

Template Week 5 – Operating Systems

Student number: 585902

Assignment 5.1: Unix-like

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

a Unix system must be licenced under Unix trademark which has its unique distinctions. On the other hand, although Unix-like systems behave and appear similar to Unix (for example having the same design principles like POSIX) they lack that trademark and certification to be 100% identical. They just implement the same concepts differently.

- 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 was the co-creator of UNIX as he designed the philosophical back bone of it as well as writing the first version of its kernel. He also created the B language which is the direct ancestor of the C language. Today's Operating systems owe him since he defined those principles and structures
 - Dennis Ritchie was the creator of the C language which is used to this day. Without that, windows itself might have not formed the way it is now. In addition to that, he not only was another one of the UNIX co developers but also rewrote it in C using assembly. In other words, UNIX became portable thanks to this man
 - Bill Joy led the development of UNIX and created C shell and vi as well as introducing TCP/IP into the project. He was a vital figure in the creation of the BSD version of UNIX. BSD then became the basis for many unix-like systems like macOS, FreeBSD and openBSD. In 1970 and 80's he laid the foundation of the internet. With the network infrastructure he designed such as NFS (network file system) protocol he made the biggest contribution to the scalability of UNIX, making it a networked OS. He also had a substantial role in development of the Java
 - Richard Stallman founded the GNU project and created its core utilities like its GCC compiler. The project was originally aimed to be a free UNIX-Like OS. Under the terms of GPL (general public license) which he authored he defined the software freedom as a concept, making the collaborative open development legally possible. Without his inventions linux would have stayed a kernel
 - Linus Torvald is the inventor of linux kernel and the earliest version of git. Although Richard Stallman had laid the foundation of the software freedom before him, he established the modern adaptation we see today with Linux being open source as an example. Linux quickly became worldwide in servers and supercomputers
- c) What is the philosophy of the GNU movement? GNU movement is about software freedom that implies the being able to run, study, alter and redistribute software as a user. It focusses on user control rather than software explicitness in applying restrictions. Thus, the mindset behind that is creating an OS that's completely made of free components

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

To some extent. Although its backbone comes from GNU and later on Lunix, and although it offers a variety of free features, but it allows and sometimes comes with proprietary drivers and firmware to enhance usability

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

Windows Subsystem for Linux is a compatibility layer that allows **Linux binaries to run natively on Windows** without a traditional virtual machine. It enables developers to use Linux tools, shells, and distributions directly within Windows while sharing the same system resources

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

Android: Unix-Like

iOS: Unix (BSD-based) but at the same time its also categorized as unix-like as well which makes it a special case

ChromeOS: Linux (Unix-like) because it's based on the Unix 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, specially very powerful computers are created to do tasks very large or computationally constraining that plain machines cannot do efficiently. They have been used throughout computing history to manage complicated scientific, engineering and mathematical tasks specially the ones that have substantial data and a high number of numerical computations. Initially, supercomputers were used in scientific research and military applications such as weather prediction, simulation of nuclear weapons, real-time processing of satellite images. With the improvement of technology their use got broadened to tasks like molecular simulations and large-scale data analysis; therefore they are now useful in more fields, still maintaining their initial use on the side. These machines allow researchers to study huge volumes of data, simulate complex systems and explore how things can be computed faster than ever before and often reach speeds measured in the petaflops or exaflops (quadrillions or quintillions of floating-point operations per second).

- 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 low-cost computing cluster built by connecting many PlayStation 3 consoles together and using their Cell Broadband Engine CPUs, which were derived from the processor architecture used in IBM Roadrunner. By running Linux on the PS3, researchers were able to use the consoles as computing nodes in parallel computing environments. These clusters were mainly used for scientific research and experimentation, such as physics simulations, cryptography research and signal processing. The primary motivation was being cost efficient since PS3 consoles offered powerful vector-processing capabilities at a fraction of the cost of traditional supercomputing hardware. Institutions such as universities and research labs used PS3 clusters to explore parallel programming techniques and perform computational tasks that benefited from the Cell processor's architecture. PS3 clusters were finally phased out because they had limited memory and because of the lack of double-precision performance, and although Sony later removed their Linux support, they played an important role in showing how consumer hardware could be repurposed for scientific computing.

- 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 built the Raspberry Pi cluster using **Oracle Linux**, which is a **Linux (Unix-like) operating system** optimized for enterprise and cloud environments. Using Oracle Linux allowed the cluster to behave like a small scale data center, supporting containerization, networking, and distributed workloads across a number of **Raspberry Pi** nodes.

- 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; because the top entities today are super massive with thousands of highly optimized CPUs and accelerators that perform many times better than a Raspberry Pi cluster.

That ranking system ranks by high performance benchmarks and measures them in petaflops or exaflops. As shown in an ARM cluster, a cluster of 1050 Raspberry Pi boards could be a lot to go by, but each Raspberry Pi node has relatively low computing power. meanwhile, the overall performance on even a combined cluster would be very small compared to the systems which are a part of that top 500 list. The systems that run at petaflop/exaflop scales, being trillions to quintillions of floating point operations per second; all while a Raspberry Pi cluster would be many times slower. Hence, such a cluster would not qualify to compete considering the performance thresholds of the top 500 list.

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

Both use the same: AMD x86-64 based on Zen 2 microarchitecture

What operating systems run on these consoles?

PS5: a custom OS based on FreeBSD and it's a Unix-Like one

Xbox: a custom Microsoft OS based on Windows / NT kernel which shares technology with windows

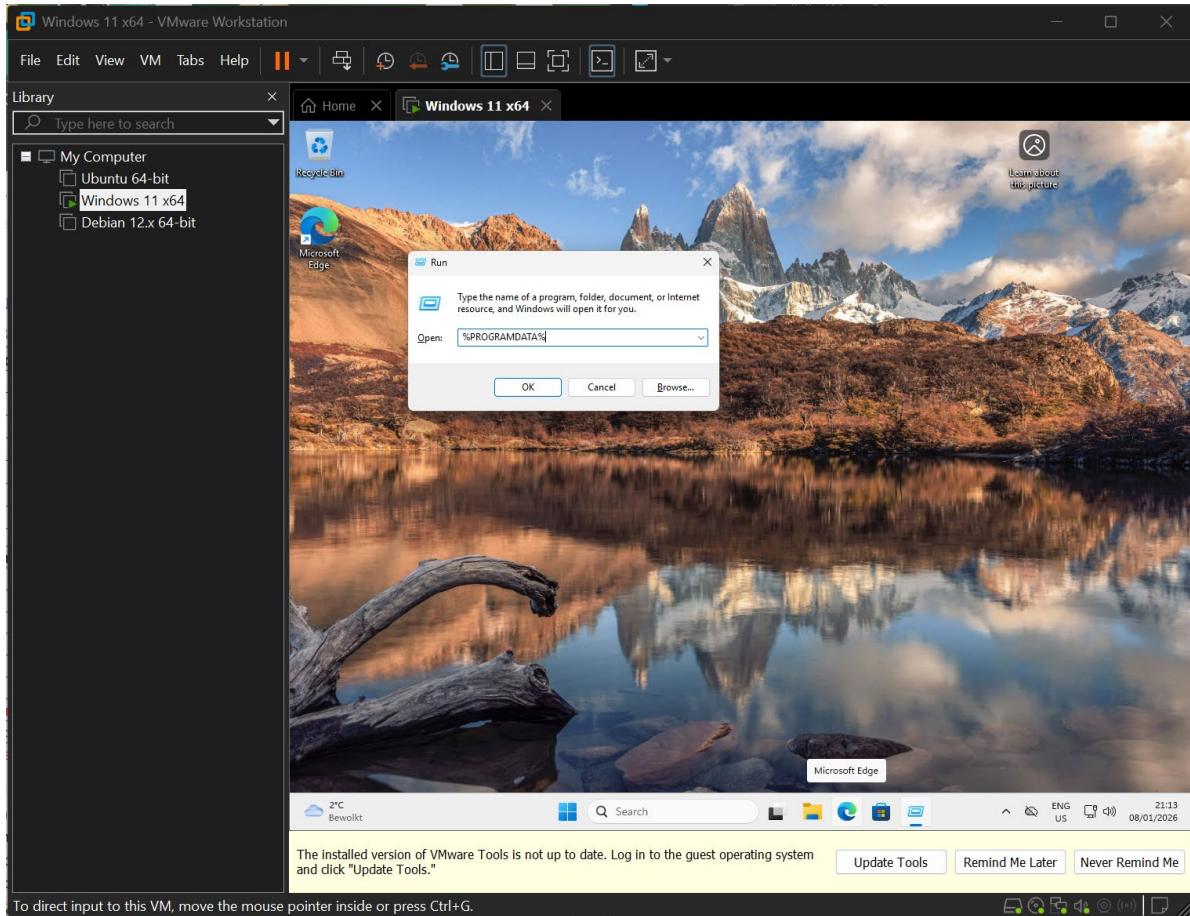
What conclusion can you draw from the answer to the previous question?

Although its normal for CPUs to be distinct from one another in the instruction set, they need to operate, which has resulted in the development of different operating systems and different approaches per hardware, but those two systems have a common CPU architect that matches with two different operating systems. This tells that modern consoles are architecturally very similar to PCs, being mainly different in their OS and optimization strategies rather than being totally different in the hardware design

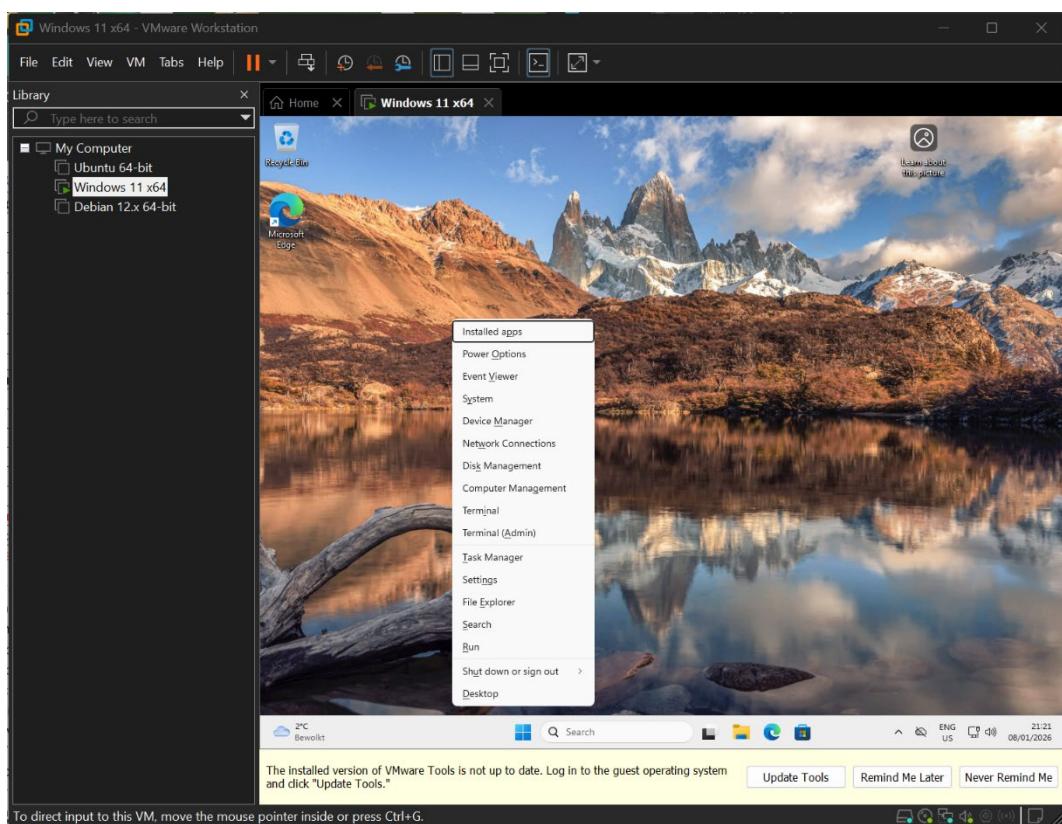
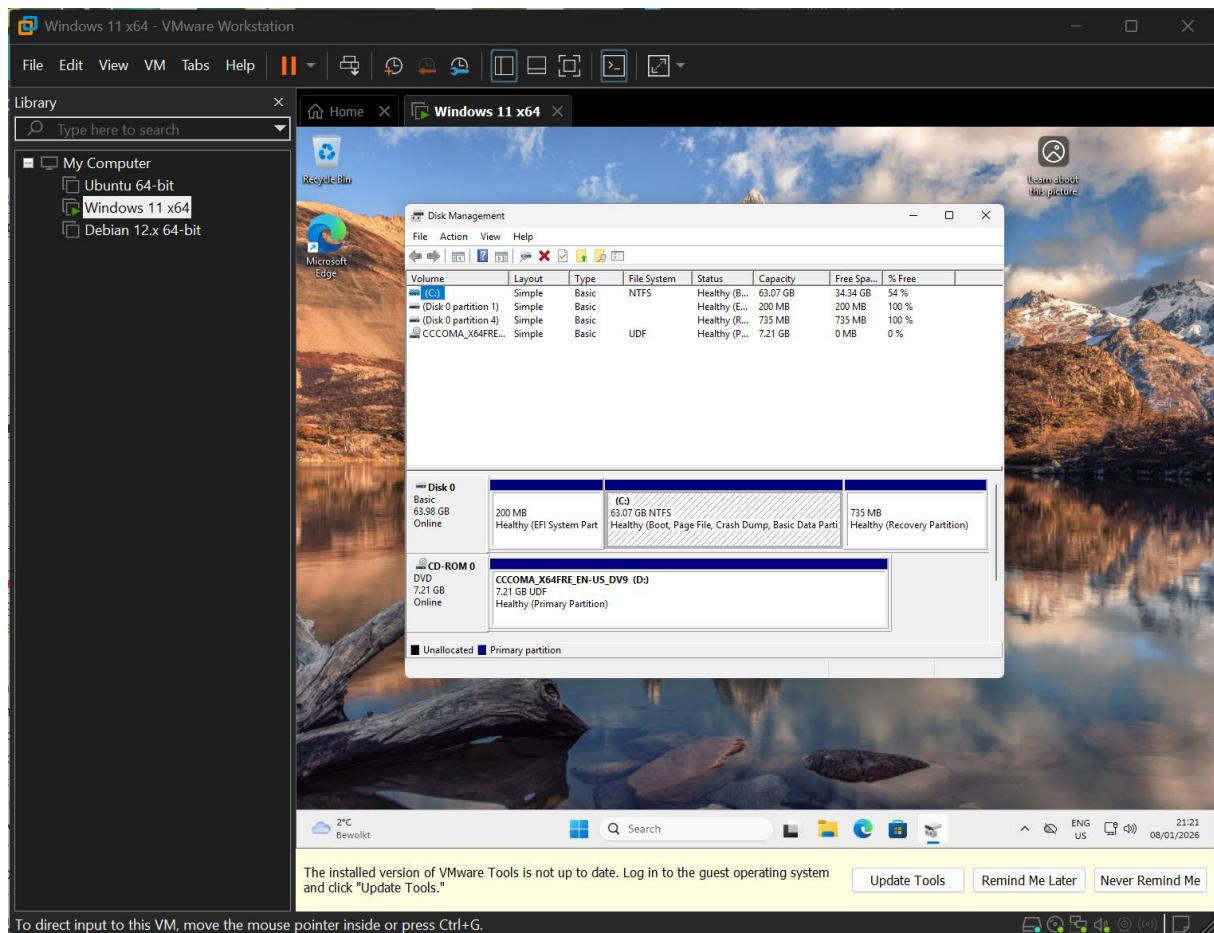
Assignment 5.3: Working with Windows

