Template Week 5 – Operating Systems

Student number: 589531

Assignment 5.1: Unix-like

a) Find out what the difference is between UNIX and unix-like operating systems?
Unix was eerst gemaakt voor bedrijven rond de jaren 60 – 70, unix like OS lijken op het UNIX maar zijn gewoon bruikbaar voor iedereen,

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: Hij was bedenker van UNIX. Dennis Ritchie: Hij ontwikkelde C en werkte samen met Ken aan UNIX. Bill Joy: Hij ontwikkelde BSD UNIX en maakte ook C shell en vi. Richard Stallman: Hij zetten het GNU project op. Linus Torvalds: Hij ontwikelde linux.

c) What is the philosophy of the GNU movement?
De vrijheid van software gebruiken, aanpassen en delen het moet wel Open source zijn.

d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.
Ja, omdat het ten eerste is gebaseerd is op Linux en het gebruikt ook veel GNU softwares

e) Find out what is the Windows Subsystem for Linux?
Dat zorgt ervoor dat je linux commands can runnen binnen windows zonder een VM.

f) Find out, which operating system family belongs to Android, iOS and ChromeOS?
Andriod = Linux kernel. IOS = Unix/BSD. ChromeOS = Linux

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 voor zeer zware berekeningen die normale computers niet aankunnen. Ze worden gebruikt voor klimaatonderzoek, wetenschappelijk onderzoek, SIMS, medisch onderzoek en ruimtevaart. Ze kunnen grote hoeveelheden data in korte tijd verwerken.

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 PS3 cluster is een aantal PS3 die aan elkaar werd gekoppend om samen berekningen te doen net een supercomputer.

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?
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/
Nee, dit cluster is niet gemaakt om snel te zijn maar voor experimenten

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?

PS5 = Architecture x86-64 AMD
OS = custom unix achtige os

XBOX= Architecture x86-64 AMD
OS = Windowsbased OS

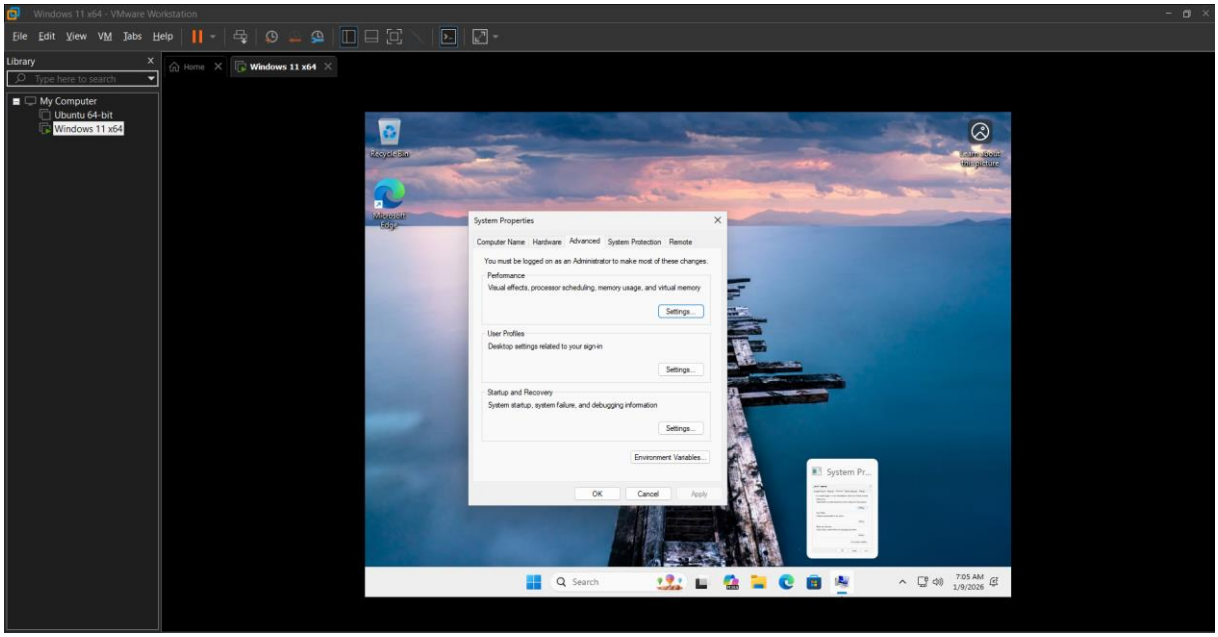
Assignment 5.3: Working with Windows

Take relevant screenshots of the assignments below

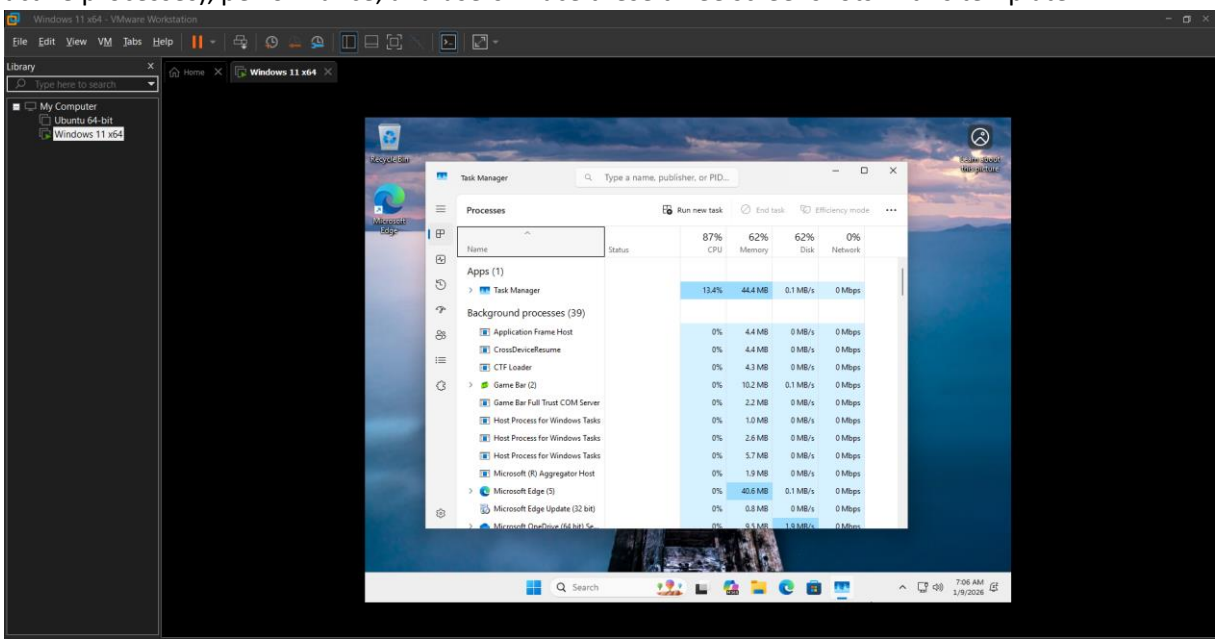
a) Practice for about 10 minutes with the ⊞ keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.

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

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.



