Template Week 5 – Operating Systems

Student number: 569681

Assignment 5.1: Unix-like

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

UNIX is the original OS made for the bigger servers in the starting years of computer development (1969). Unix like operating systems fulfil the Single Unix specifications

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 and Dennis Ritchie developed the UNIX operating system.

Bill Joy contributed to the development of the UNIX operating system and made the VI text editor.

Richard Stallman is responsible for the development of the GCC C compiler and the GNU library.

Linus Torvaldus made the Linux operating system using the GNU C library and UNIX architecture.

c) What is the philosophy of the GNU movement?

That software should be free and available to everyone.

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

Ubuntu is an open source free operating system, which means that it conforms to the philosophy of software being free and widely available (even though Richard Stallman named it spyware because of collaboration with Microsoft).

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

WSL is used to run a process of Linux on a Windows machine. It runs as a process in a docker container.

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

All these systems are based on the Linux operating system.

Assignment 5.2: Supercomputers and game consoles

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

Early Beginnings (1940s-1950s): The first supercomputers emerged in the 1940s, with the advent of machines like the ENIAC, designed for military and scientific calculations. These systems used vacuum tubes and were massive and slow by modern standards.

1960s - Seymour Cray and CDC: In the 1960s, Seymour Cray developed the CDC 6600, often recognized as the first true supercomputer. It introduced parallel processing and outperformed all other computers of its time.

1970s-1980s - Vector Processing: Cray continued innovating with systems like the Cray-1, which used vector processing to handle large datasets efficiently, making it ideal for weather forecasting and scientific simulations.

1990s - Massively Parallel Systems: Supercomputers began using massively parallel processing (MPP), integrating thousands of processors to achieve unprecedented speeds. This era also saw the rise of cluster-based systems.

2000s-Present - Petascale and Beyond: Modern supercomputers utilize millions of processors and GPUs. They achieve petascale and now exascale performance, enabling breakthroughs in fields like AI, climate modeling, and genomics.

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 PlayStation3 cluster is a number of PlayStation3 consoles sewn together to work in unison. The best example for this is a Condor Cluster, made by the AFRL in United States. At its time, it was the 33rd largest supercomputer in the world.

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?

This operating system uses the Oracle Linux for ARM.

d) Does Oracle's Raspberry Pi supercomputer appear in the list of the 500 fastest supercomputers in the world? Make a logical decision for this, without going through the entire list.
https://www.top500.org/lists/top500/list/2023/06/

Considering the hardware used in other top-notch supercomputers, a raspberry pi cluster wouldn't make the list.

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?

The architecture used in the newest game consoles is x86. The operating systems that power them are mostly based on FreeBSD.

Assignment 5.3: Working with Windows

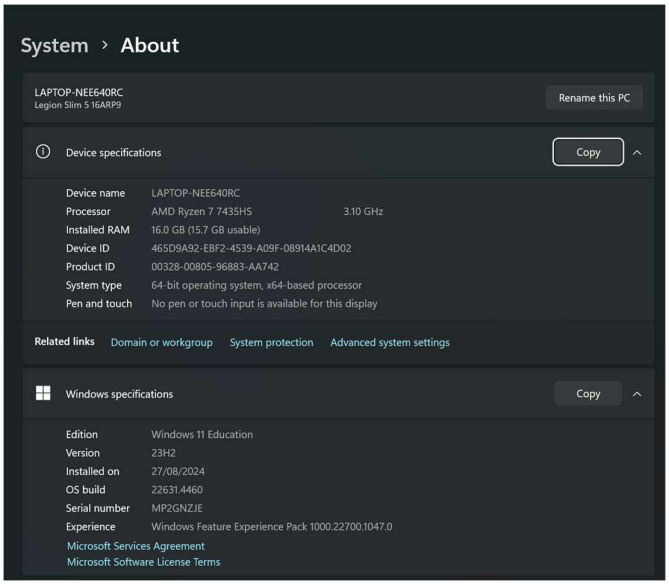
Take relevant screenshots of the assignments below

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.