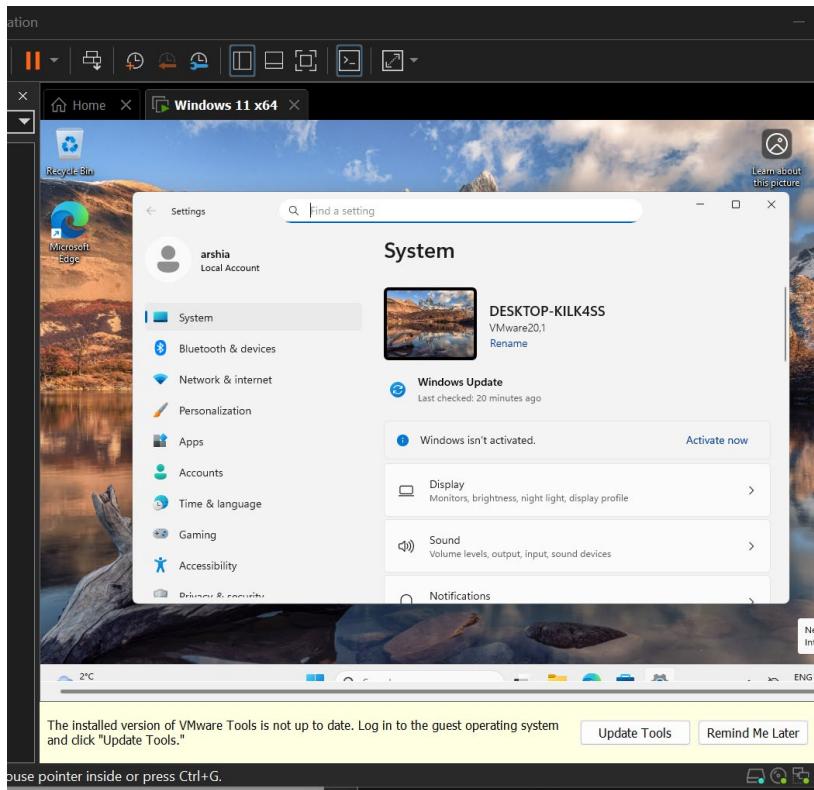
Take relevant screenshots of the assignments below

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



- Windows+R : run window is one of the most important windows that I frequently work with. When opened then I can type %PROGRAMDATA% which is usually a system hidden directory. Or perhaps type in regedit to open the registry key editor which is a crucial and advanced part of dealing with various programs
- Windows+X: opens the power user menu which is another super important one since from there I can navigate to some of the most vital sections such as Disk Manager which directly modifies the hard disks. Or perhaps Device Manager which directs me to the place where I can see every resource that my system is using
- Windows+I: this one helps a lot with navigation because often it occurs that I need to adjust something quickly in the settings but having to go to the start menu to access that will add an unnecessary hassle. Having the settings pinned in the taskbar will also waste the space that could go to other third-party applications

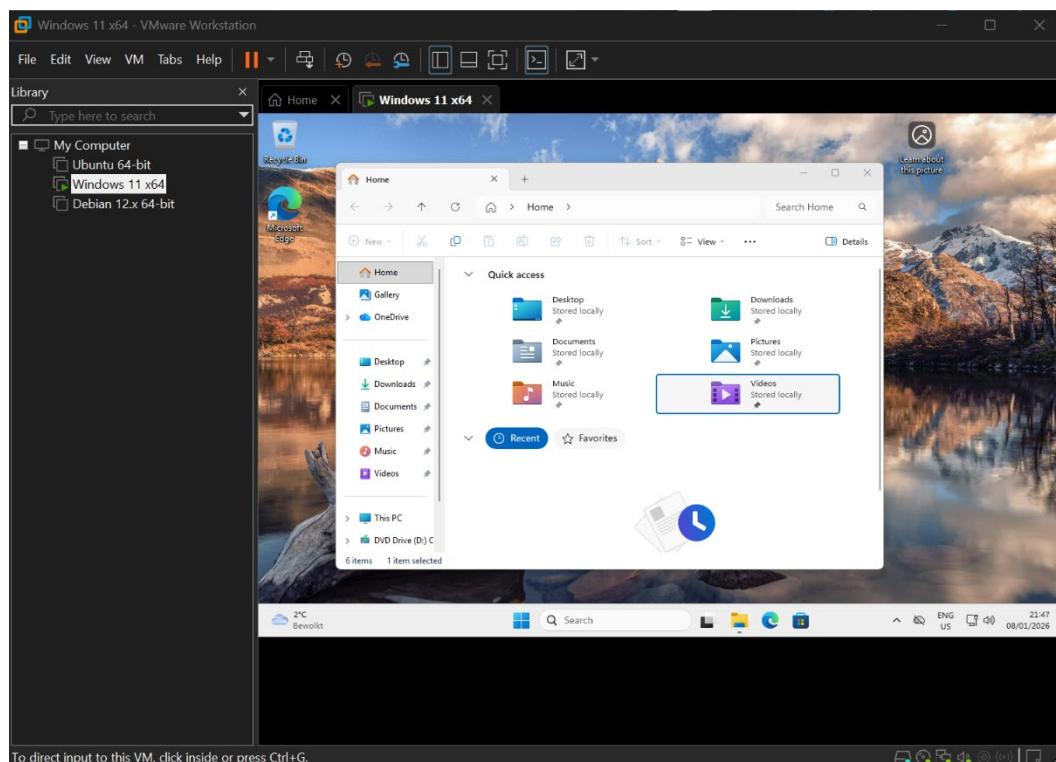




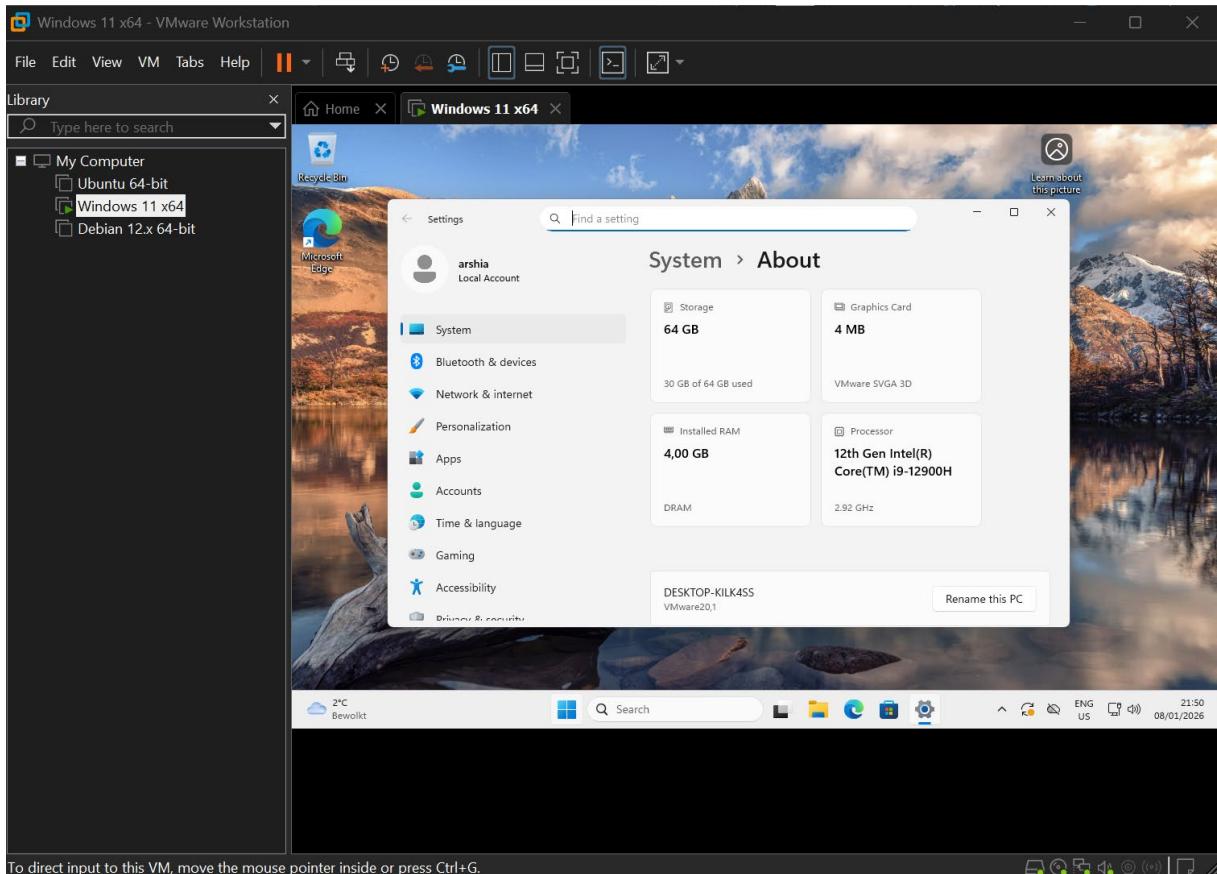
b) The file explorer can be opened with **Shift + E**, Which key combination could you also use?

There isn't any direct alternative but these ways also work :

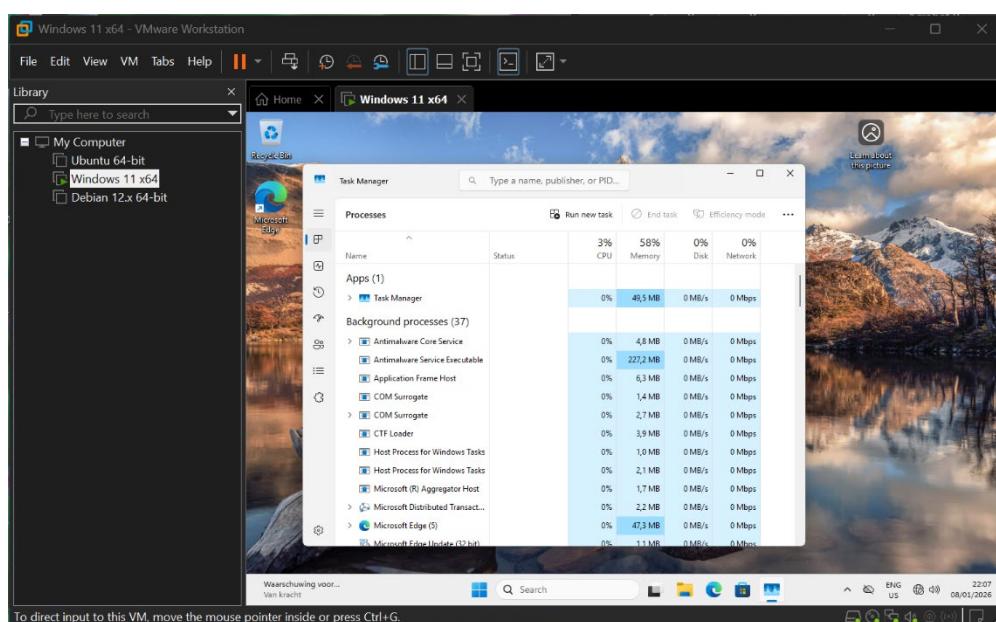
- Win + R then typing in explorer
- Ctrl + N : opens another instance of the file explorer, provided that there is already an opened instance
- Win + S brings the search bar where I can type in explorer