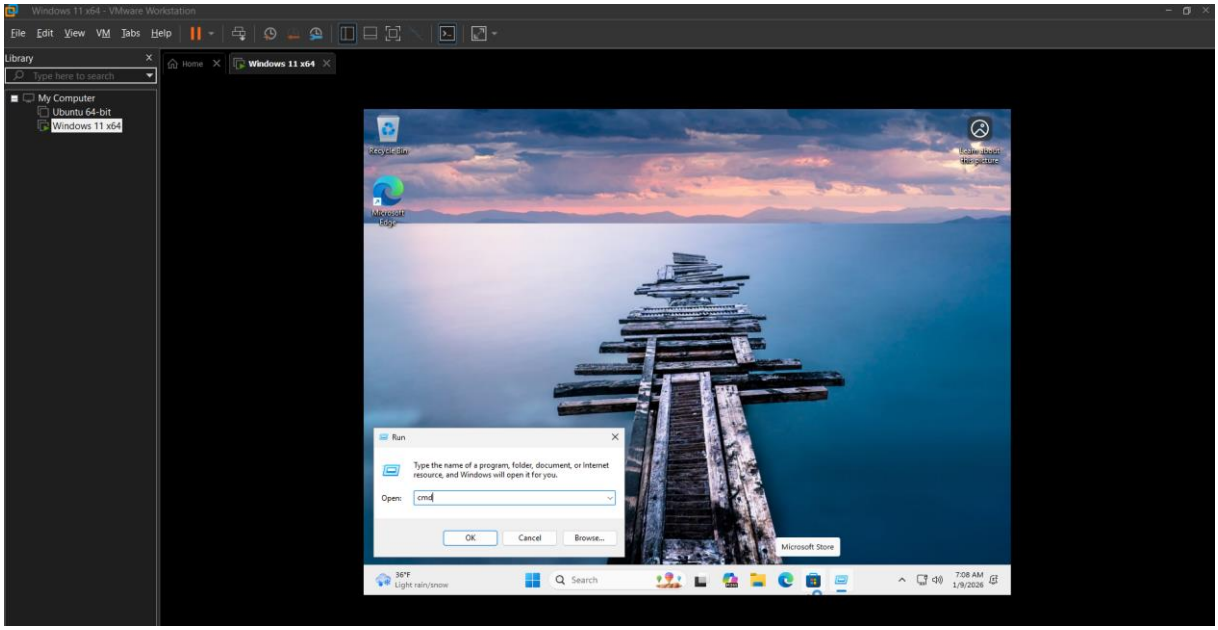
e) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector,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

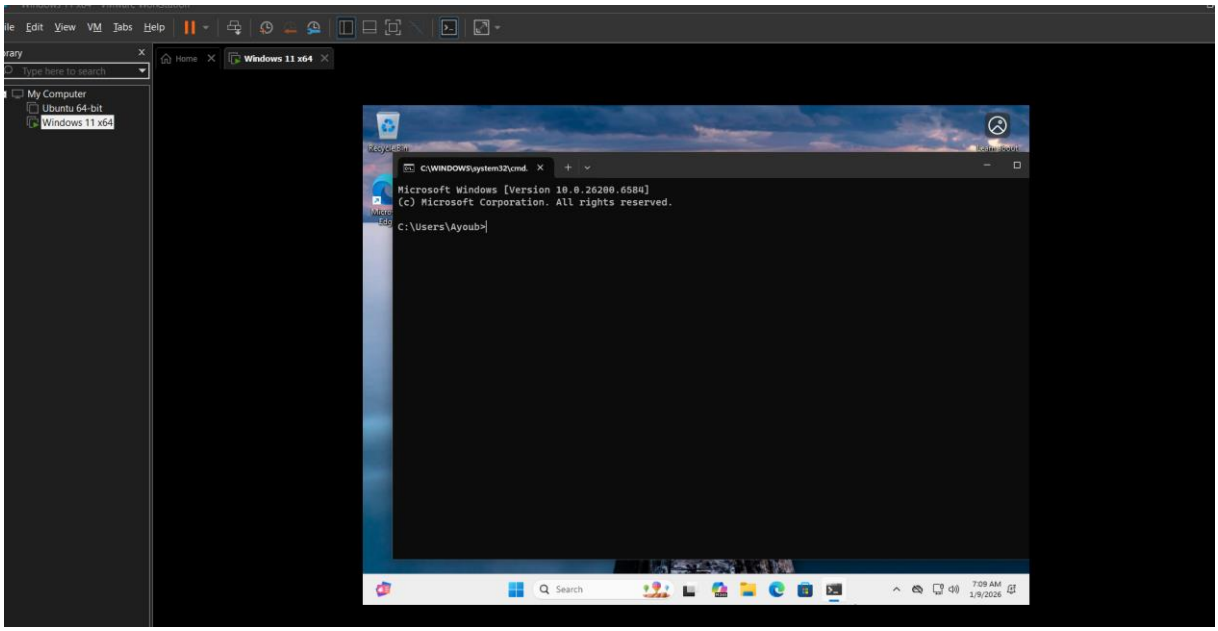
Win key + P

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?

Win key + L

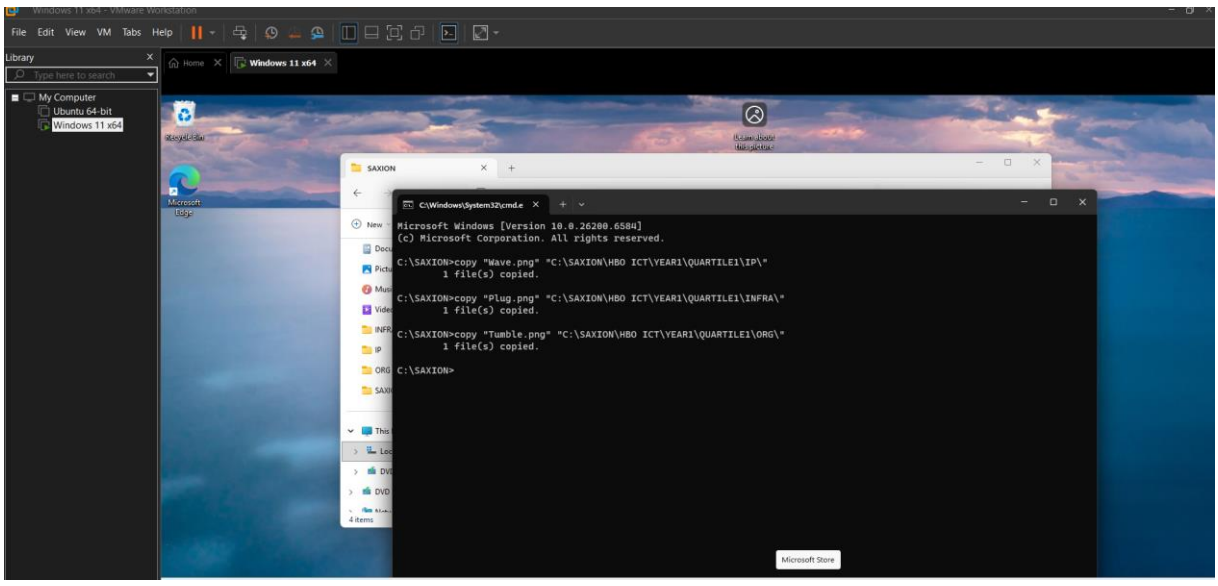
g) Open the Run screen with a key combination. On this screen, type CMD and press <enter>. Take a screenshot of this result and paste it into this template.