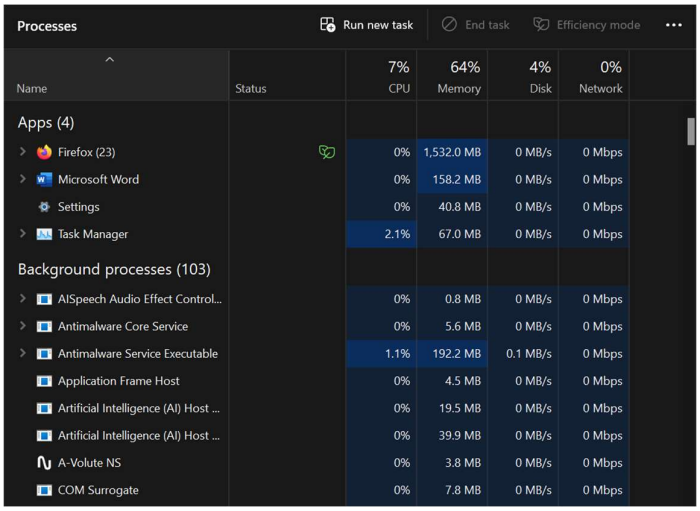
b) The file explorer can be opened with ⊞ + E, Which key combination could you also use?

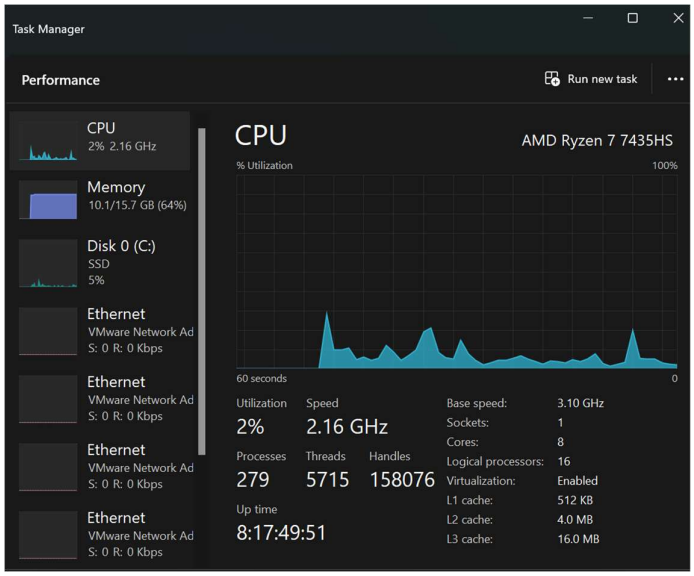
There are multiple answers possible for this question.
If your system has a file explorer on the taskbar, you can use windows key + t to navigate to the file explorer and enter to access it.

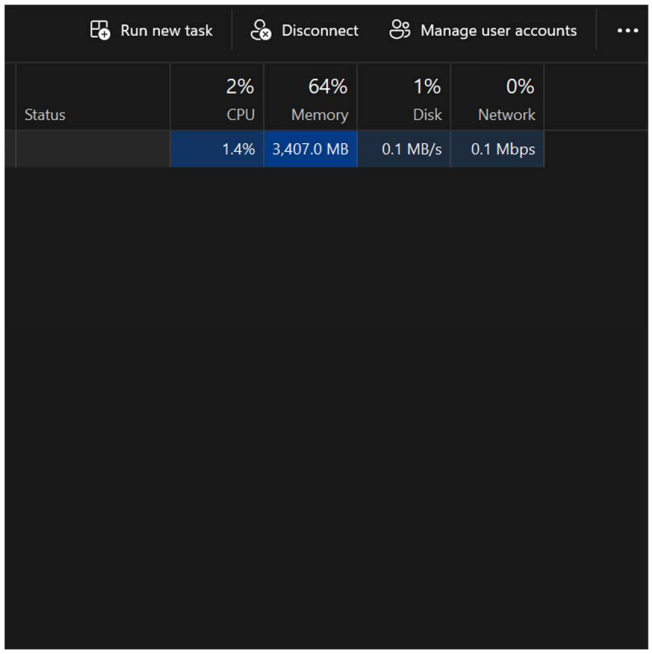
c) Open the system properties with a ⊞ key combination, take a screenshot of the open screen. Paste this screenshot into this template.