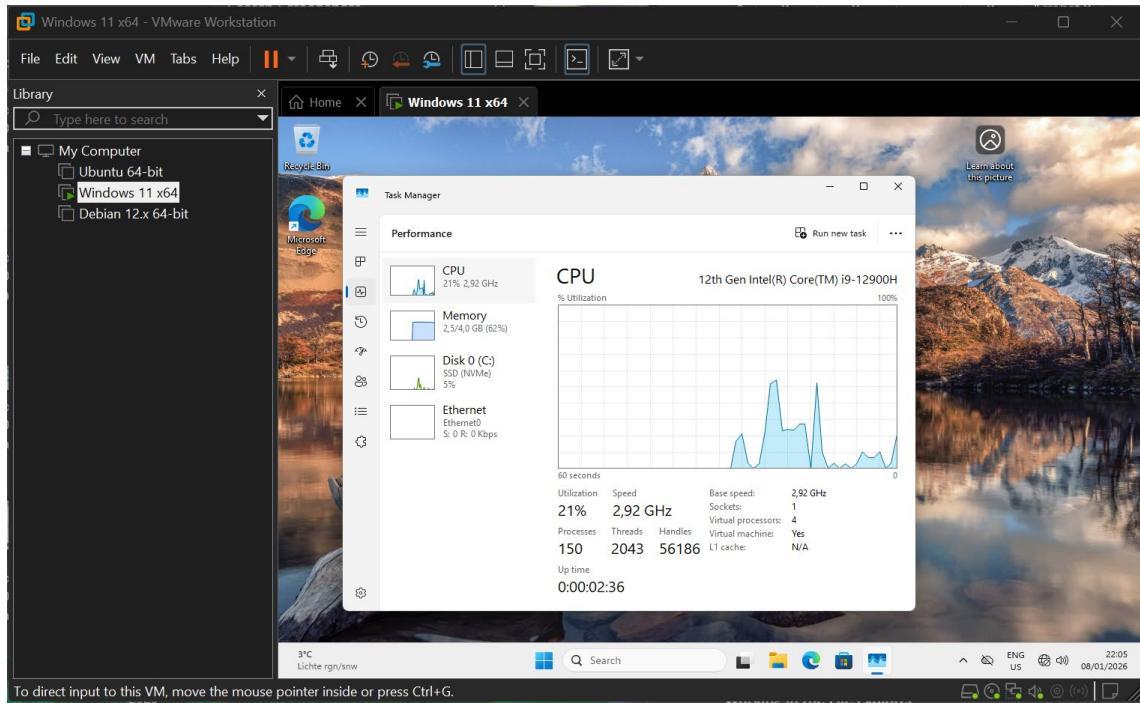


- c) Open the system properties with a **Windows + pause/break** key combination, take a screenshot of the open screen. Paste this screenshot into this template.
 Its : windows + pause/break

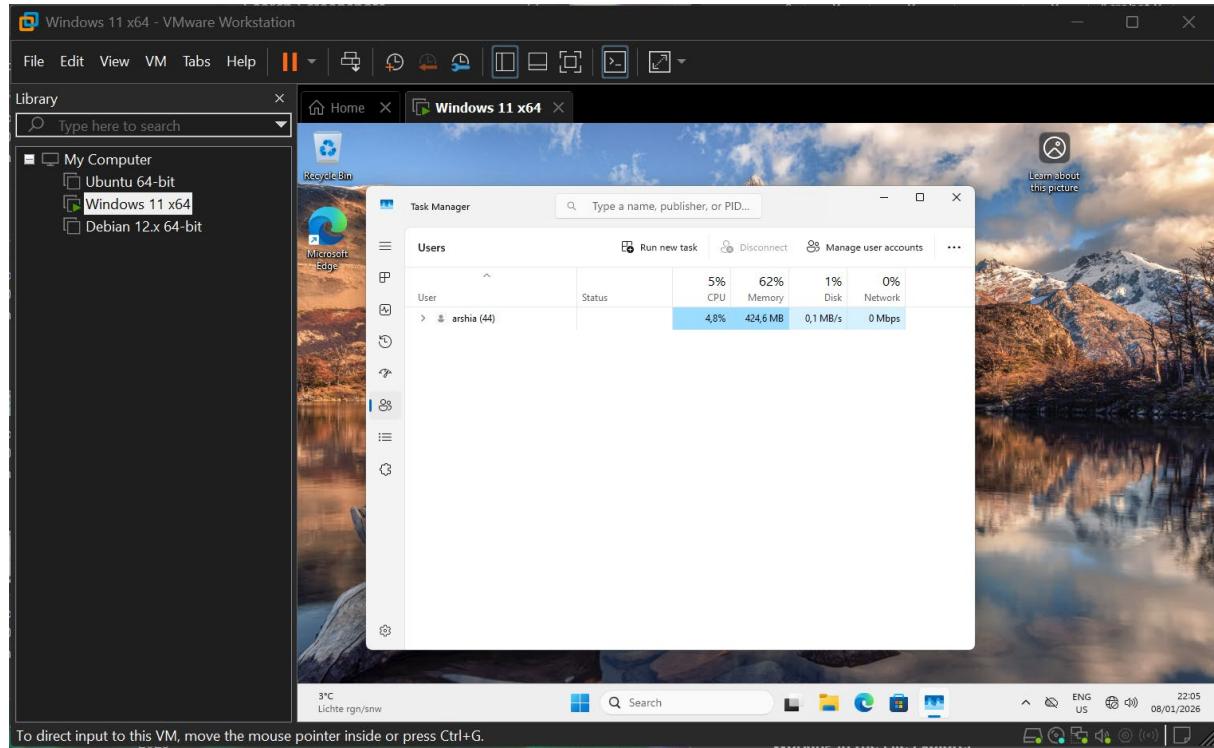


- d) Open task manager with a key combination. Take screenshots of the tabs: processes (shows active processes), performance, and users. Place these three screenshots in this template.





To direct input to this VM, move the mouse pointer inside or press Ctrl+G.



- 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 + P : this opens the project menu and in there i can choose display modes such as:

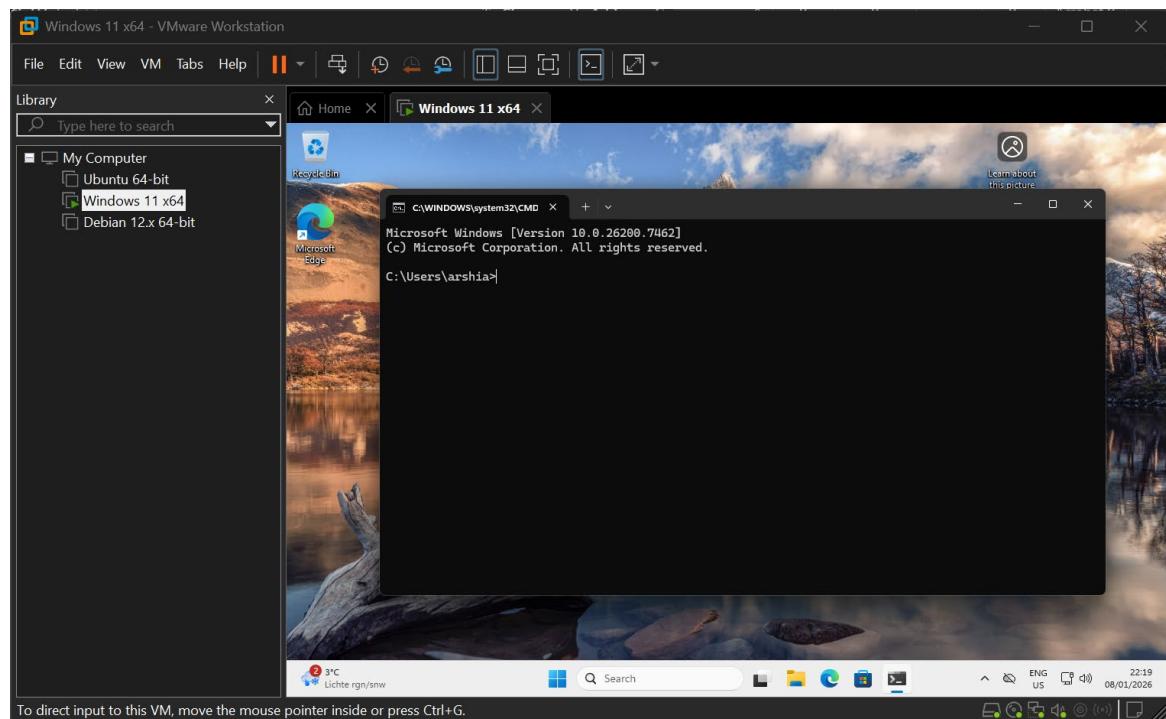
- Duplicate (which is exactly opposite to what i want because it shows exatly wahts on the screen to the second screen)
- Second screen only (which isnt ideal either)
- Extend : does exactly what im looking for

- 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 (otherwise windows doesn't normally keep the tasks such as download actively running when it goes to power saving)

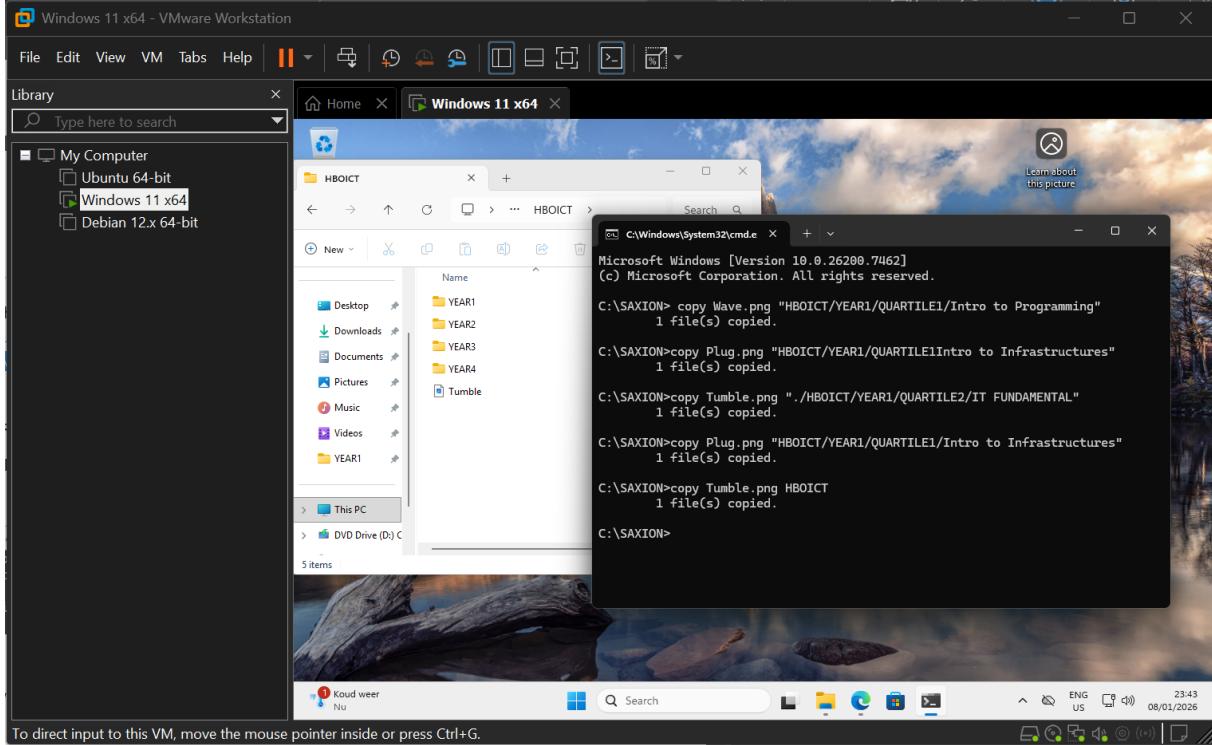
- g) Open the Run screen with a key combination. On this screen, type CMD and press <enter>. Take a screenshot of this result and paste it into this template.