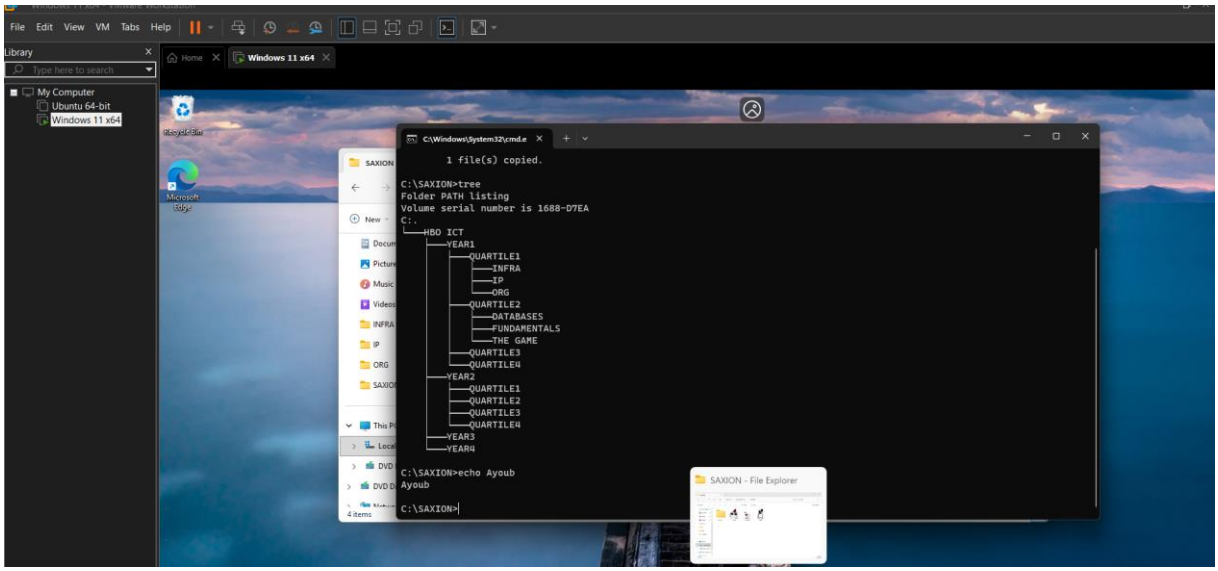


Working in the File Explorer

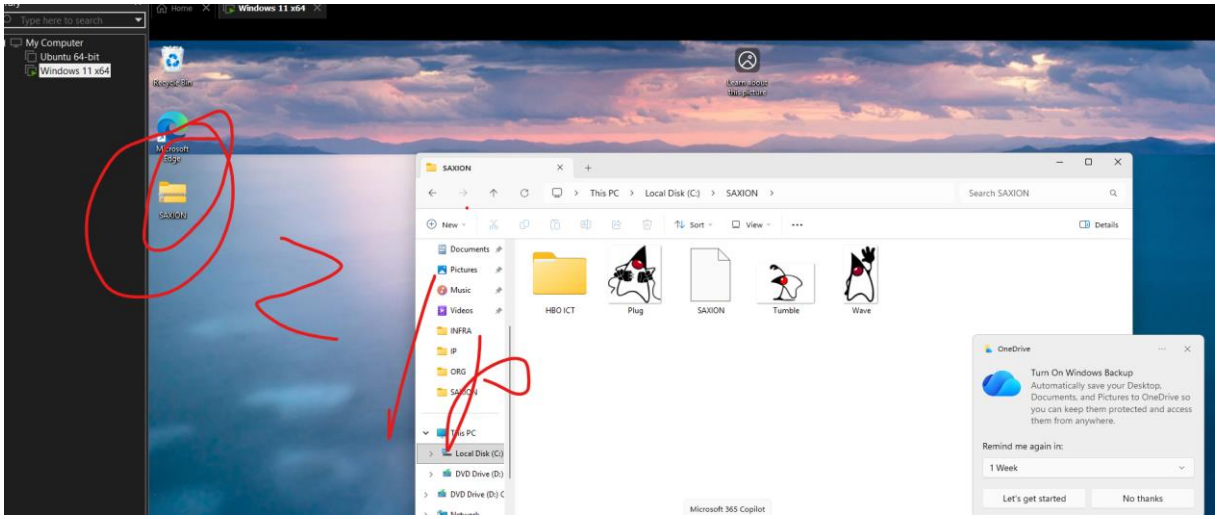
Relevant screenshots **copy** command:



Relevant screenshots **tree** command:

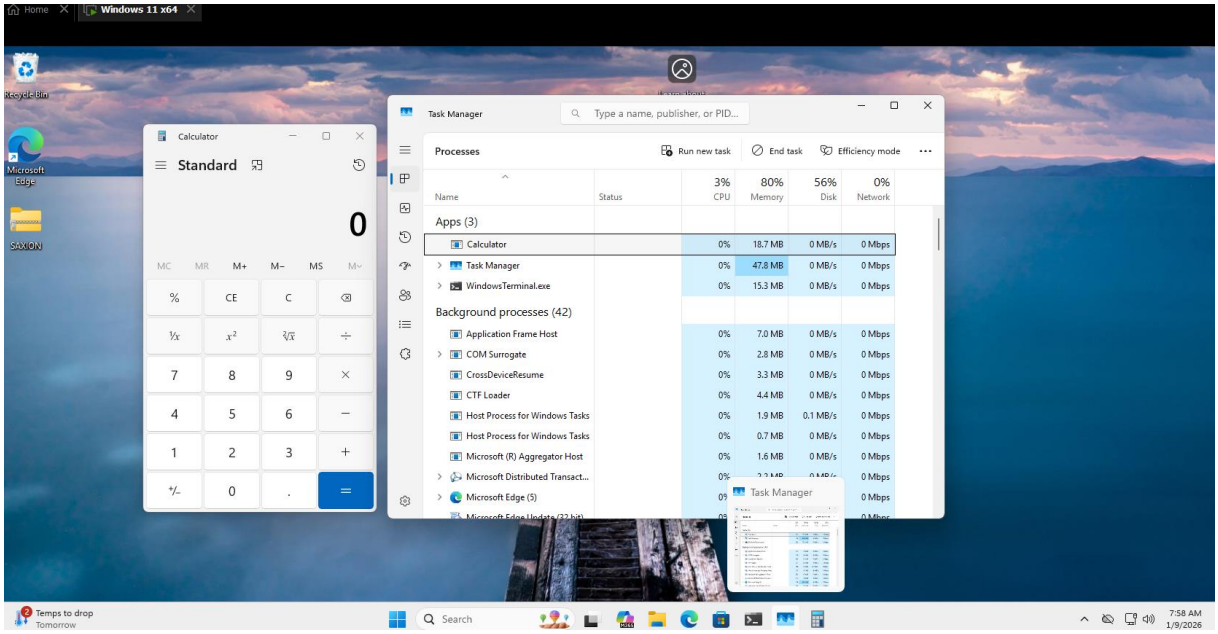


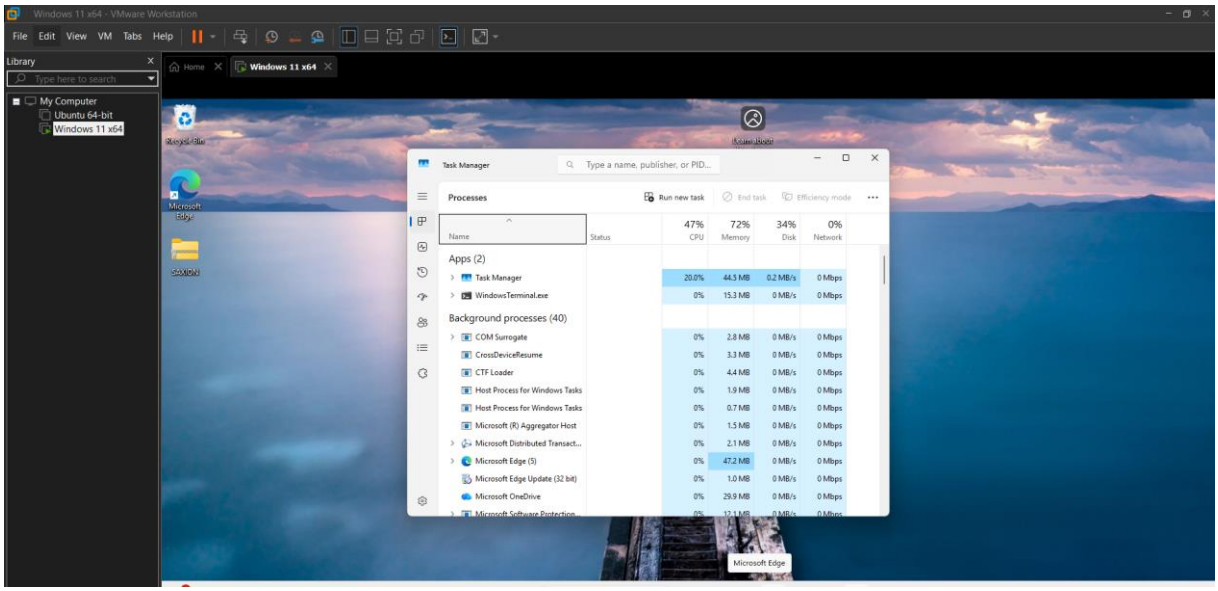
Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



Terminating Processes

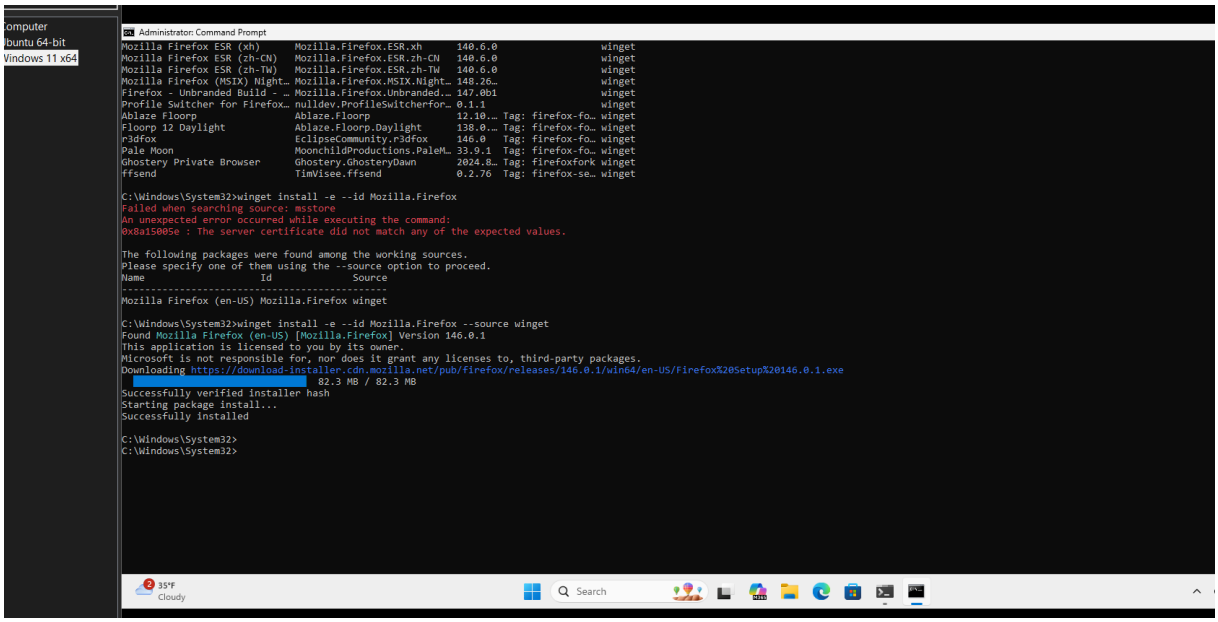
Relevant Screenshots Task Manager Window:

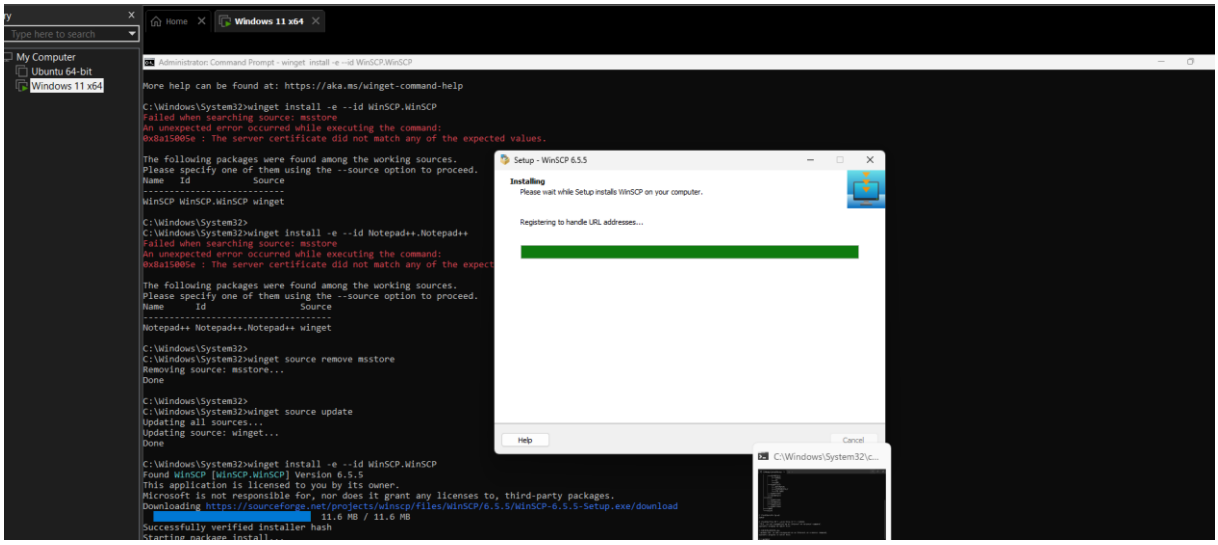


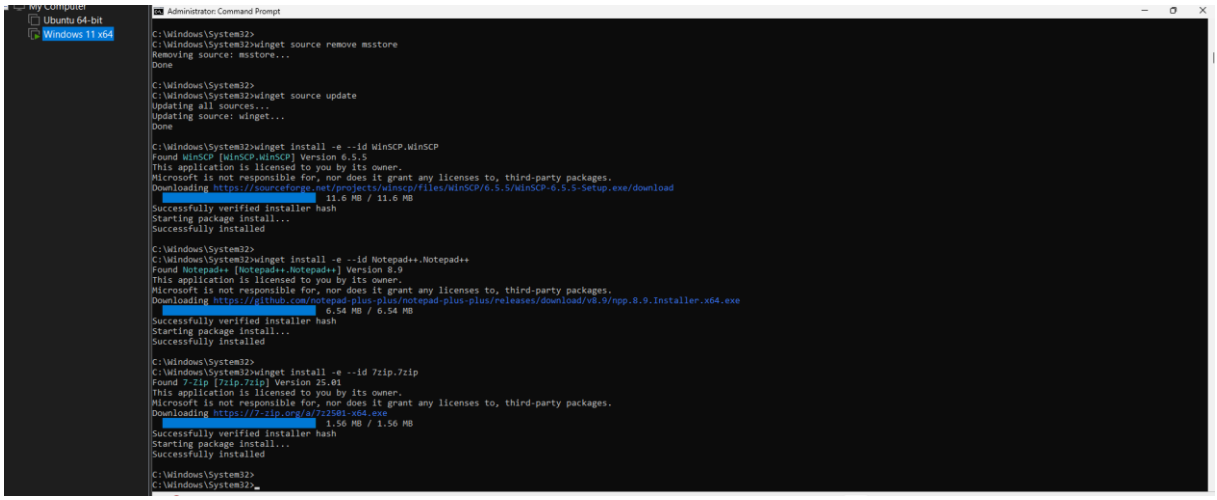


Install Software

Relevant screenshots that the following software is installed with winget:



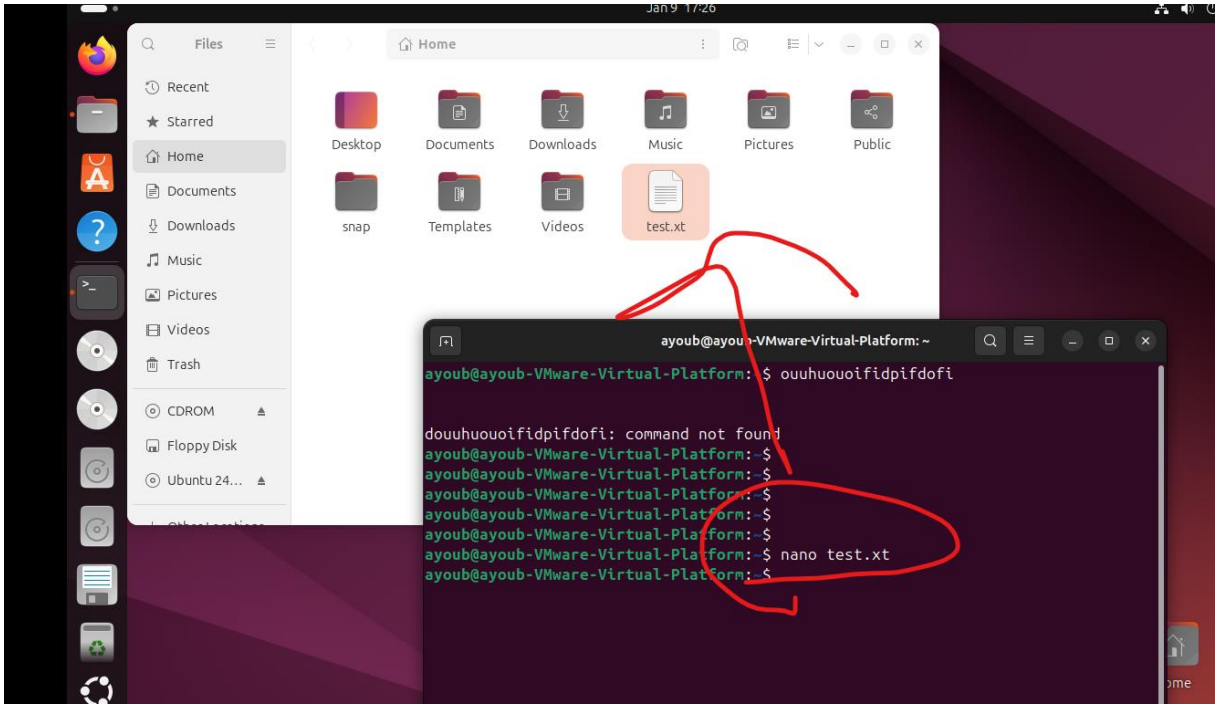




- WinSCP
- Notepad++
- 7zip

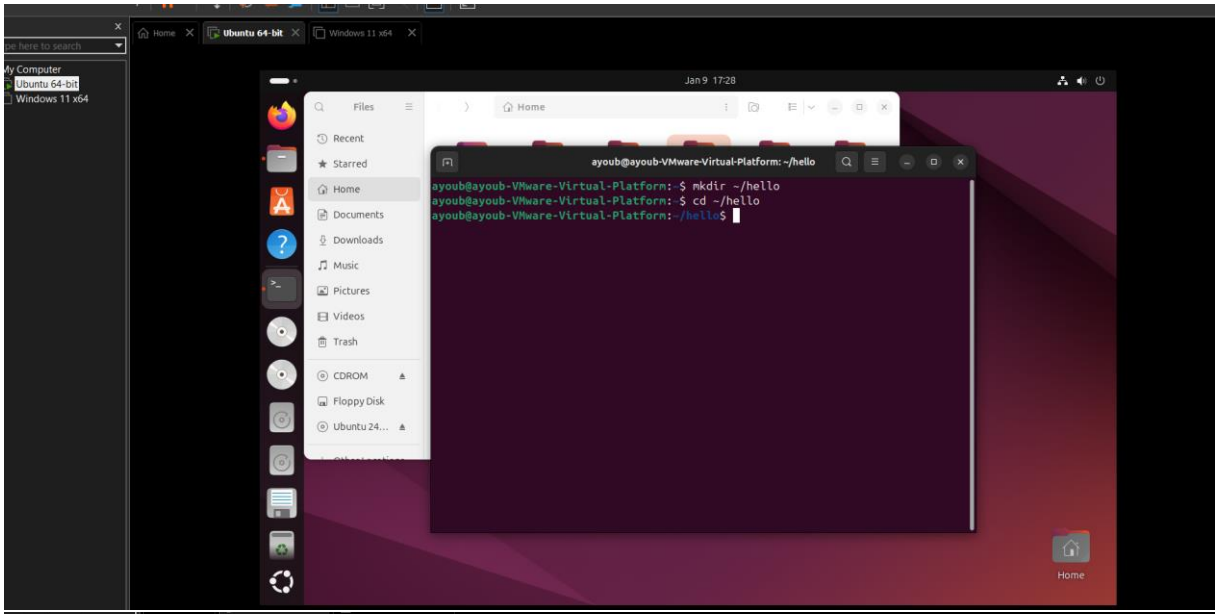
Assignment 5.4: Working with Linux

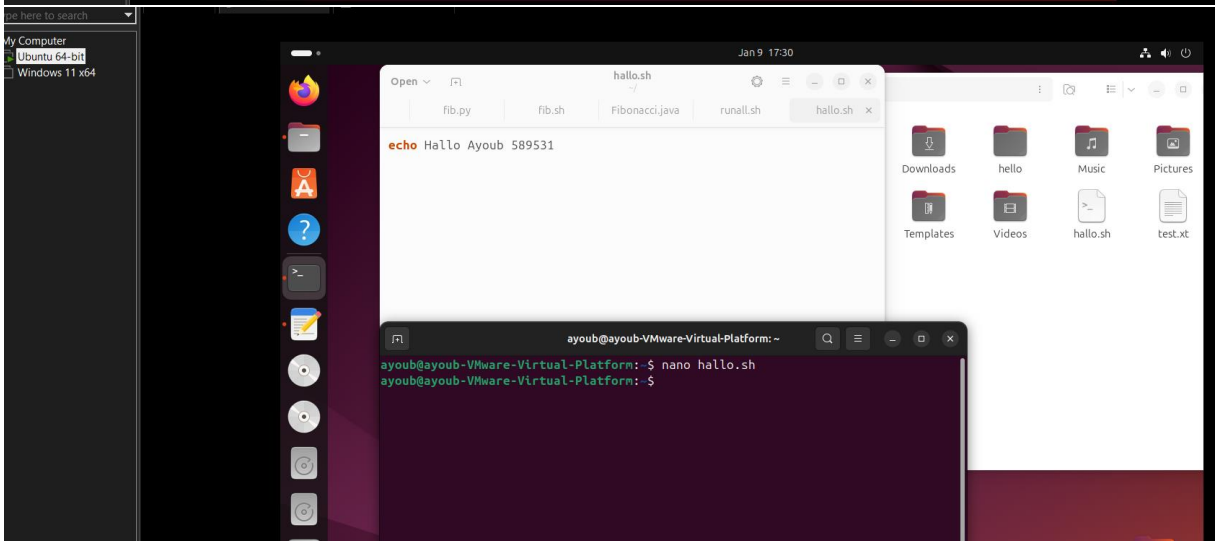
Relevant screenshots + motivation



Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation





Assignment 5.6: View the contents of files

Relevant screenshots + motivation

Cat = laat volledige inhoud zien van een file

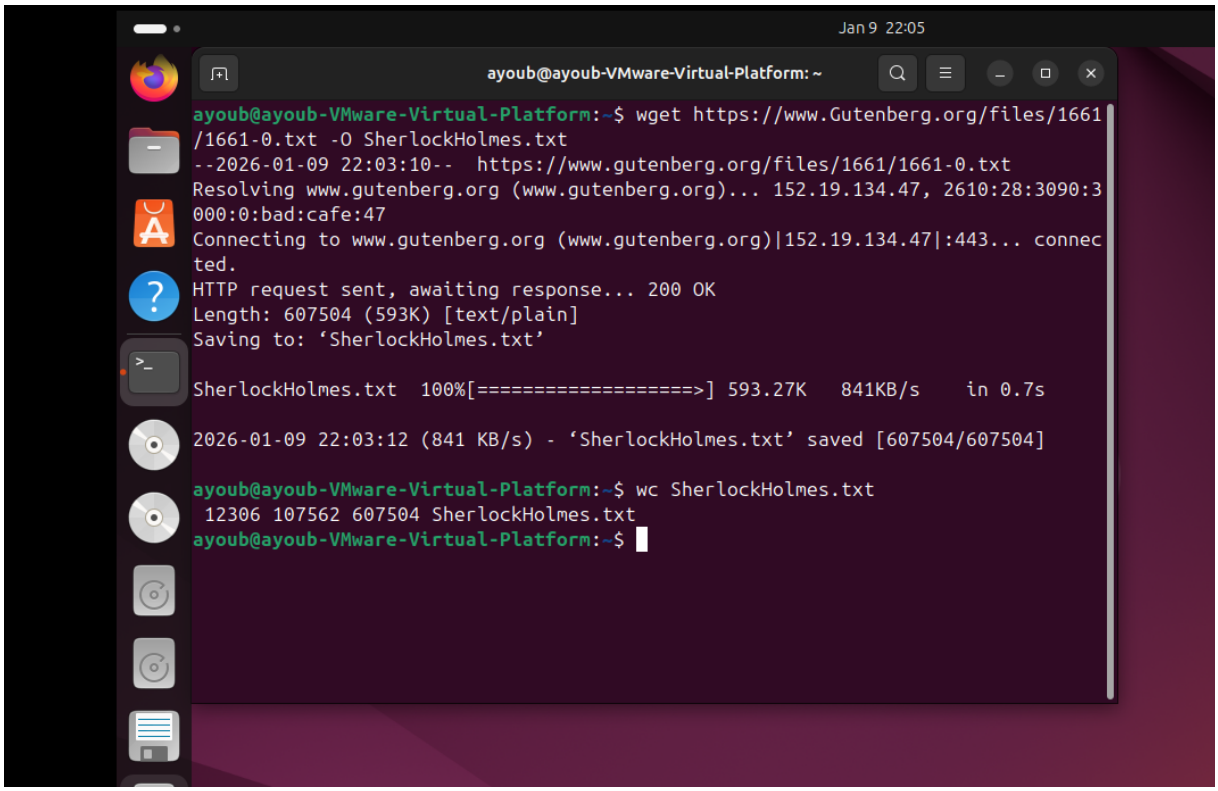
Wc = telt de aantal woorden, regels en tekens