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.







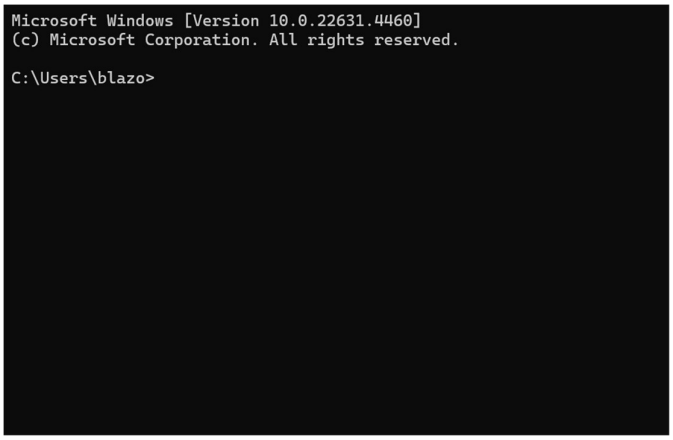
e) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector,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

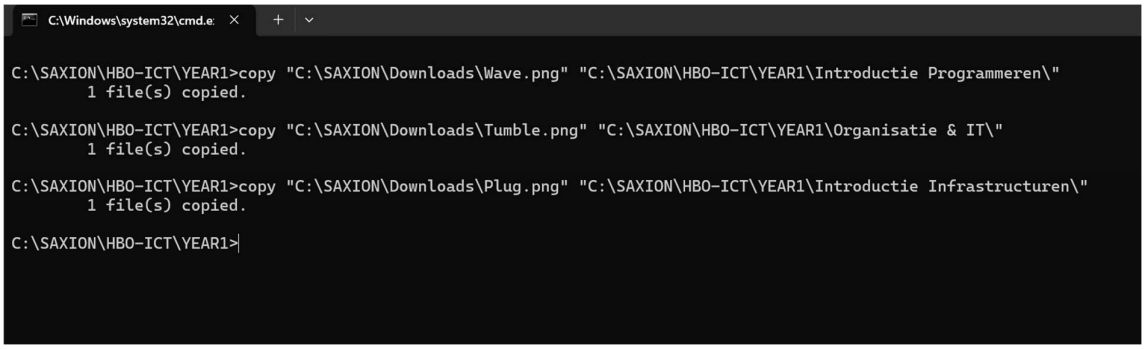
Windows key + L

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.

