Template Week 5 – Operating Systems

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Assignment 5.1: Unix-like

a) Find out what the difference is between UNIX and unix-like operating systems?
UNIX is an officialy cerified operating system, meanwhile unix-like isn't officially certified

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. and laid the foundation for modern operating systems.

Dennis Ritchie
Co-creator of UNIX and creator of the C programming language. enabling portable systems software.

Bill Joy
Developer of BSD UNIX and creator of tools like *vi*.

Richard Stallman
Founder of the GNU project and the Free Software Movement.

Linus Torvalds
Creator of the Linux kernel. making free UNIX-like operating systems widely available.

c) What is the philosophy of the GNU movement?
the belief that users should have control over the software they use.

d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement? Please explain your answer.
Yes, because Ubuntu uses GNU/Linux and open-source software.

e) Find out what is the Windows Subsystem for Linux?
The Windows Subsystem for Linux (WSL) lets developers install a Linux distribution (such as Ubuntu, OpenSUSE, Kali, Debian, Arch Linux, etc) and use Linux applications, utilities, and Bash command-line tools directly on Windows, unmodified, without the overhead of a traditional virtual machine or dualboot setup.

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

Android → Linux||**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 are extremely powerful computers used for tasks that require huge amounts of calculation and data processing. They are used in areas such as weather forecasting, climate modeling, scientific research, aerodynamics, nuclear simulations, and complex engineering tasks. These systems can solve mathematical models and run simulations much faster than regular computers, making them essential for research and high-priority scientific work.

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 computer system made by connecting multiple PS3 game consoles together to work as a computing cluster. Researchers took advantage of the PS3's powerful **IBM Cell processor** to run scientific and parallel computing tasks at low cost. These clusters were used for things like astrophysics simulations, gravitational physics research, and other scientific calculations that need high performance.

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 Autonomous 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. The Top500 list ranks the world's fastest supercomputers, which are high-performance machines with massive computing power. A Raspberry Pi cluster—even with hundreds or thousands of nodes—does not have performance close to those professional systems, so it would not be listed among the Top500.

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?