Less = bekijkt een bestand

Head = laat de eerste line zien

Tail = laatste regel van file zien

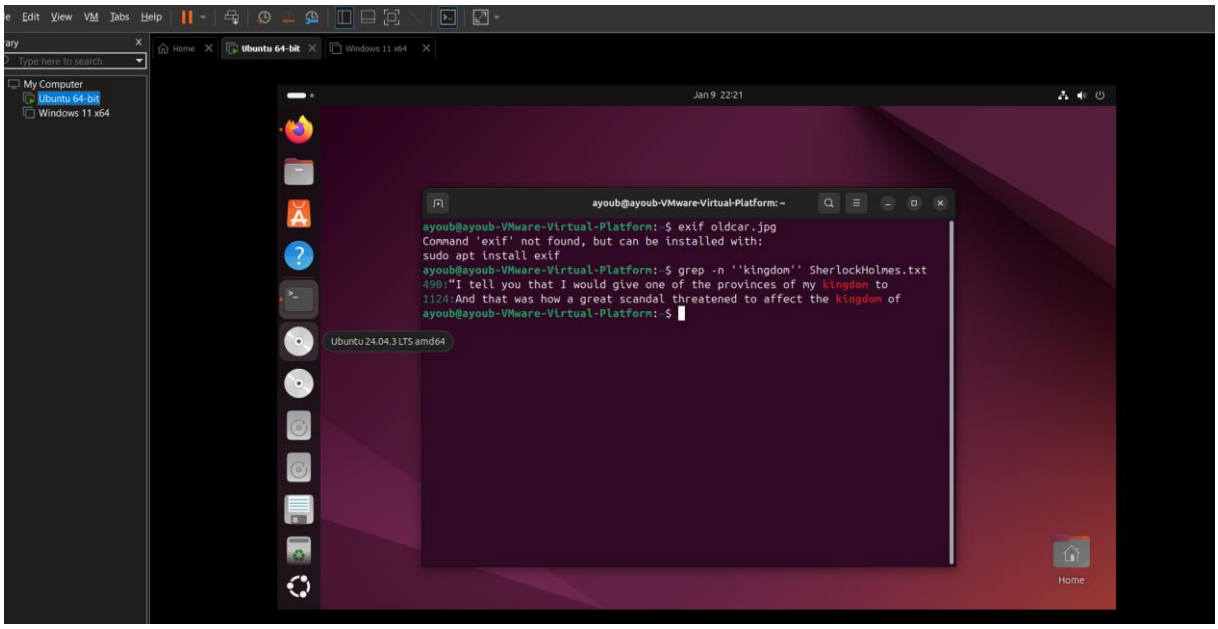
Grep = zoekt een specifiek word



Lines = 12306

Words = 107562

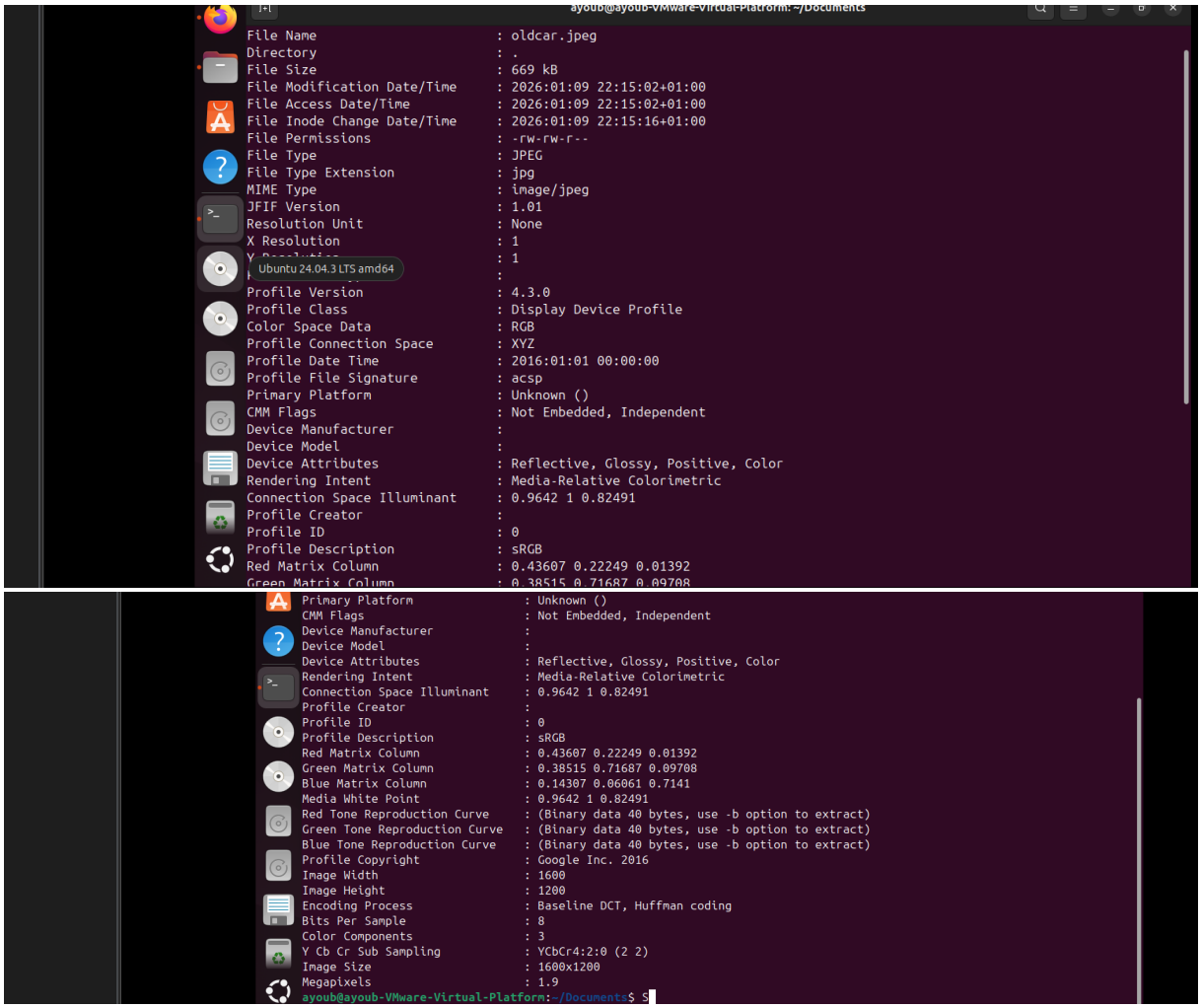
Characters = 607504



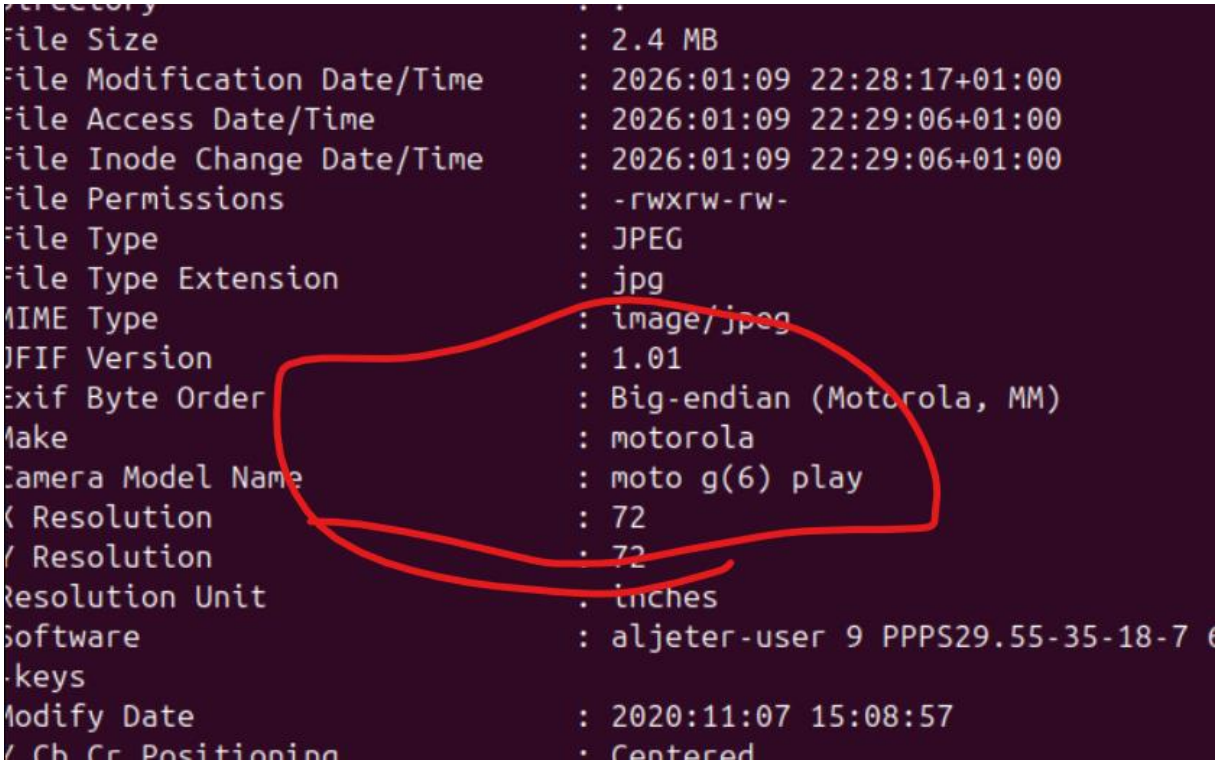
Op 490 en 1124

Assignment 5.7: Digital forensics

Relevant screenshots + motivation


ayoub@ayoub-VMware-Virtual-Platform: ~/Documents
File Name : oldcar.jpeg
Directory : .
File Size : 669 kB
File Modification Date/Time : 2026:01:09 22:15:02+01:00
File Access Date/Time : 2026:01:09 22:15:02+01:00
File Inode Change Date/Time : 2026:01:09 22:15:16+01:00
File Permissions : -rw-rw-r--
File Type : JPEG
File Type Extension : jpg
MIME Type : image/jpeg
JFIF Version : 1.01
Resolution Unit : None
X Resolution : 1
Ubuntu 24.04.3 LTS amd64
Profile Version : 4.3.0
Profile Class : Display Device Profile
Color Space Data : RGB
Profile Connection Space : XYZ
Profile Date Time : 2016:01:01 00:00:00
Profile File Signature : acsp
Primary Platform : Unknown ()
CMM Flags : Not Embedded, Independent
Device Manufacturer :
Device Model :
Device Attributes : Reflective, Glossy, Positive, Color
Rendering Intent : Media-Relative Colorimetric
Connection Space Illuminant : 0.9642 1 0.82491
Profile Creator :
Profile ID : 0
Profile Description : sRGB
Red Matrix Column : 0.43607 0.22249 0.01392

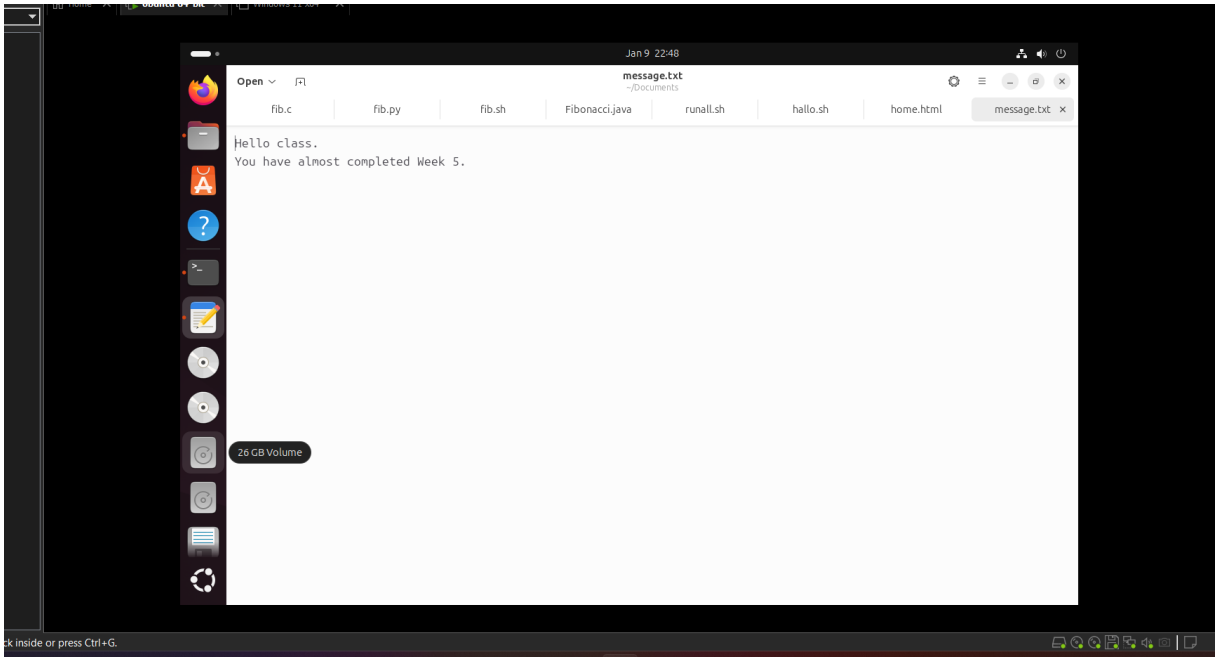
Primary Platform : Unknown ()
CMM Flags : Not Embedded, Independent
Device Manufacturer :
Device Model :
Device Attributes : Reflective, Glossy, Positive, Color
Rendering Intent : Media-Relative Colorimetric
Connection Space Illuminant : 0.9642 1 0.82491
Profile Creator :
Profile ID : 0
Profile Description : sRGB
Red Matrix Column : 0.43607 0.22249 0.01392