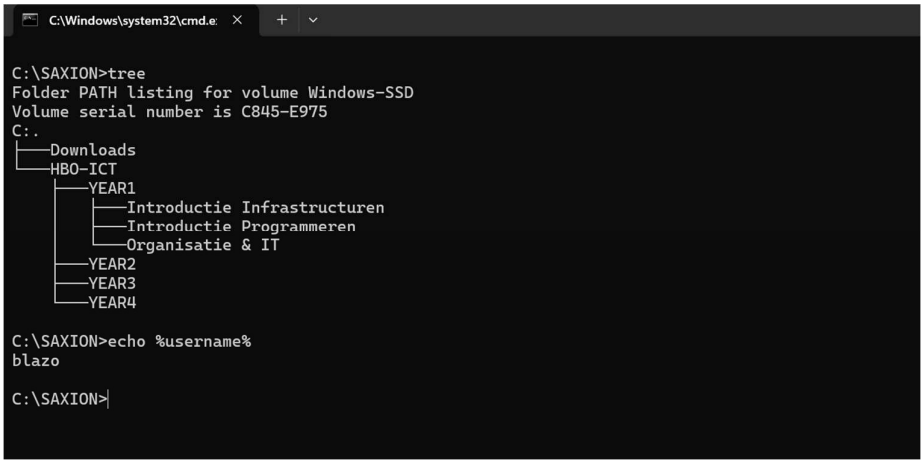


Working in the File Explorer

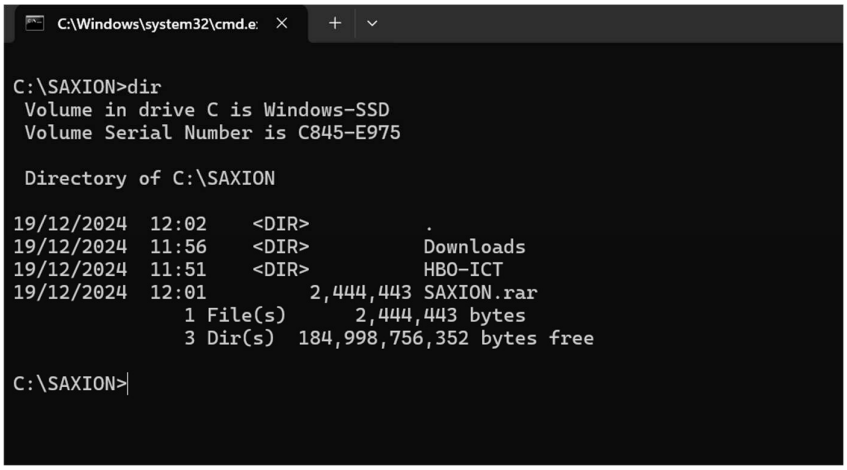
Relevant screenshots **copy** command:



Relevant screenshots **tree** command:

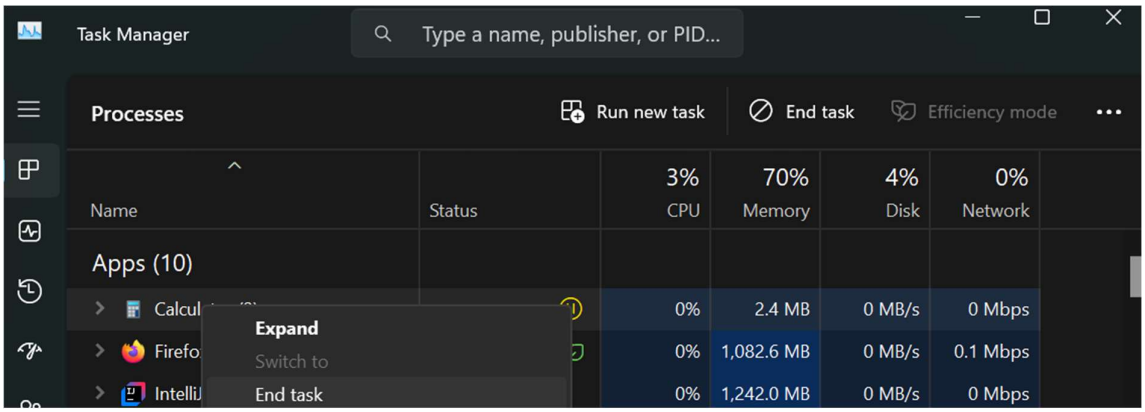


Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



Terminating Processes

Relevant Screenshots Task Manager Window:



Install Software

Relevant screenshots that the following software is installed:

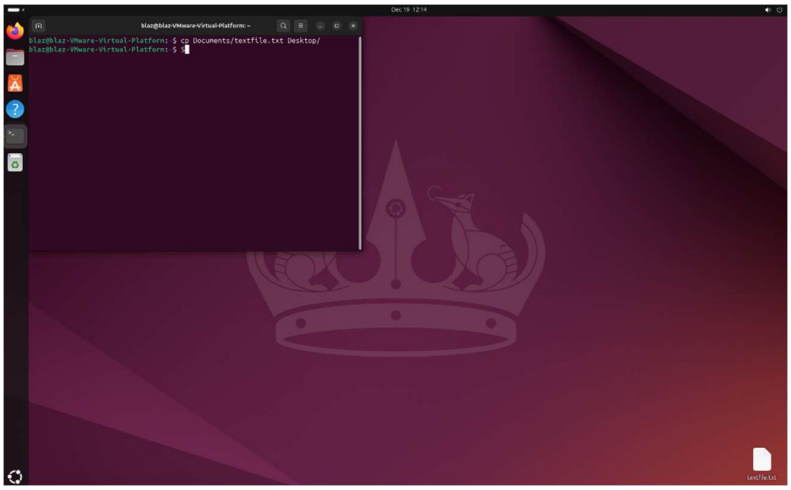
- WinSCP
- Notepad++
- 7zip

```
C:\Windows\system32\cmd.e
C:\>winget install WinSCP.WinSCP
Found WinSCP [WinSCP.WinSCP] Version 6.3.6
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/6.3.6/WinSCP-6.3.6-Setup.exe/download
  ██████████████████████████████  11.0 MB / 11.0 MB
Successfully verified installer hash
Starting package install...
Successfully installed

C:\>winget install --id Notepad++.Notepad++ -e
Found Notepad++ [Notepad++.Notepad++] Version 8.7.4
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/v8.7.4/npp.8.7.4.Installer.x64.exe
  ██████████████████████████████  6.34 MB / 6.34 MB
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator, expect a prompt.
Successfully installed

C:\>winget install --id 7zip.7zip -e
Found an existing package already installed. Trying to upgrade the installed package...
Found 7-Zip [7zip.7zip] Version 24.09
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/7z2409-x64.exe
  ██████████████████████████████  1.56 MB / 1.56 MB
Successfully verified installer hash
Starting package install...
The installer will request to run as administrator, expect a prompt.
Successfully installed

C:\>
```

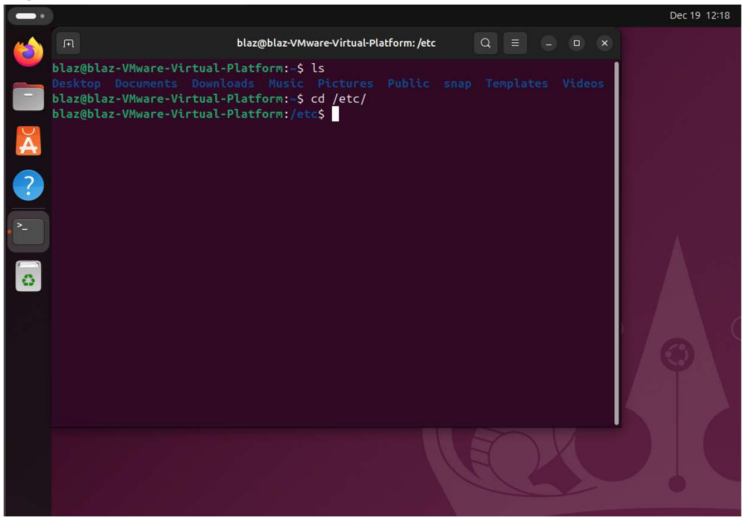
Assignment 5.4: Working with Linux

Relevant screenshots + motivation

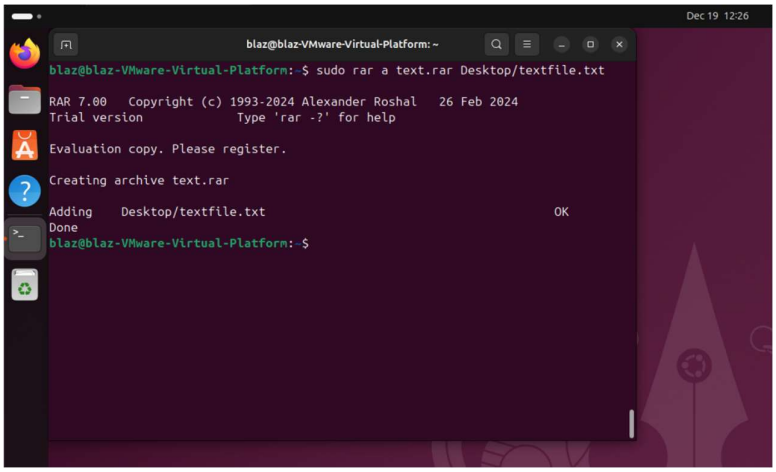
- Copying the file:



- Navigating to the etc folder:

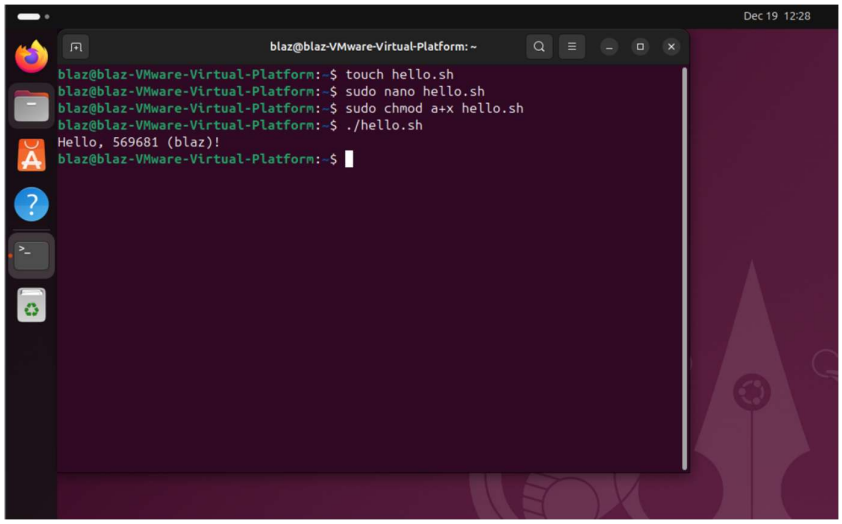


- Compressing files:
  For compressing the files into .rar you first need to install the rar programme with sudo apt install rar. When rar is installed you can use sudo rar a <rar filename> <filename> to compress it.



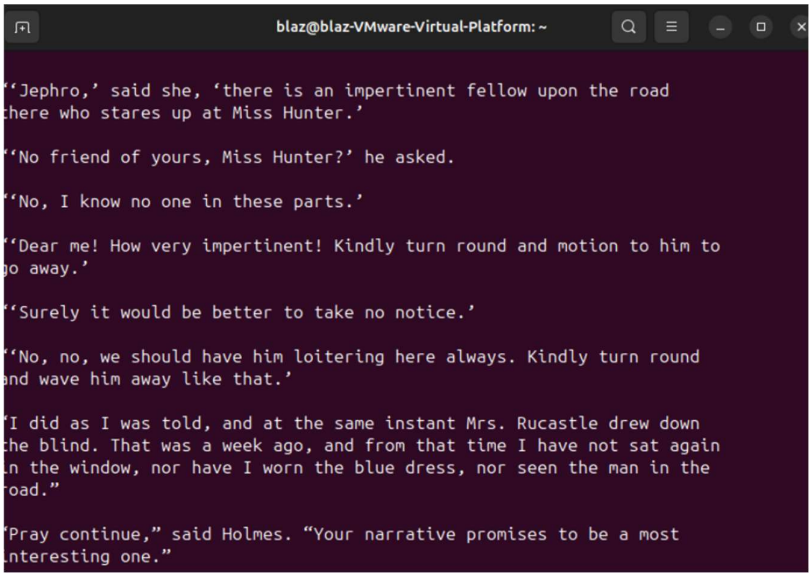
Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation



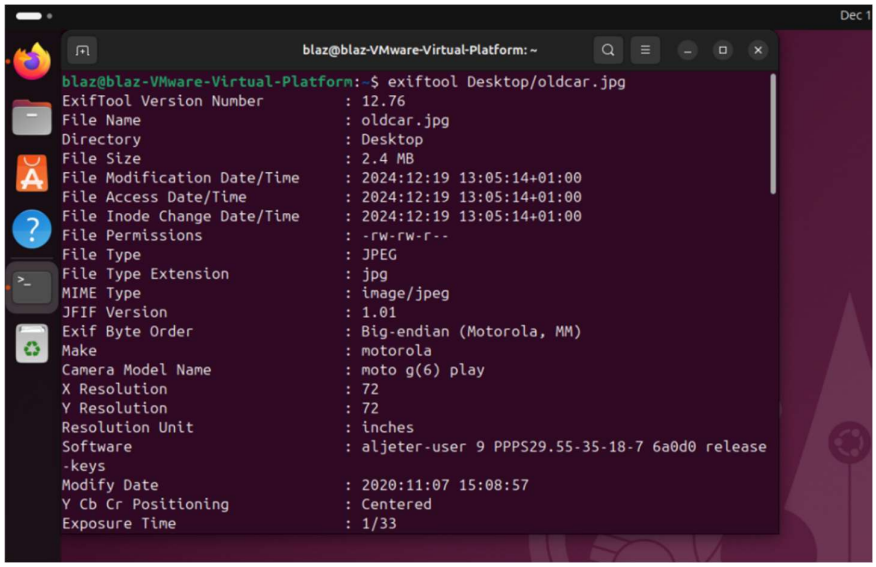
Assignment 5.6: View the contents of files

Relevant screenshots + motivation



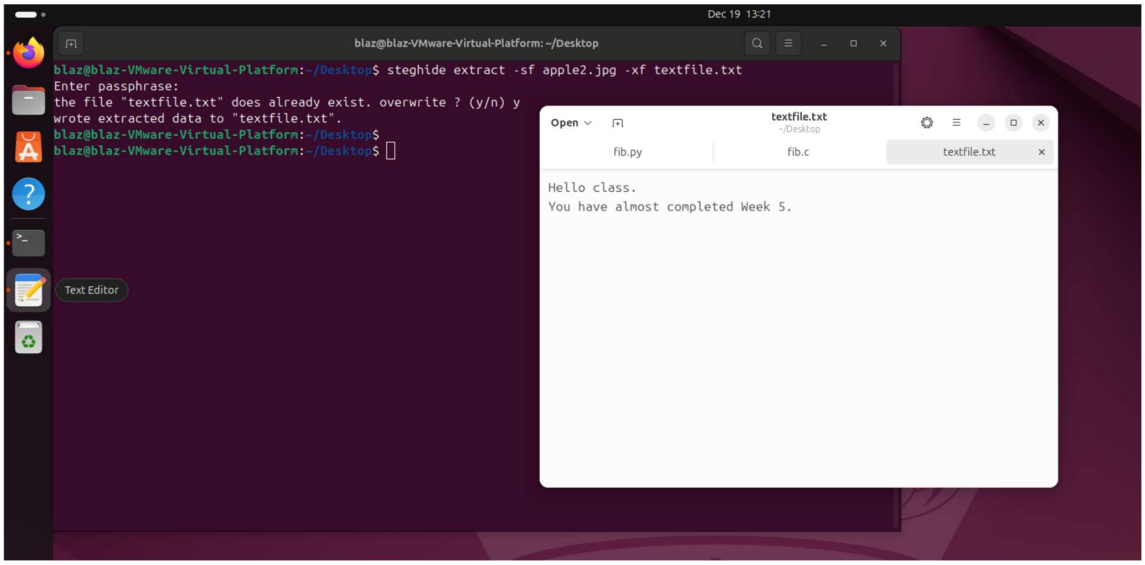
Assignment 5.7: Digital forensics

Relevant screenshots + motivation



Assignment 5.8: Steganography

Relevant screenshots + motivation



Bonus point assignment – week 5

Make relevant screenshots + motivation:

- Proof that the FOG server is installed and is functioning correctly.
- Proof that the FOG server has made a back-up of the Windows11 VM or the Ubuntu 24.04 Desktop VM.