It opens command prompt



Working in the File Explorer

Relevant screenshots **copy** command:



In this example I deliberately showed different instances of relative path implementation

Since I'm already in the SAXION folder (using CMD in the address bar), and none of those operations go further back than that in the hierarchy, then I wouldn't have to include the source path. However, this copy command normally needs two arguments. So, for example, if I hadn't gone into that directory and I were to execute the first line using an absolute path, it would have been like:

Copy Wave.png C:\SAXION\HBOICT "C:\SAXION\HBOICT\YEAR1\QUARTILE1\Intro to Programming"

Where I am identifying both the address to get to the mentioned file, as well as the destination to which copy it

Note that for the second part I put it in double quotes which is because when it comes to paths, windows don't like spaces unless the entire address is in the quote, something that wasn't necessary for the first address

If I'd not already gone to the SAXION folder, then I could have cd'ied to that saying so:

Cd C:\SAXION

and carry on from there

if instead of the SAXION folder I was working with a folder within home I could have shortened the home address to ~

when you already get to a folder you can just call the name of the contents that exist within that folder, without having to use an absolute path

therefore, when I want to get to the folder HBOICT which is in the SAXION folder, although the absolute path will still work but it will be an extra hassle. Therefore, provided that I'm already inside the SAXION folder, instead of writing:

copy Tumble.png C:\HBOICT I can write it either like:

copy Tumble.png HBOICT or

copy Tumble.png./HBOICT

since one dot means the same folder and double dots mean going up the path by one

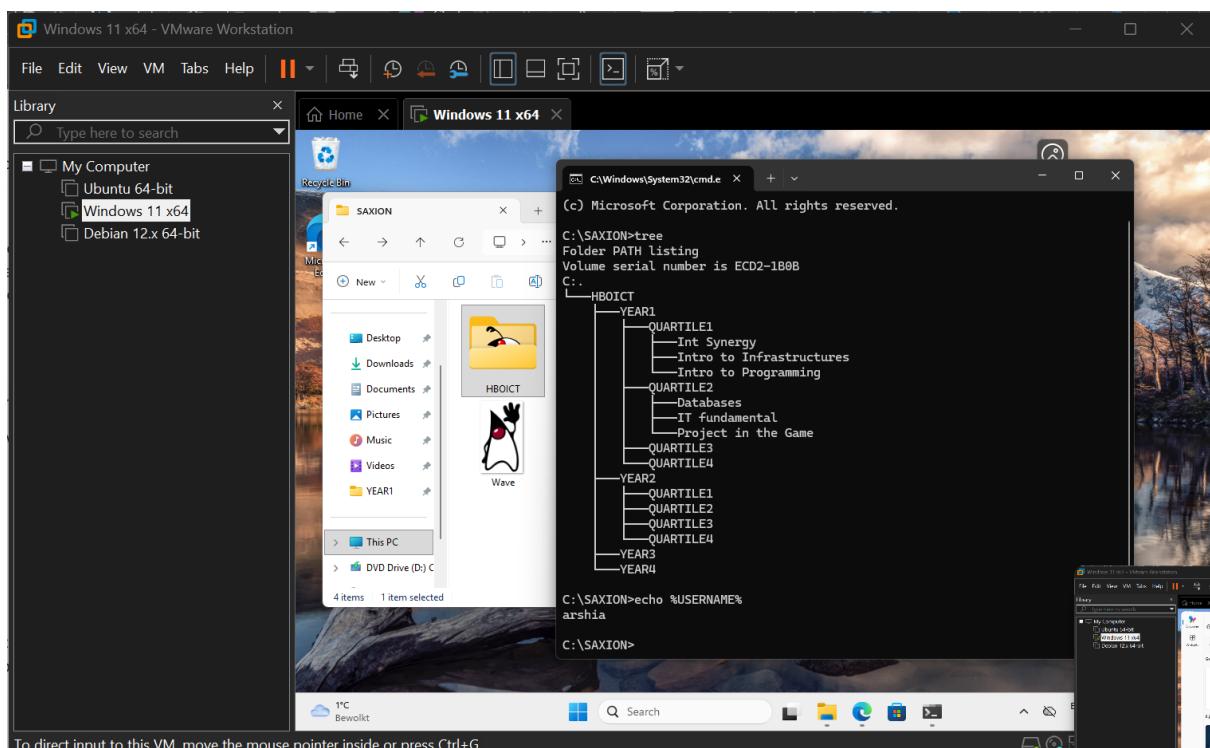
so, if for example there was a png file in the HBOICT called example.png and I wanted to copy it to the SAXION folder I could have said:

copy example.png ..

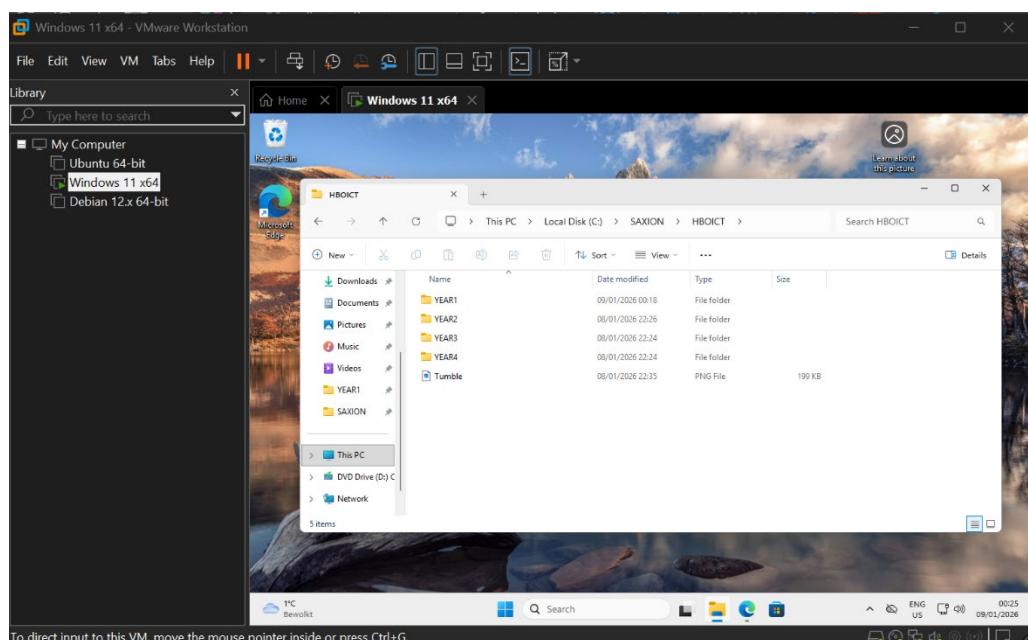
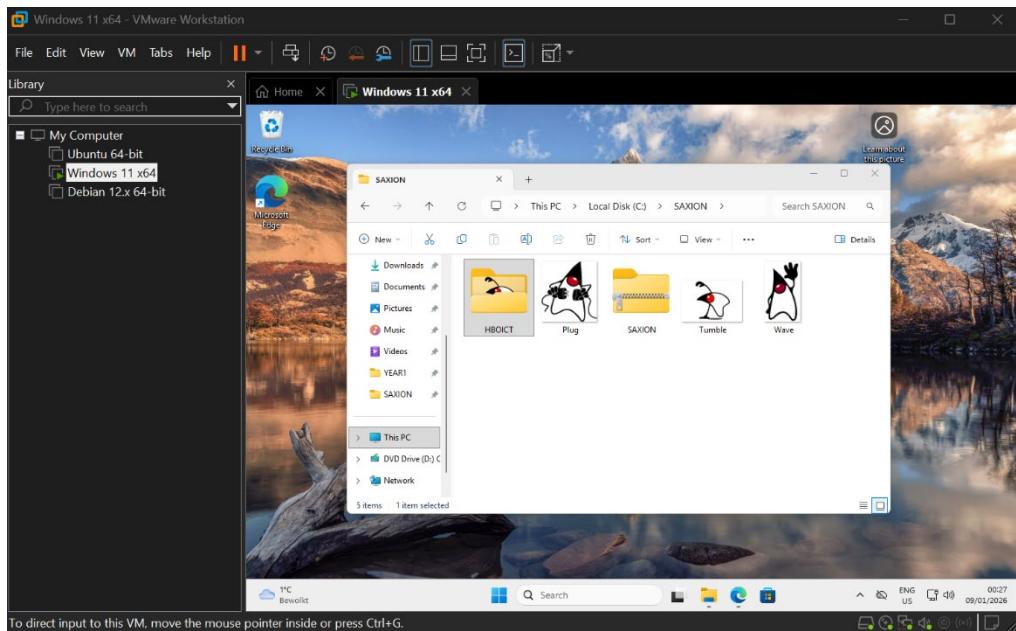
and I could have extended upon that 'moving up a step' command if I wanted to go even further up (back) in the path; so, I could have said copy example.png ..\..\..

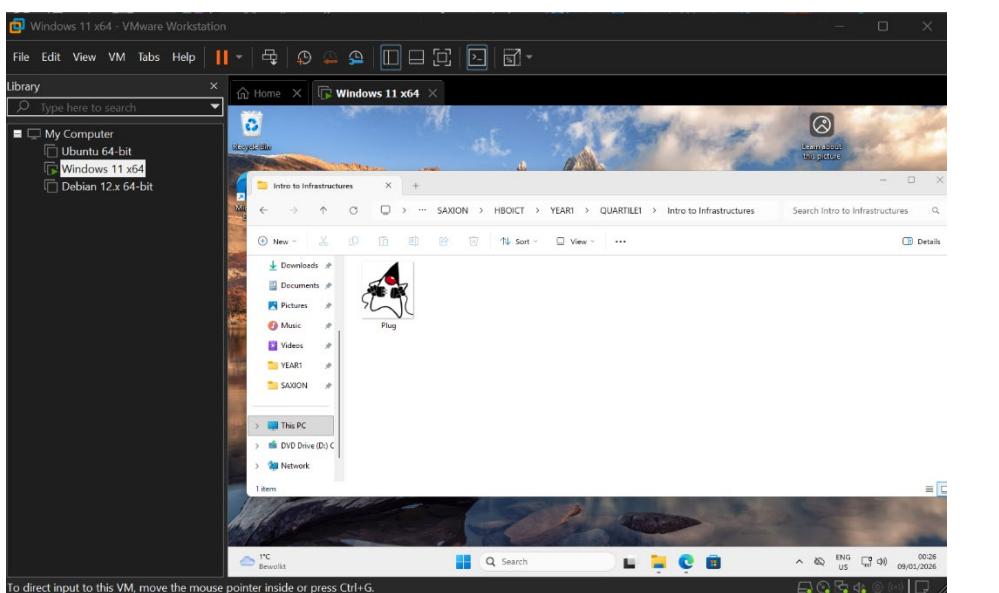
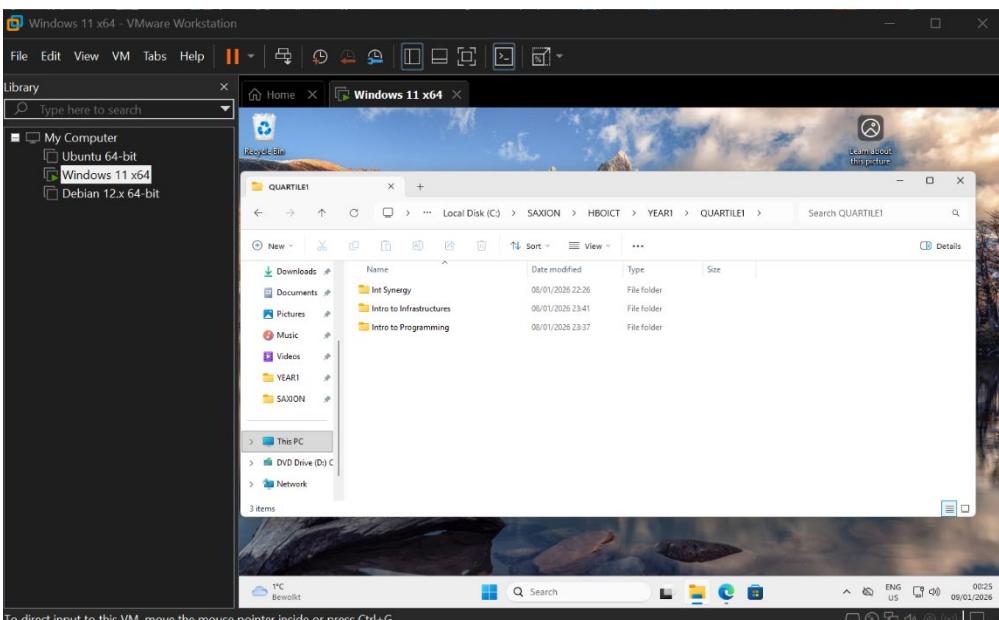
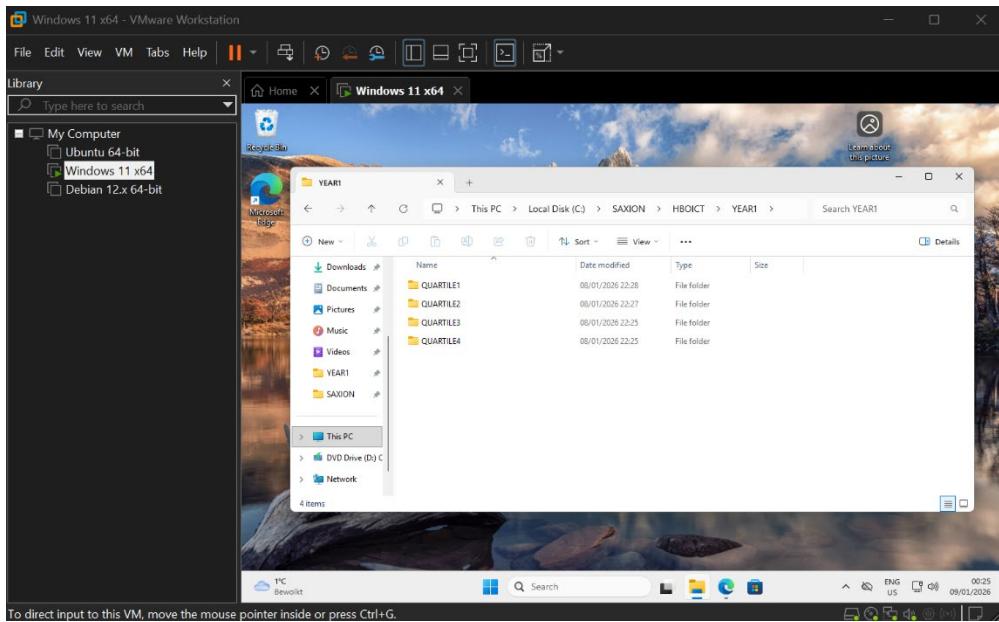
However, after all this the thing I don't understand is that why the command prompt didn't give me an error earlier when I was putting forward slashes instead of back slashes for a windows environment; since windows generally work with back slash as opposed to Linux that work with forward slash

Relevant screenshots tree command:



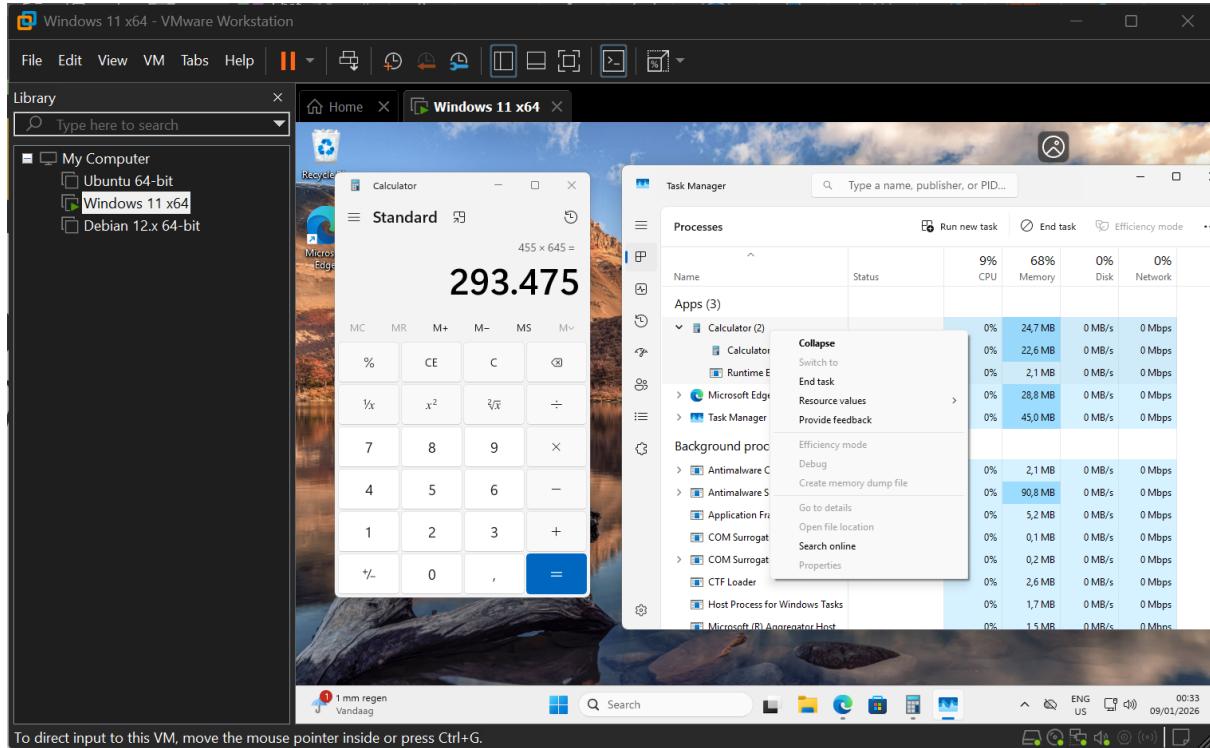
Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.





Terminating Processes

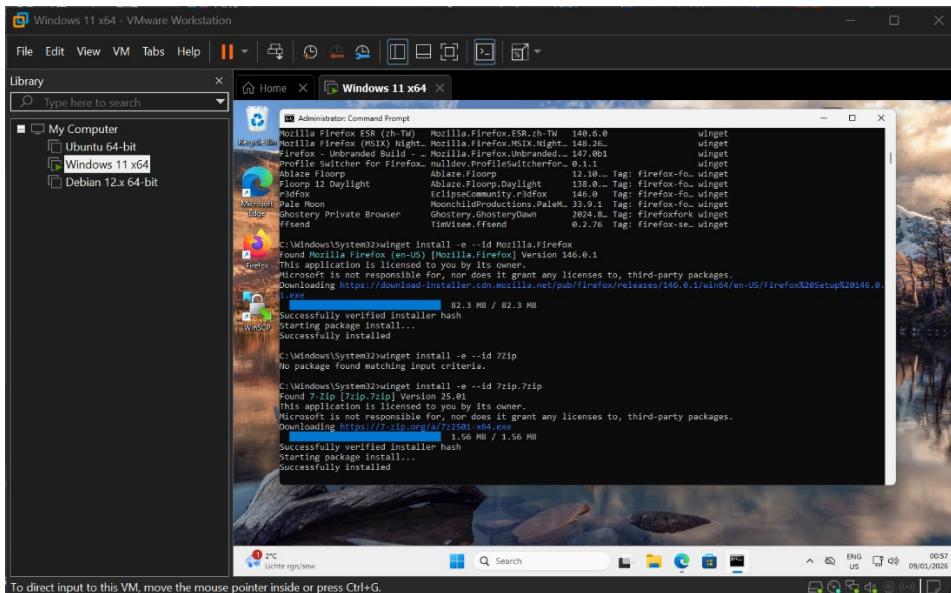
Relevant Screenshots Task Manager Window:



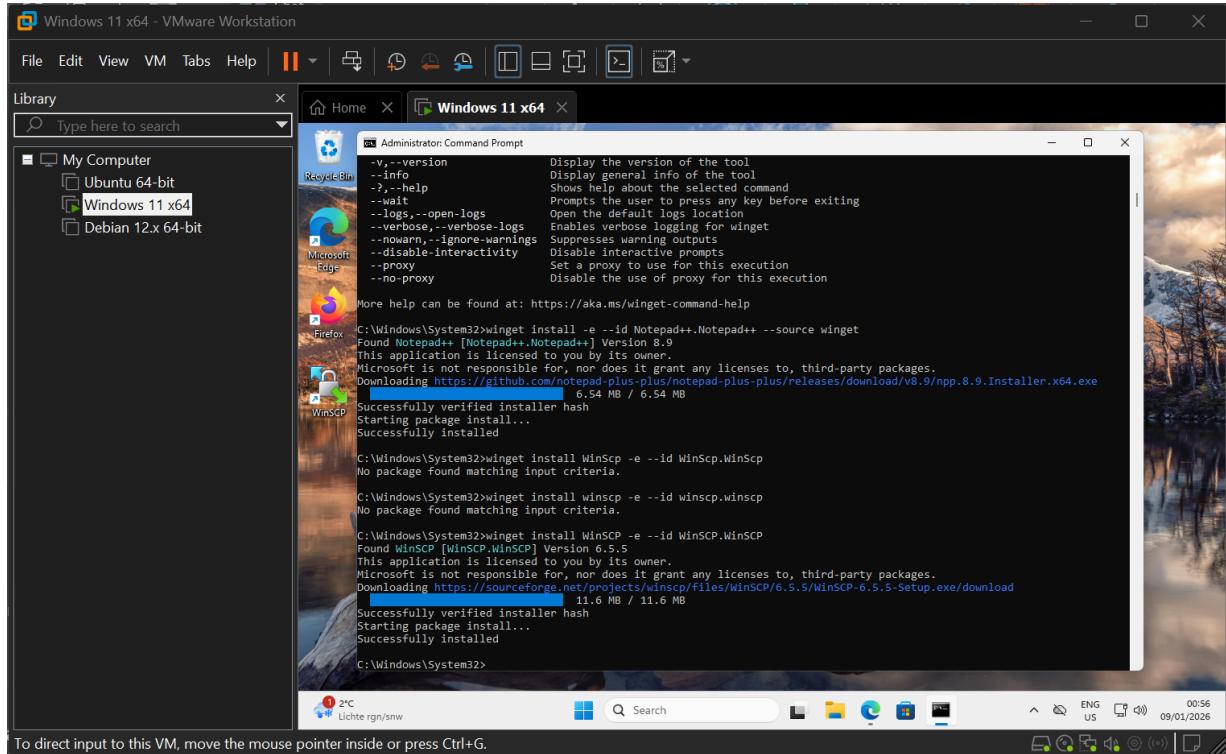
Install Software

Relevant screenshots that the following software is installed with winget:

- WinSCP
- Notepad++
- 7zip



For the WinSCP and Notepad++

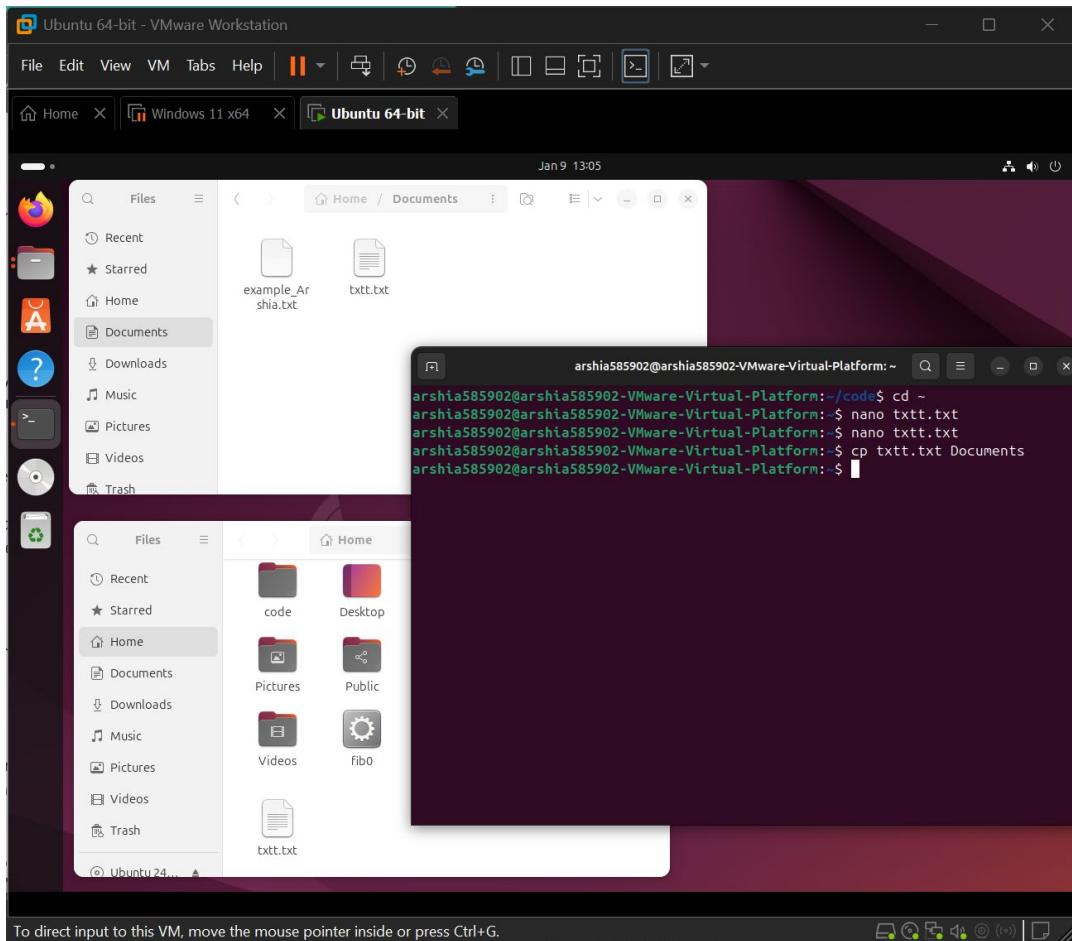


Explanation of the command :

Winget is a windows package manager. That command tells it to look for a package, download and install it. By default it looks into its official package directories such as microsoft store, winget community respository and winget-font. (although its possible to customize the locations in which it looks up). As a result, the user doesn't have to manually search and download the installer. However in order for it to successfully accomplish the installation it should know which package user means and that's where those options come in. As part of its instruction, winget identifies the available installation packages by their unique identifier or otherwise '--id'. If two packages have a similar name it chooses the one that exactly matches the provided id and that's where the -e option comes in (short term for exact).

Assignment 5.4: Working with Linux

1. Relevant screenshots + motivation



2.

- To navigate back to the home directory from the 'etc' folder one way is to just say : cd ~ since the symbol ~ stands for the home directory. Another way is to go up (back) by one using .. and then go down again this time to the home directory so the command from etc to home would be: cd ../home
- One significant difference between windows and linux is that windows uses backslash to separate different entities but linux uses forward slash
- The universal '/etc' directory usually stores configuration files

3.

- tar -czvf archive.tar.gz filename.txt will compress the selected text file file
- Tar -xvf archive.tar can extract the given archive file
- The relative commands would be :
tar -cf file.tar file.txt AND gzip file.tar

4.