64-bit x86-64AMD

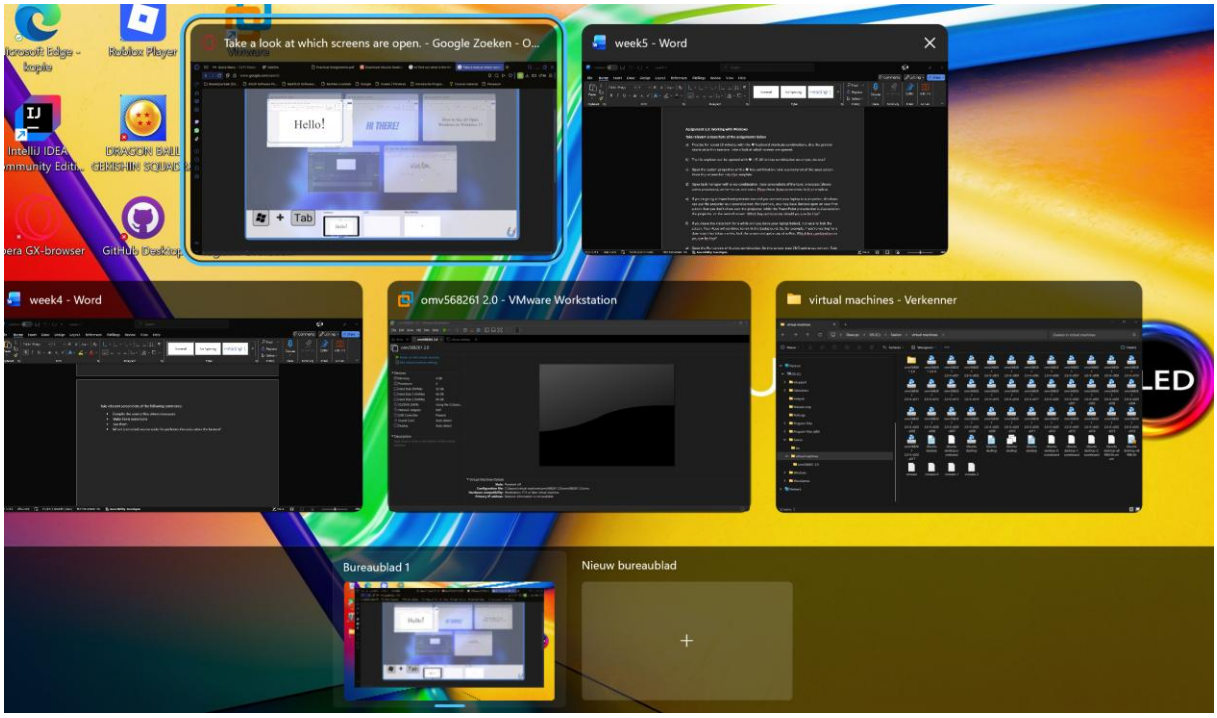
PS5 → UNIX/BSD based

XBOX → Windows-based OS

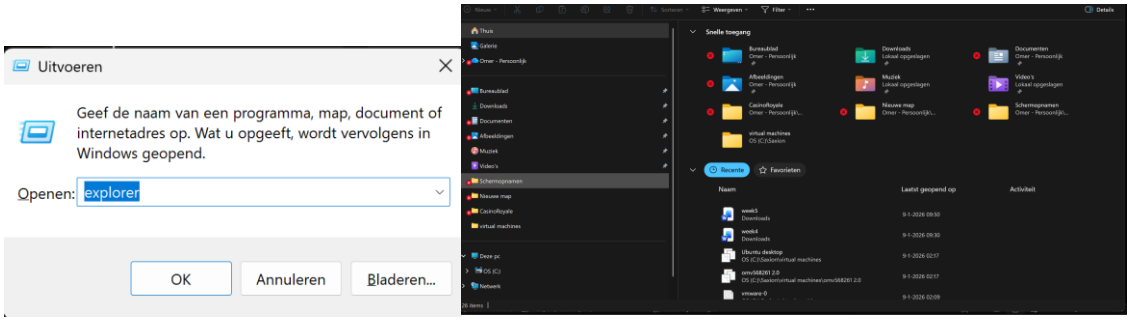
Assignment 5.3: Working with Windows

Take relevant screenshots of the assignments below

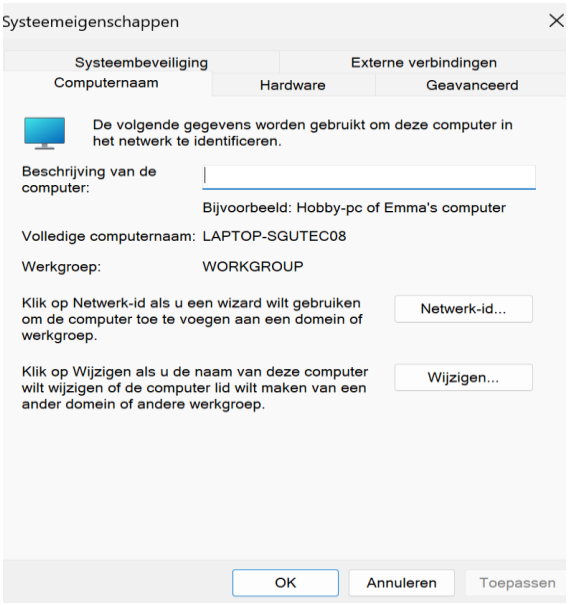
a) Practice for about 10 minutes with the ⊞ keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.



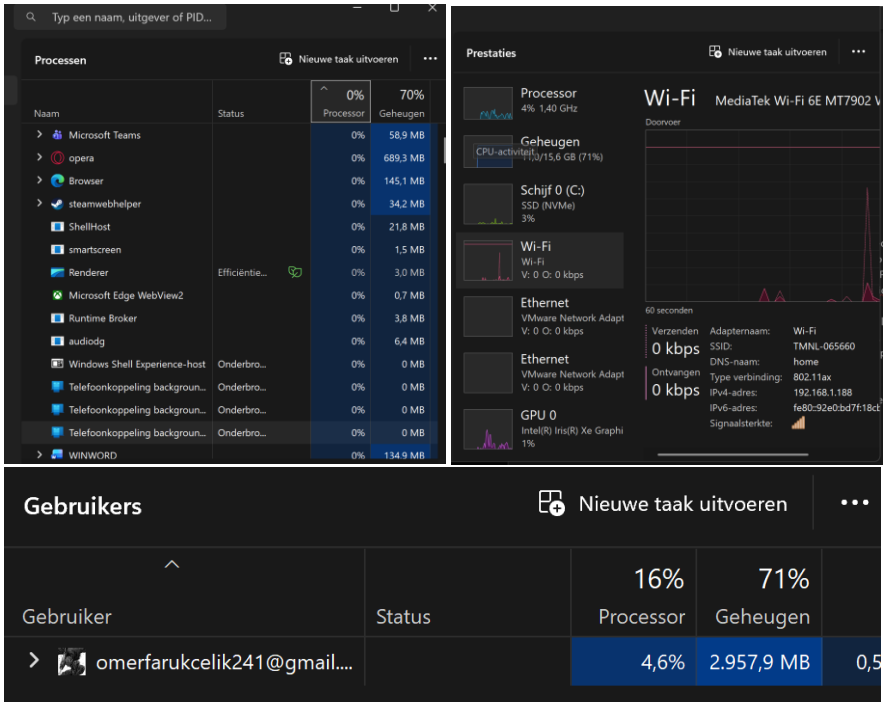
b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?



