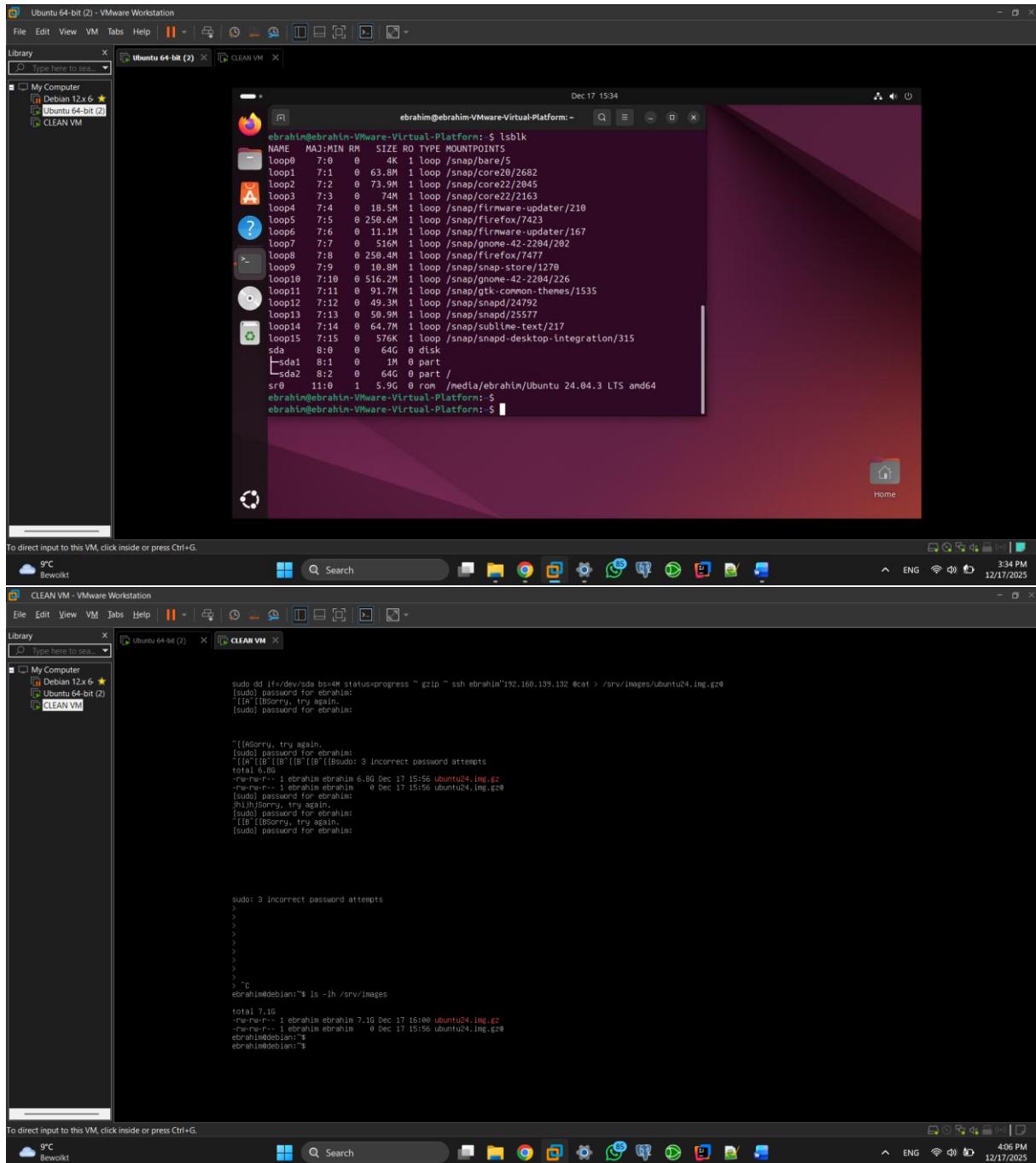
ebrahim@debian:~$ 
ebrahim@debian:~$ ls -ld /srv/images
drwxr-xr-x 2 root root 4096 Dec 17 15:24 /srv/images
ebrahim@debian:~$ 
ebrahim@debian:~$ sudo chown ebrahim:ebrahim /srv/images
-rw-r--r-- 1 ebrahim ebrahim 0 Dec 17 15:24 /srv/images

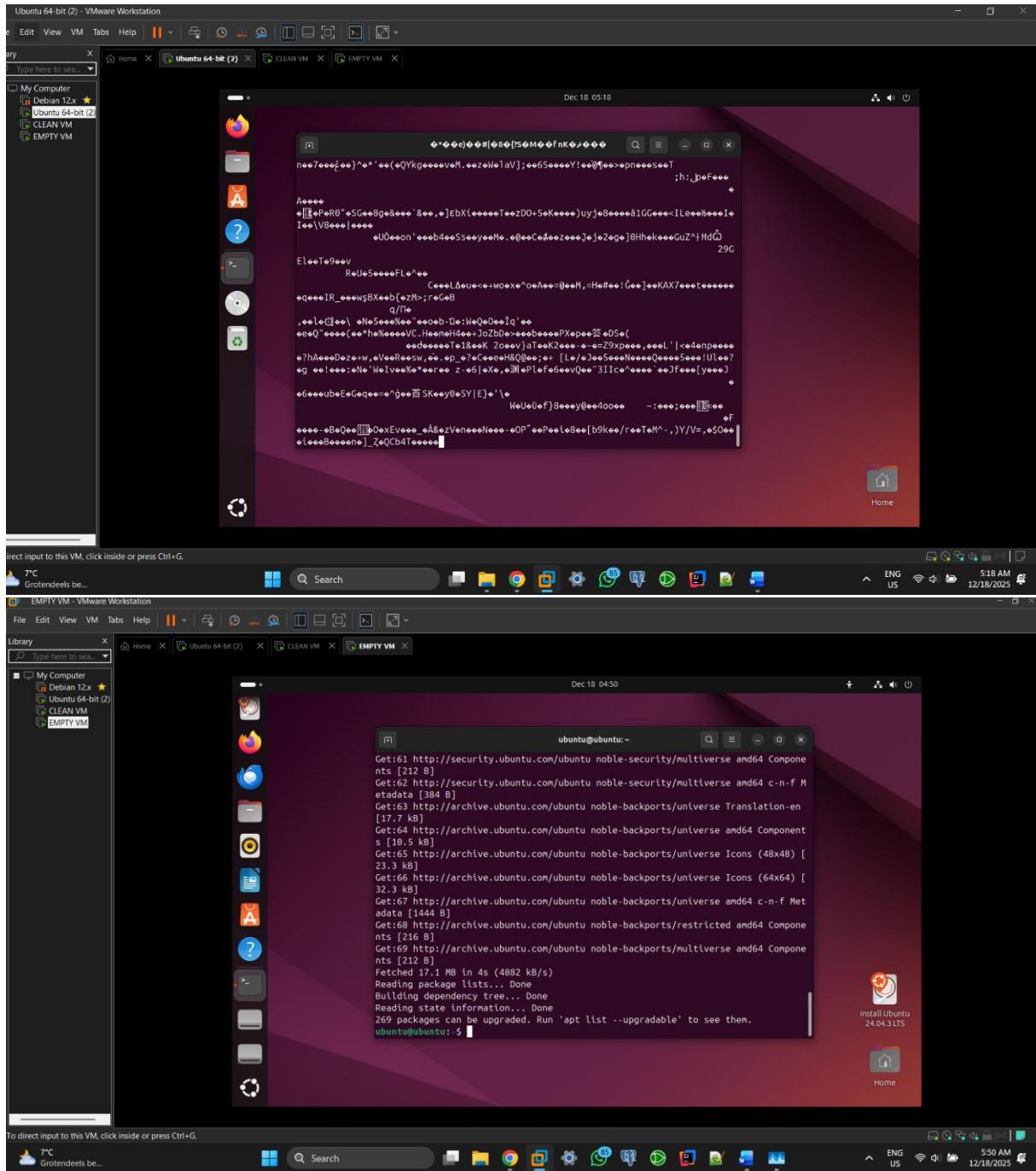
ls -ld /srv/images
ebrahim@debian:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 brd 0.0.0.0 scope host lo
        valid_lft forever preferred_lft forever
        inet6 ::1/128 brd 0.0.0.0 scope host noprefixroute
            valid_lft forever preferred_lft forever
            valid_lft forever preferred_lft forever
2: ens3: <NO-CARRIER,BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:1c:ee:f7 brd ff:ff:ff:ff:ff:ff
    altname enp2s1
    inet 192.168.139.132/24 brd 192.168.139.255 scope global dynamic noprefixroute ens3