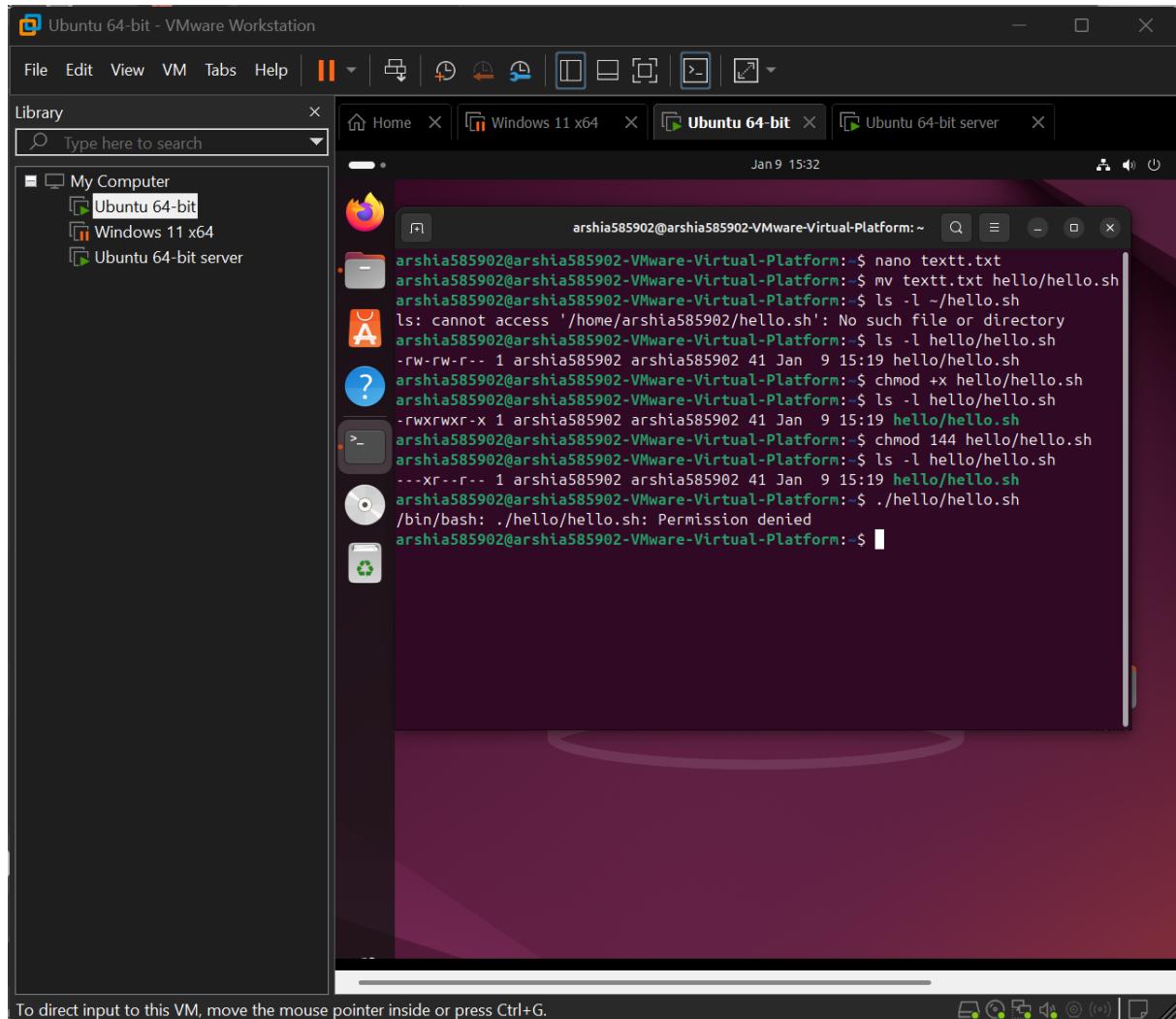
- htop is a dynamic environment that reports the use of system resources such as CPU, RAM, processes and system load. Similar to what task manager does on windows

5

- neofetch displays an abstract summary of the system hardware, OS and its software environment in a visually pleasing way

Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation



Assignment 5.6: View the contents of files

Relevant screenshots + motivation

- It has 12306 lines, 107562 words, 607504 characters
- Lines 490 and 1124

The image displays two screenshots of a VMware Workstation interface, both showing an Ubuntu 64-bit virtual machine. The left screenshot shows a terminal window with the following command and output:

```
arshtia585902@arshtia585902-VMware-Virtual-Platform:~/Downloads$ cd ..;/Downloads
arshtia585902@arshtia585902-VMware-Virtual-Platform:~/Downloads$ wc 1661-0.txt
12306 107562 607584 1661-0.txt
arshtia585902@arshtia585902-VMware-Virtual-Platform:~/Downloads$ grep -n "kingdom"
1661-0.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
arshtia585902@arshtia585902-VMware-Virtual-Platform:~/Downloads$ head -n 1130 1661
-0 | tail -n 485
"My cabby drove fast. I don't think I ever drove faster, but the others
were there before us. The cab and the landau with their steaming horses
were in front of the door when I arrived. I paid the man and hurried
into the church. There was not a soul there save the two whom I had
followed and a surprised clergyman, who seemed to be expostulating with
them. They were all three standing in a knot in front of the altar. I
lounged up the side aisle like any other idler who has dropped into a
church. Suddenly, to my surprise, the three at the altar faced round to
me, and Godfrey Norton came running as hard as he could towards me.
```

The right screenshot shows the same terminal window with the following command and output:

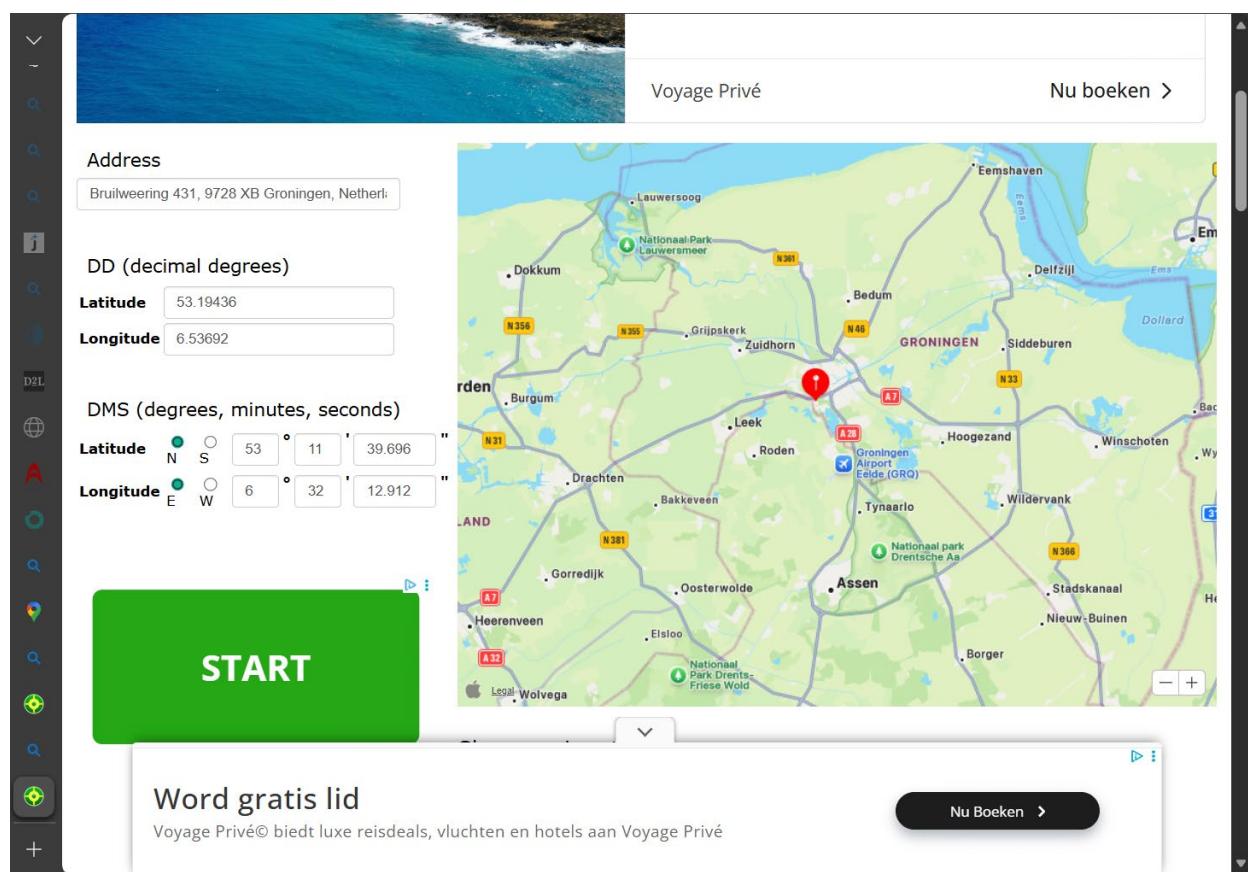
```
arshtia585902@arshtia585902-VMware-Virtual-Platform:~/Downloads$ head -n 1129 1661
-0.txt | tail -n 19
"You have but to name it."
A "This photograph!"
? The King stared at him in amazement.
> "Irene's photograph!" he cried. "Certainly, if you wish it."
I thank your Majesty. Then there is no more to be done in the matter.
I have the honour to wish you a very good morning." He bowed, and,
turning away without observing the hand which the King had stretched
out to him, he set off in my company for his chambers.
And that was how a great scandal threatened to affect the kingdom of
Bohemia, and how the best plans of Mr. Sherlock Holmes were beaten by a
woman's wit. He used to make merry over the cleverness of women, but I
have not heard him do it of late. And when he speaks of Irene Adler, or
when he refers to her photograph, it is always under the honourable
title of _the_ woman.
arshtia585902@arshtia585902-VMware-Virtual-Platform:~/Downloads$
```

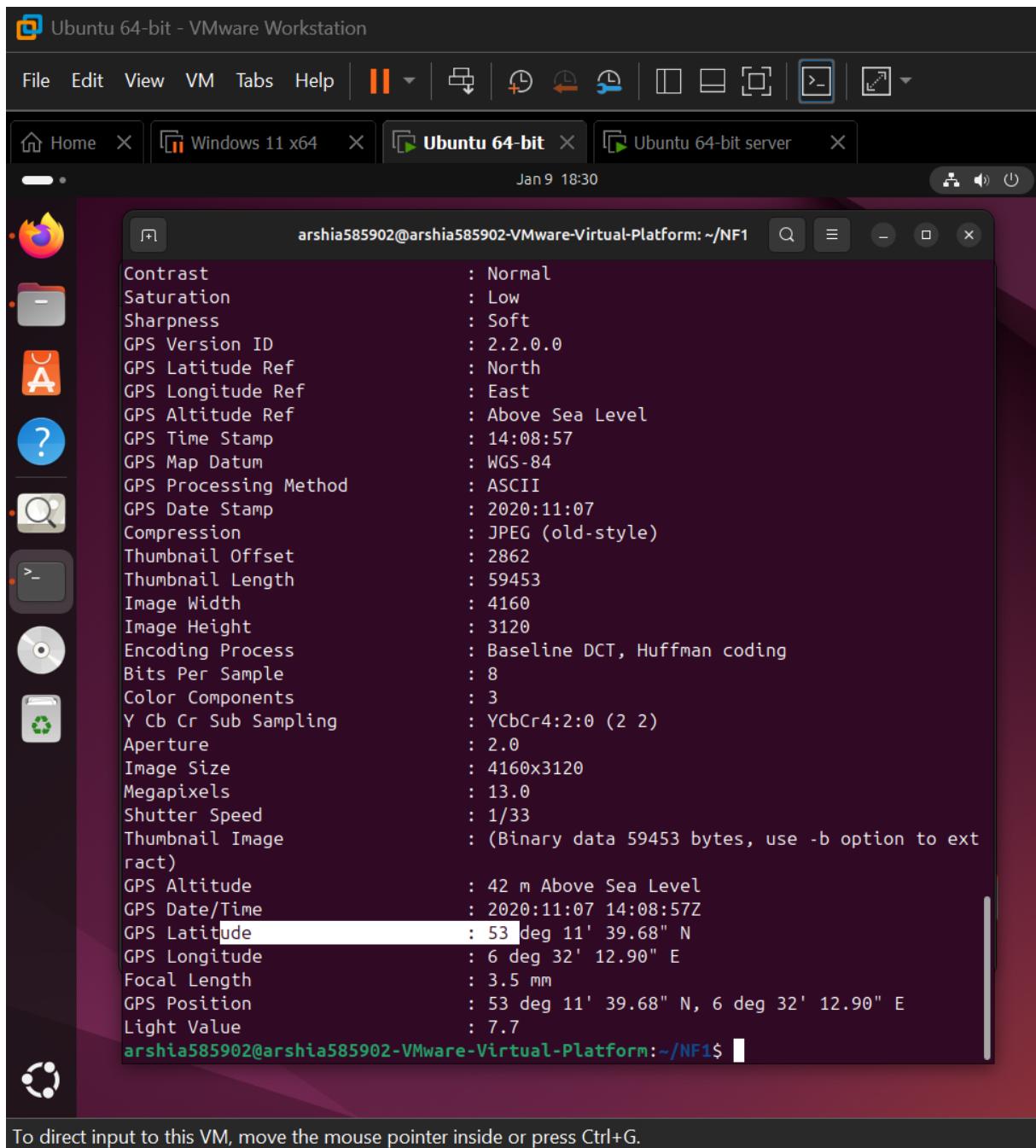
Assignment 5.7: Digital forensics

Relevant screenshots + motivation

- The phone was from the brand Motorola
- There are a lot of GPS details:
 - Gps altitude: 42 m above sea level
 - Gps latitude 53 deg 11' 39.68" N
 - Gps longitude 6 deg 32' 12.90" E
 - Gps position: 53 deg 11' 39.68" N, 6 deg 32' 12.90" E