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?
Windows + p

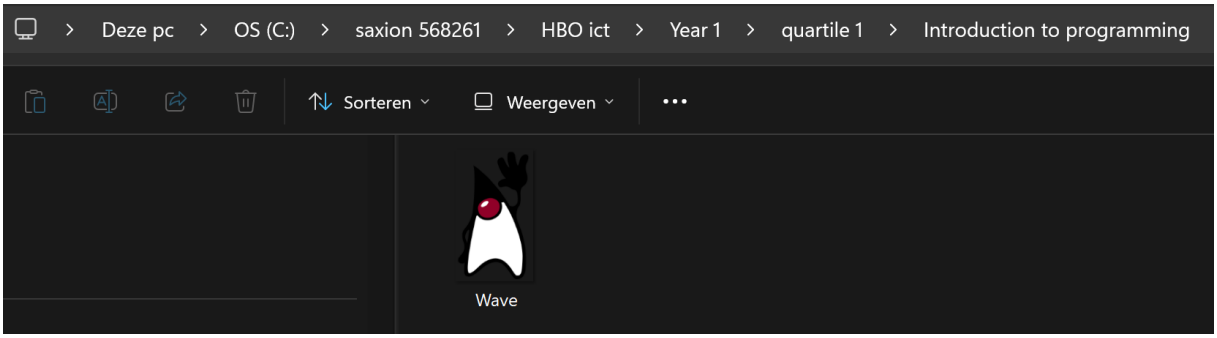
f) If you leave the classroom for a while and you leave your laptop behind, it is wise to lock the screen. Your Apps will continue to run in the background. So, for example, if you're waiting for a download that takes a while, lock the screen and get a cup of coffee. Which key combination do you use for this?