        valid_lft 128sec preferred_lft 128sec
        inet6 fe80::20c:29ff:fe1c:eef7/64 scope link
            valid_lft forever preferred_lft forever
ebrahim@debian:~$ 
ebrahim@debian:~$ 

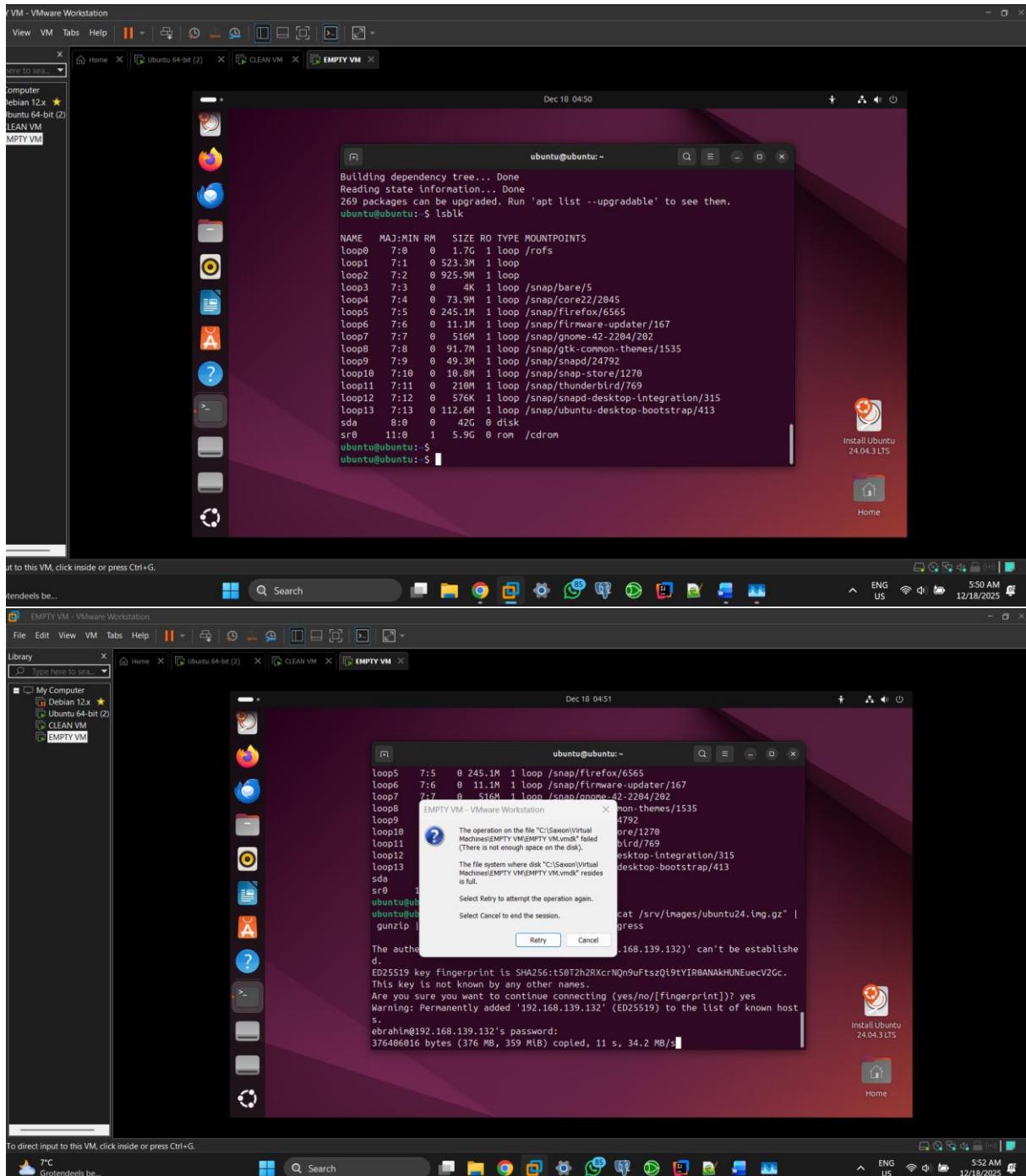
Ubuntu 64-bit (2) - VMware Workstation
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Ubuntu 64-bit (2) 
CLEAN VM 
Type here to search... 
My Computer 
Debian 12.x 6 ★ 
Ubuntu 64-bit (2) 
CLEAN VM 
ebrahim@ebrahim-VMware-Virtual-Platform:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 brd 0.0.0.0 scope host lo
        valid_lft forever preferred_lft forever
        inet6 ::1/128 brd 0.0.0.0 scope host noprefixroute
            valid_lft forever preferred_lft forever
            valid_lft forever preferred_lft forever
2: ens3: <NO-CARRIER,BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default
    link/ether 00:0c:29:1c:ee:f7 brd ff:ff:ff:ff:ff:ff
    altname enp2s1
    inet 192.168.139.132/24 brd 192.168.139.255 scope global dynamic noprefixroute
        valid_lft 1640sec preferred_lft 1640sec
        inet6 fe80::20c:29ff:fe1c:eef7/64 scope link
            valid_lft forever preferred_lft forever
ebrahim@ebrahim-VMware-Virtual-Platform:~$ 
ebrahim@ebrahim-VMware-Virtual-Platform:~$ 

To direct input to this VM, click inside or press Ctrl+G.
9°C 
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12/17/2025 

```







The restore process was executed correctly and started copying data to the EMPTY VM disk.

The operation stopped because there was insufficient disk space on the host system, as shown in the error message.

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