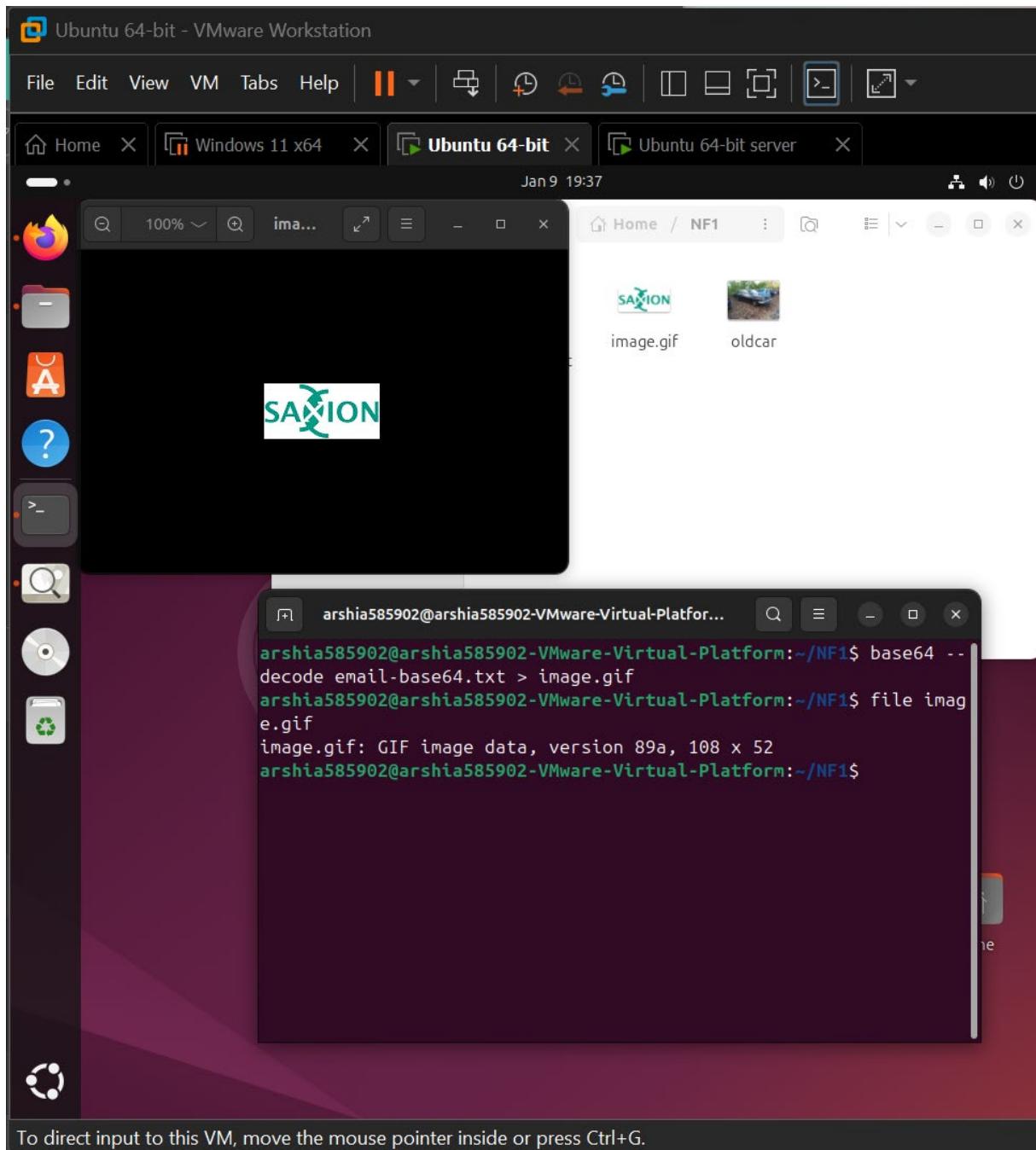
Groningen, Netherlands





```
arshia585902@arshia585902-VMware-Virtual-Platform:~/NF1$ mv oldcar.jpg oldcar
arshia585902@arshia585902-VMware-Virtual-Platform:~/NF1$ 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, manufac-
turer=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
arshia585902@arshia585902-VMware-Virtual-Platform:~/NF1$
```

Ubuntu still considers the file as an image even after the removal of its extention

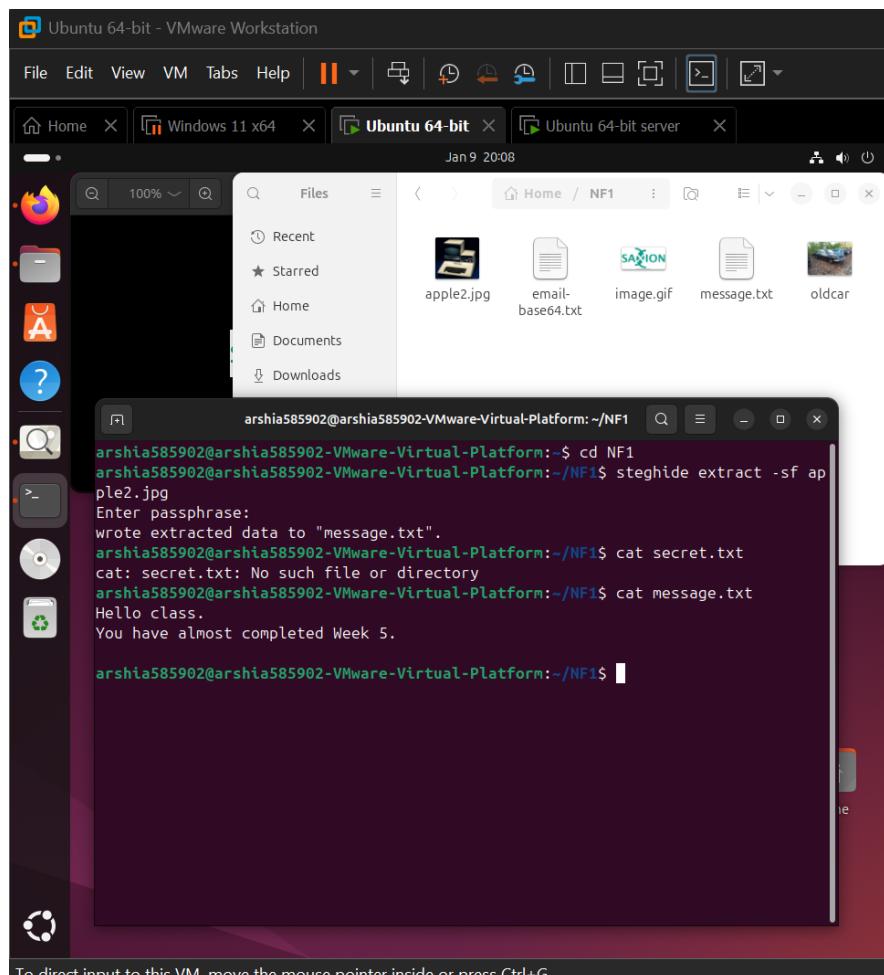


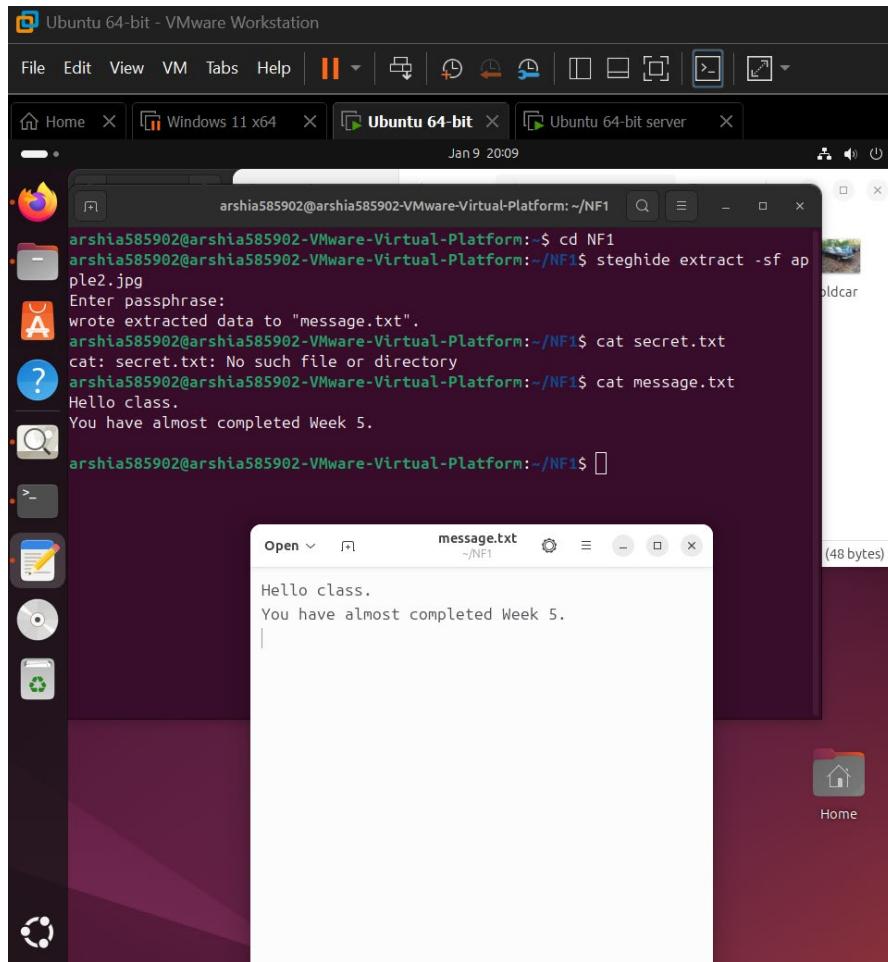
Summary: using scp I sent the encoded text file from my host to ubuntu then on ubuntu i used the encode feature of the command base64 which handled all the encoding so I didn't have to do the decryption part. In the same command I told it to store the output in 'image.gif' file. And that file was immediately there in the relative directory on the ubuntu. Although the essence of the file could clearly bee seen, I proceeded to inquire its type to see what file type the ubuntu believes it is so that the mystery could be officially confirmed. Using output redirection i sent the output of the base64 process to a different file container. Base64 is a text encoding for binary data; decoding it restores the original binary file which can be saved using output redirection



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.

Bellow are all the relevant screenshots

A quick test on my actual host to make sure the ip address of Debian is fine:

```
arshia@image: ~ x + v - □ ×
C:\Users\shahr>ssh arshia@192.168.139.132
arshia@192.168.139.132's password:
Welcome to Ubuntu 24.04.3 LTS (GNU/Linux 6.8.0-90-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/pro

System information as of Fri Jan  9 07:55:46 PM UTC 2026

System load: 0.0          Processes:            223
Usage of /: 5.1% of 125.43GB  Users logged in:      1
Memory usage: 8%           IPv4 address for ens33: 192.168.139.132
Swap usage:  0%

* Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
just raised the bar for easy, resilient and secure K8s cluster deployment.

https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

55 updates can be applied immediately.
To see these additional updates run: apt list --upgradable

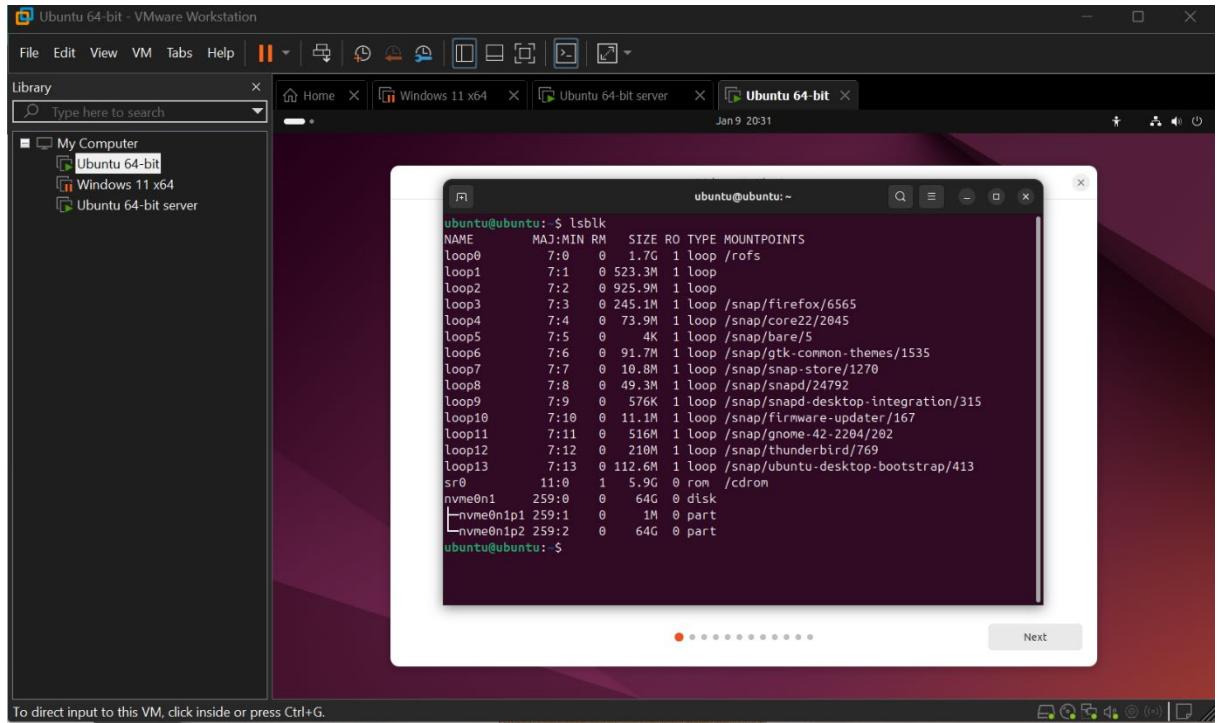
Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

arshia@image:~$ |
```