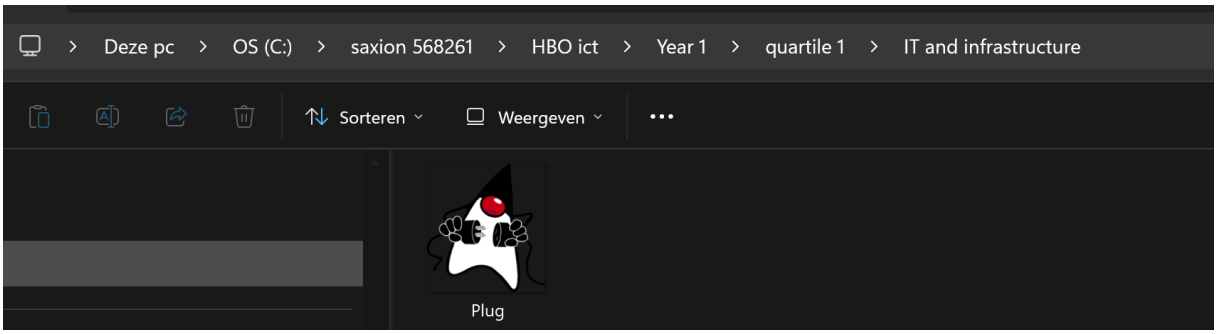
Windows + L

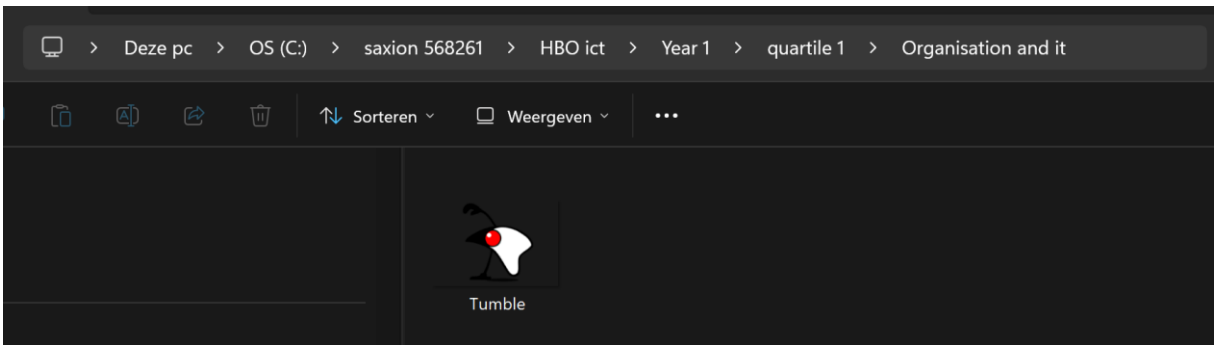
g) Open the Run screen with a key combination. On this screen, type CMD and press <enter>. Take a screenshot of this result and paste it into this template.

Working in the File Explorer

Relevant screenshots **copy** command:



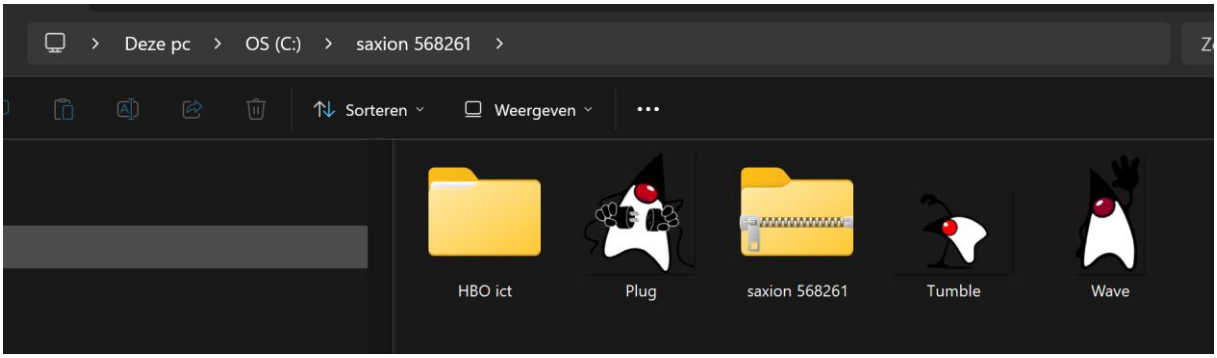




Relevant screenshots **tree** command:

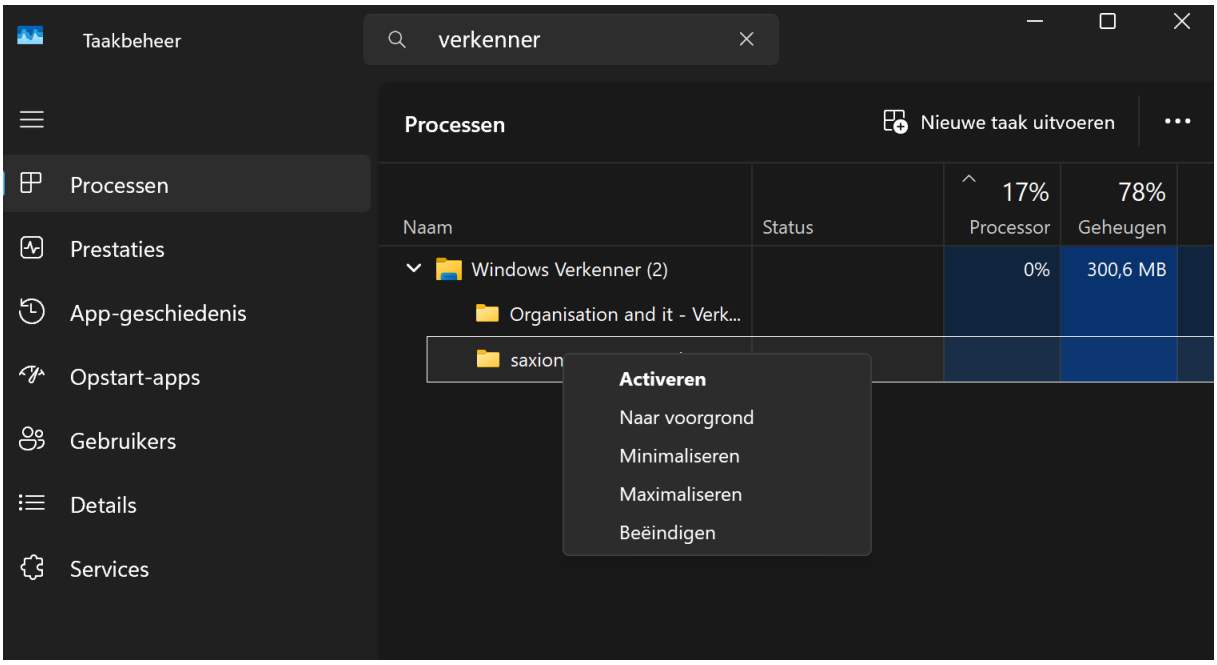
```
C:.
└───HBO ict
    ├───Year 1
    │   ├───quartile 1
    │   ├───quartile 2
    │   ├───quartile 3
    │   └───quartile 4
    ├───Year 2
    │   ├───quartile 1
    │   ├───quartile 2
    │   ├───quartile 3
    │   └───quartile 4
    ├───Year 3
    │   ├───quartile 1
    │   ├───quartile 2
    │   ├───quartile 3
    │   └───quartile 4
    └───Year 4
        ├───quartile 1
        ├───quartile 2
        ├───quartile 3
        └───quartile 4

C:\saxion 568261>echo %username%
omerf

C:\saxion 568261>
```