Green Matrix Column : 0.38515 0.71687 0.09708
Blue Matrix Column : 0.14307 0.06061 0.7141
Media White Point : 0.9642 1 0.82491
Red Tone Reproduction Curve : (Binary data 40 bytes, use -b option to extract)
Green Tone Reproduction Curve : (Binary data 40 bytes, use -b option to extract)
Blue Tone Reproduction Curve : (Binary data 40 bytes, use -b option to extract)
Profile Copyright : Google Inc. 2016
Image Width : 1600
Image Height : 1200
Encoding Process : Baseline DCT, Huffman coding
Bits Per Sample : 8
Color Components : 3
Y Cb Cr Sub Sampling : YCbCr4:2:0 (2 2)
Image Size : 1600x1200
Megapixels : 1.9
ayoub@ayoub-VMware-Virtual-Platform:~/Documents$ s


File Size : 2.4 MB
File Modification Date/Time : 2026:01:09 22:28:17+01:00
File Access Date/Time : 2026:01:09 22:29:06+01:00
File Inode Change Date/Time : 2026:01:09 22:29:06+01:00
File Permissions : -rwxrw-rw-
File Type : JPEG
File Type Extension : jpg
MIME Type : image/jpeg
JFIF Version : 1.01
Exif Byte Order : Big-endian (Motorola, MM)
Make : motorola
Camera Model Name : moto g(6) play
X Resolution : 72
Y Resolution : 72
Resolution Unit : inches
Software : aljeter-user 9 PPPS29.55-35-18-7
Keys
Modify Date : 2020:11:07 15:08:57
Y Cb Cr Positioning : Centered

```
Shutter Speed                   : 1/33
Thumbnail Image                 : (Binary data 59453 bytes, use -b option to e
ract)
GPS Altitude                    : 42 m Above Sea Level
GPS Date/Time                   : 2020:11:07 14:08:57Z
GPS Latitude                    : 53 deg 11' 39.68" N
GPS Longitude                   : 6 deg 32' 12.90" E
Focal Length                    : 3.5 mm
GPS Position                    : 53 deg 11' 39.68" N, 6 deg 32' 12.90" E
Light Value                     : 7.7
```

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**