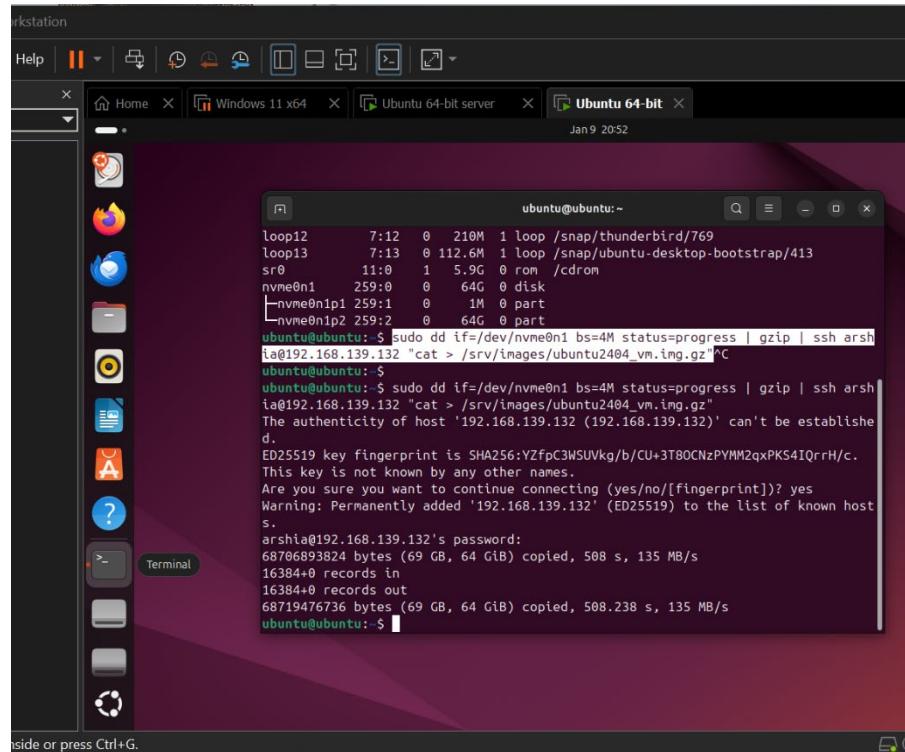
Almost the entire thing that has been entered in Debian (in my case its another ubuntu but this time web server that provides Debian):

```
Ubuntu 64-bit server VMware Workstation
File Edit View VM Tabs Help || Home Windows 11 x64 Ubuntu 64-bit server Ubuntu 64-bit | Ubuntu 64-bit |
Library Type here to search
My Computer Ubuntu 64-bit
Windows 11 x64 Ubuntu 64-bit
Ubuntu 64-bit server Ubuntu 64-bit
[sudo] password for arshia:
Hit:1 http://nl.archive.ubuntu.com/ubuntu noble InRelease [126 kB]
Get:2 http://nl.archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]
Get:3 http://nl.archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]
Get:4 http://nl.archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [175 kB]
Get:5 http://nl.archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [212 kB]
Get:7 http://nl.archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [378 kB]
Get:8 http://nl.archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [1940 kB]
Get:9 http://nl.archive.ubuntu.com/ubuntu noble-backports/main amd64 Packages [739 kB]
Get:10 http://nl.archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Packages [216 kB]
Get:11 http://nl.archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [10,5 kB]
Get:12 http://nl.archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Packages [212 kB]
Get:13 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [21,5 kB]
Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [212 kB]
Get:15 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [71,4 kB]
Get:16 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [212 kB]
Fetched 1,044 kB in 1s (1,463 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading status information... Done
SSS packages can be upgraded. Run 'apt list --upgradable' to see them.
arshia@image:~$ sudo apt install openssh-server -y
Reading package lists... Done
Building dependency tree... Done
Reading status information... Done
openssh-server is already the newest version (1:9.1+1~ubuntus13.14).
0 upgraded, 0 newly installed, 0 to remove and 55 not upgraded.
arshia@image:~$ sudo systemctl enable --now ssh
Synchronizing state of ssh.service with /usr/lib/systemd/systemd-sysv-install.
Exception: /usr/lib/systemd/systemd-sysv-install failed to hash service script with /usr/lib/systemd/systemd-sysv-install.
Created symlink /etc/systemd/system/ssh.service → /usr/lib/systemd/system/ssh.service.
Created symlink /etc/systemd/system/multi-user.target.wants/ssh.service → /usr/lib/systemd/system/ssh.service.
arshia@image:~$ sudo chmod +r /srv/images
arshia@image:~$ ls
1: <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_lifETIME forever
            preferred_lifETIME forever
            link.valid_lifETIME forever
            link.preferred_lifETIME forever
2: ens3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:65:6e:0d brd ff:ff:ff:ff:ff:ff
        altname enp3s0
        link.valid_lifETIME 139.192.24 metric 100 brd 192.168.139.255 scope global dynamic ens3
            link.valid_lifETIME 1278sec preferred_lifETIME 1278sec
            link.valid_lifETIME 1278sec preferred_lifETIME 1278sec
            link.valid_lifETIME 1278sec preferred_lifETIME 1278sec
            link.valid_lifETIME 1278sec preferred_lifETIME 1278sec
arshia@image:~$ _
```

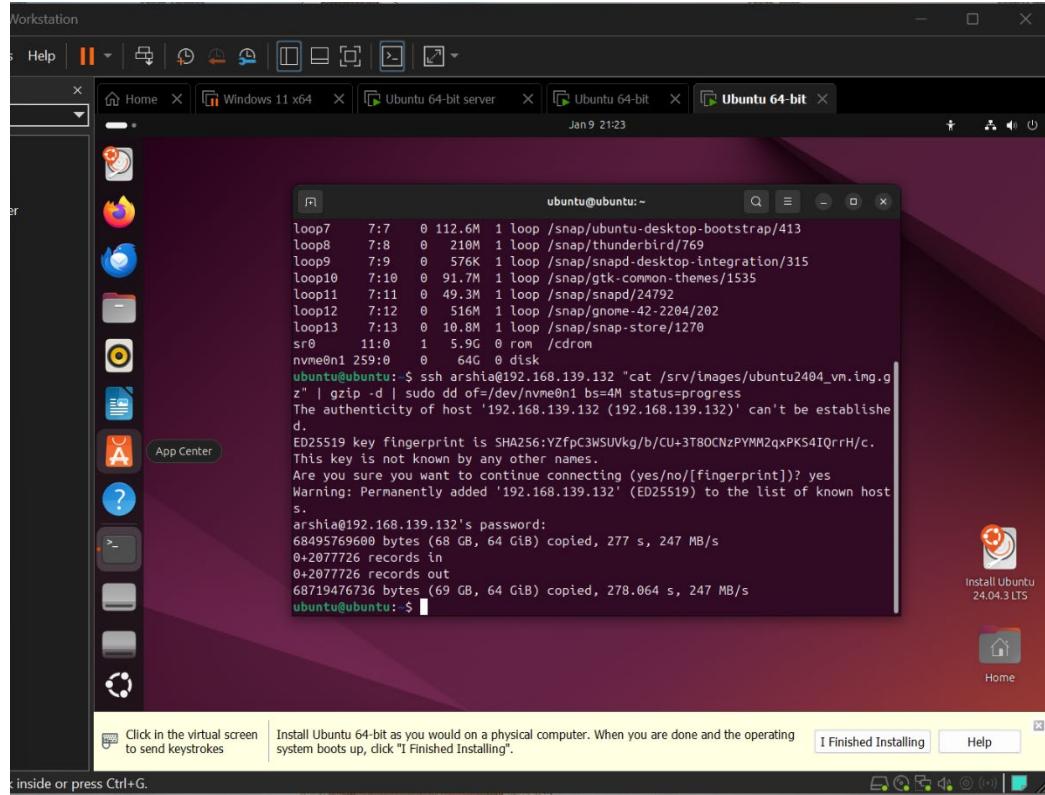
inquiry of the disks and partitions on my actual ubuntu (not the one that was installed later); so that I don't accidentally damage the wrong disk (this ubuntu is the original but its name is not showing because its being booted in UEFI mode not the prior BIOS mode)



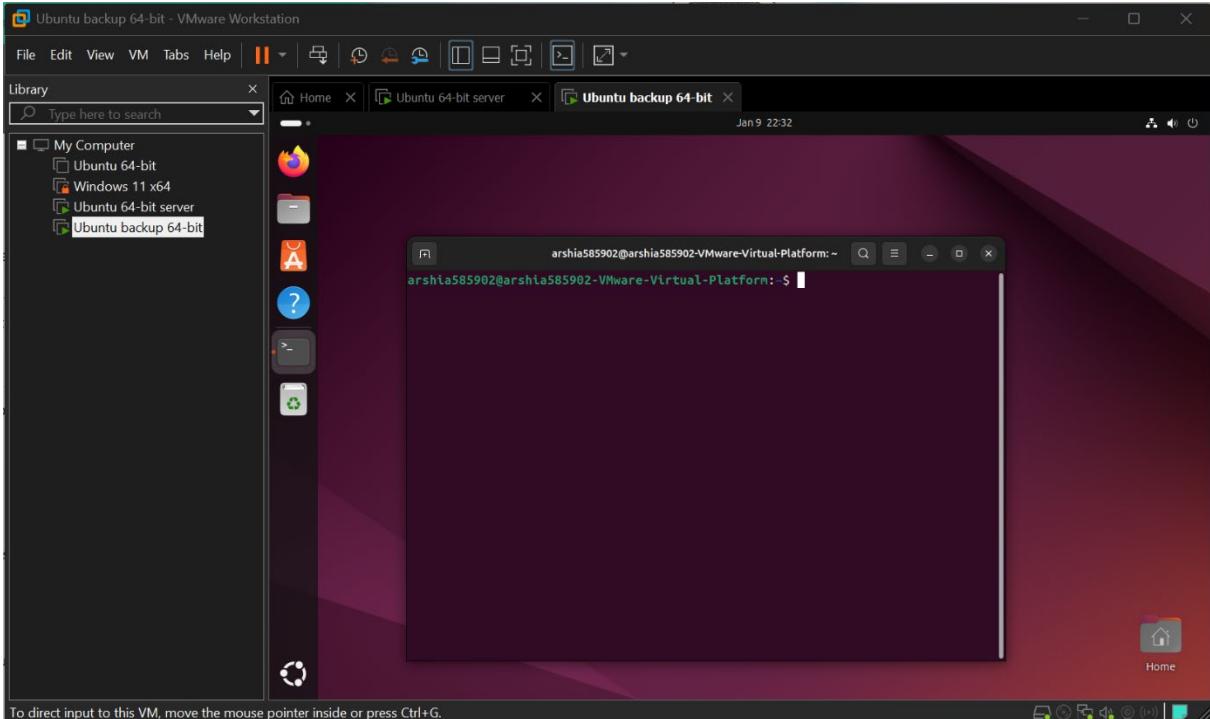
Proof that the original ubuntu was completely backed up and ready to be loaded on a new VM:



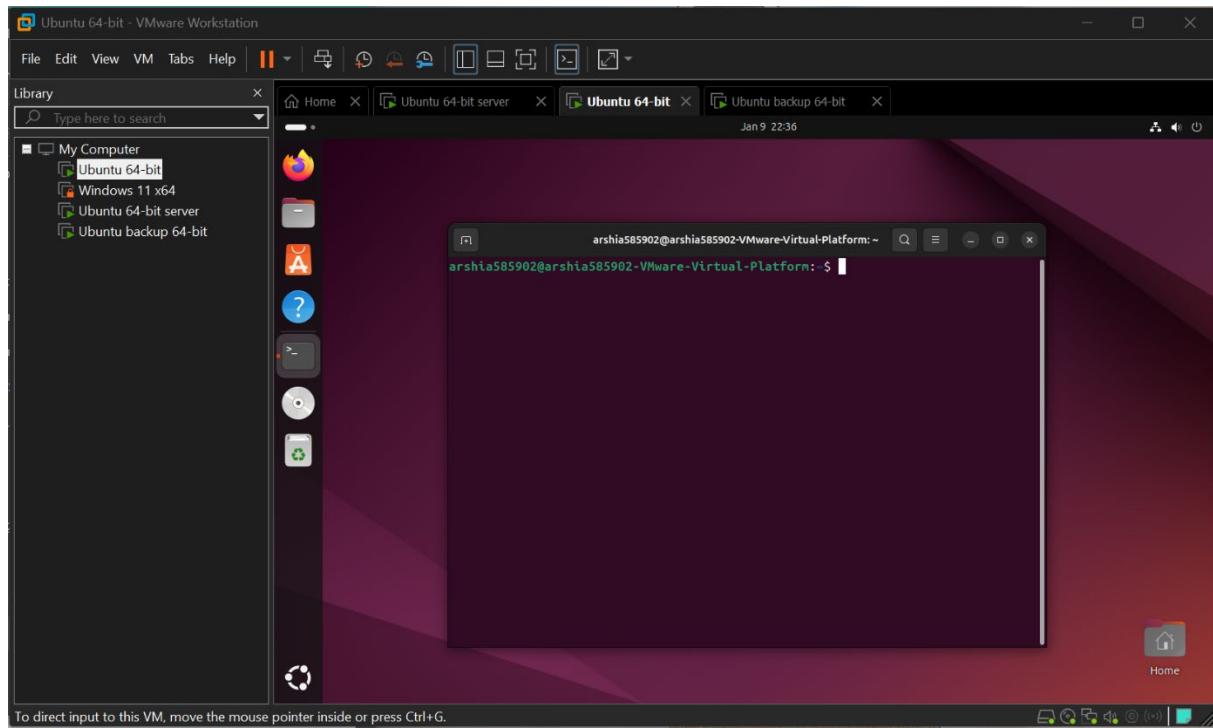
Proof that the new vm was completely loaded from the backup disk: pay attention to the main comment starting with SSH and not with sudo (unlike the original one)



environment of the backup version (the newly installed)



Environment of the original ubuntu (note the different left pannel namings despite the identical looks)



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