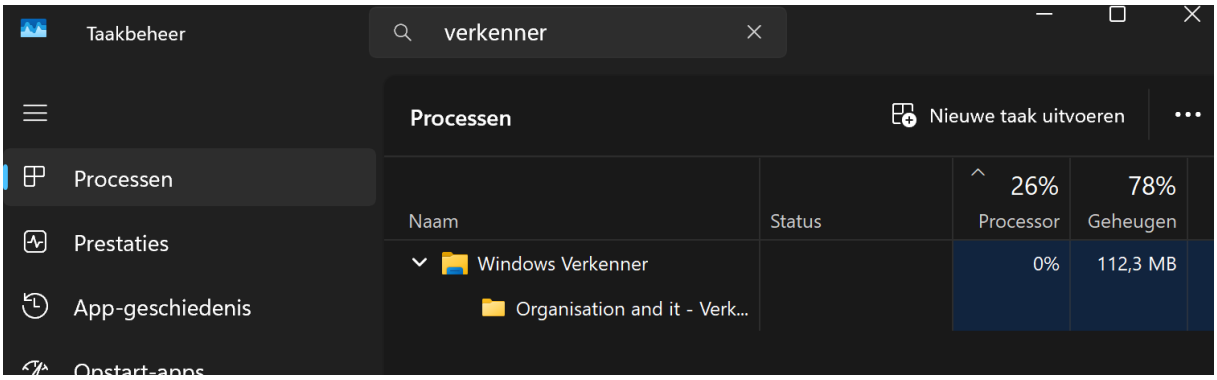
Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



Terminating Processes

Relevant Screenshots Task Manager Window:





Install Software

Relevant screenshots that the following software is installed with winget:

- WinSCP

```
C:\Windows\System32>winget install -e --id WinSCP.WinSCP
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...
Successfully installed
```

- Notepad++

```
C:\Windows\System32>winget install -e --id Notepad++.Notepad++
Found Notepad++ [Notepad++.Notepad++] Version 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/v8.9/npp
.8.9.Installer.x64.exe
  ████████████████████████████████  6.54 MB / 6.54 MB
Successfully verified installer hash
Starting package install...
Successfully installed
```

- 7zip

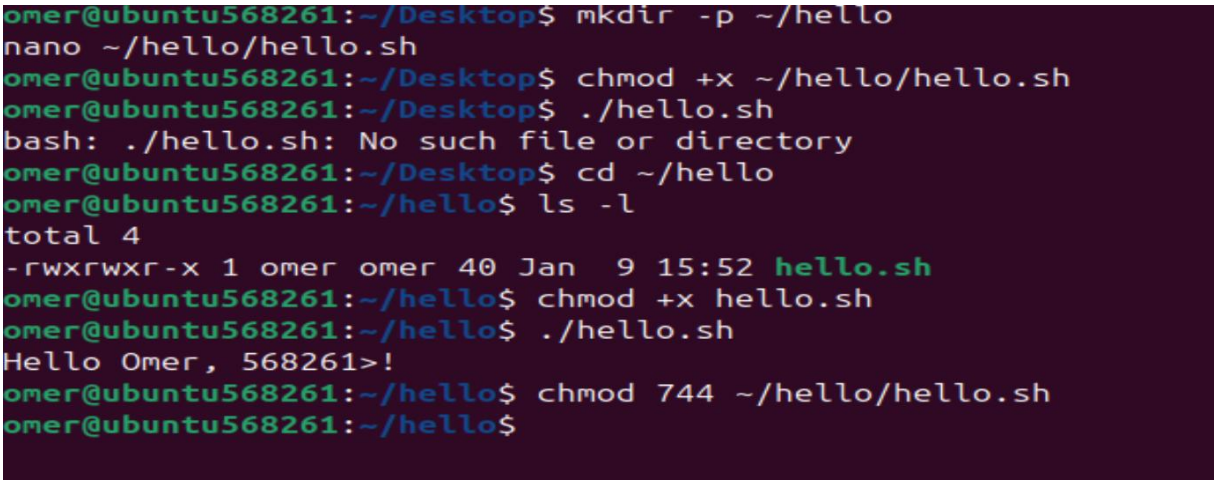
```
C:\Windows\System32>winget install -e --id 7zip.7zip
Found 7-Zip [7zip.7zip] Version 25.01
This application is licensed to you by its owner.
Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.
Downloading https://7-zip.org/a/7z2501-x64.exe
  ████████████████████████████████  1.56 MB / 1.56 MB
Successfully verified installer hash
Starting package install...
Successfully installed
```

Assignment 5.4: Working with Linux

Relevant screenshots + motivation

Assignment 5.5: Users and permissions on Linux

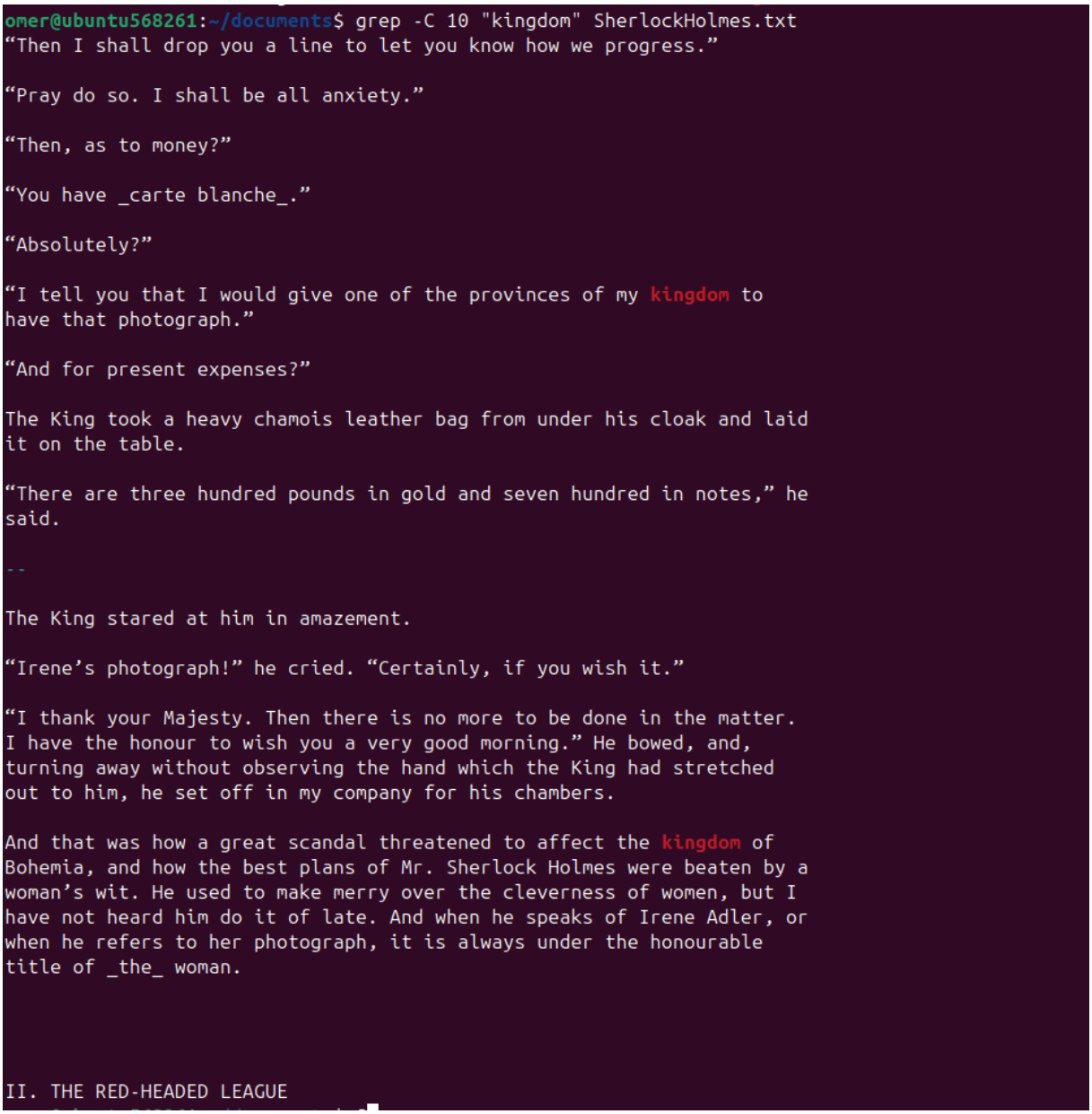
Relevant screenshots + motivation



By creating `hello.sh` and changing its permissions with `chmod`, I learned how to control who can execute or view a file. This helped me understand the importance of Linux file permissions and security in a multi-user environment.

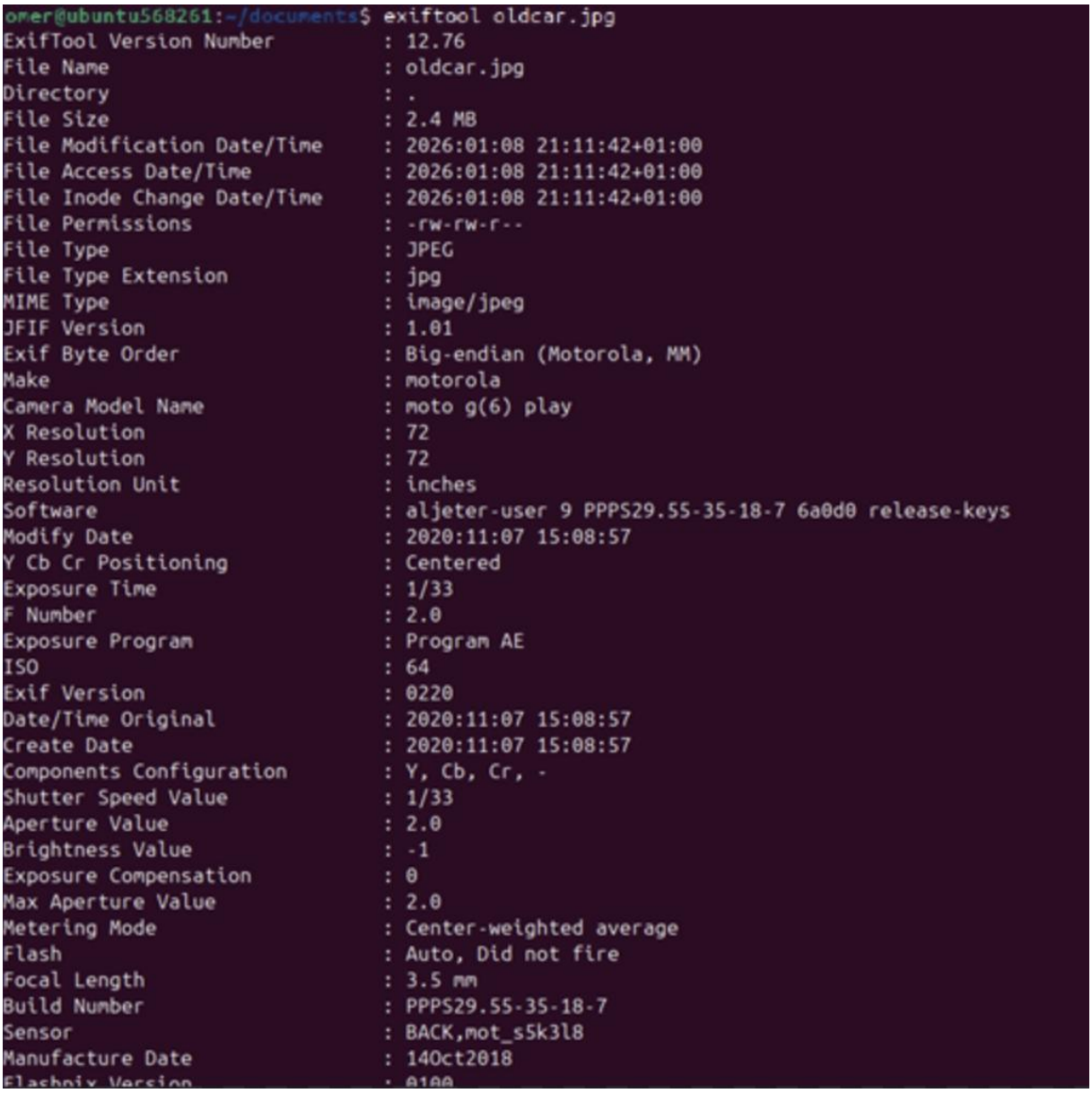
Assignment 5.6: View the contents of files

Relevant screenshots + motivation



Assignment 5.7: Digital forensics

Relevant screenshots + motivation



Assignment 5.8: Steganography

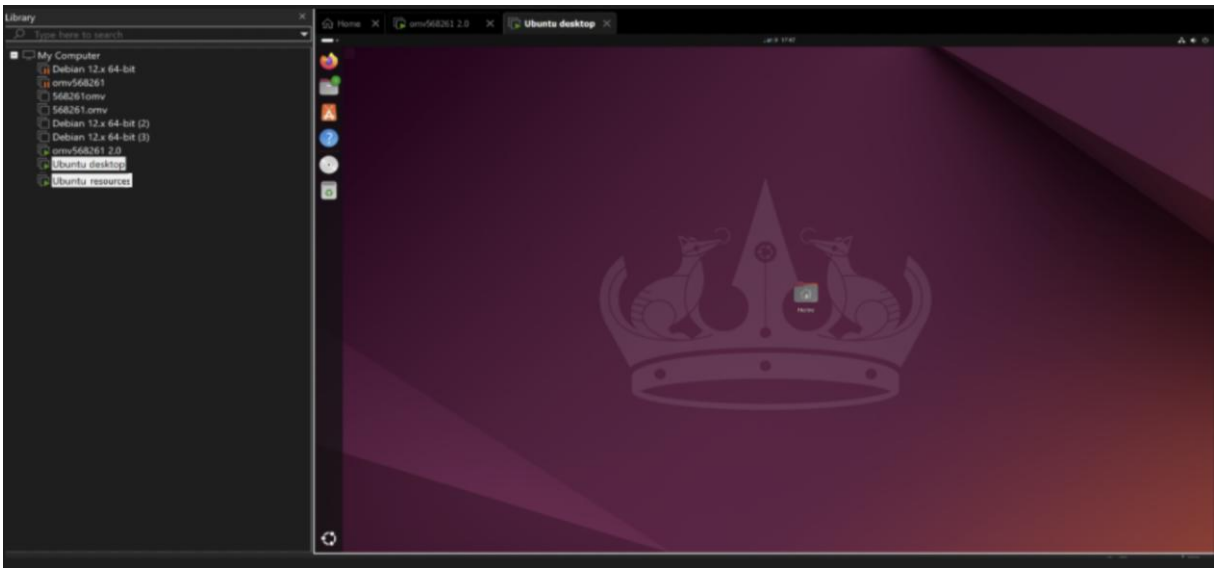
Relevant screenshots + motivation

```
omer@ubuntu568261: ~/Downloads$ cd
omer@ubuntu568261: ~$ cd Documents/
omer@ubuntu568261: ~/Documents$ ls
omer@ubuntu568261: ~/Documents$ steghide extract -sf appele2.
Enter passphrase:
wrote extracted datáto "message.txt".
omer@ubuntu568261: ~/Documents$ ls  oldcacr.jpg text.txt
Enter passphrase:
apple2.jpg code hello message.txt oldcar.jpg text.txt
omer@ubuntu568261: ~/Documents$ cat message.txt
Hello class.
You have almost completed Week 5.
```

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.



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