

Template Week 5 – Operating Systems

Student number: 560830

Assignment 5.1: Unix-like

- a) Find out what the difference is between UNIX and unix-like operating systems?
- UNIX is a term specifically for the system developed by AT&T. Unix-like operating systems like Linux mimic the functionalities, and are open-source. UNIX is meant for portability, UNIX-like is focused for customizability.
- 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.

People	Contributions
Ken Thompson	Co-creator of UNIX, shaped B; a precursor to C.
Dennis Ritchie	Co-creator of UNIX, developed C.
Bill Joy	Co-founder of Sun Microsystems and made BSD UNIX. Helped in early development of the TCP protocol.
Richard Stallman	Creator of GNU and an early adopter and advocate for open-source / free software.
Linus Torvalds	Creator of the Linux kernel, and initially starting Git to aid in the development of Linux.

- c) What is the philosophy of the GNU movement?
- The GNU movement has a few major philosophies:
 1. Allowing users to run software under the license for any purpose.
 2. Letting users modify the software.
 3. Allowing users to distribute modified copies.
 4. Letting users redistribute copies of the software.
- d) Does Ubuntu as a Linux operating system conform to the philosophy of the GNU movement?
Please explain your answer.

Yes, it's built on the Linux kernel which is open-source, and Ubuntu itself is open-source.

- e) Find out what is the Windows Subsystem for Linux?
The WSL is a tool to run Linux commands without a full virtual machine.

- f) Find out, which operating system family belongs to Android, iOS and ChromeOS?
Android and ChromeOS are from the Linux family, iOS is Unix-Like.

Assignment 5.2: Supercomputers and gameconsoles

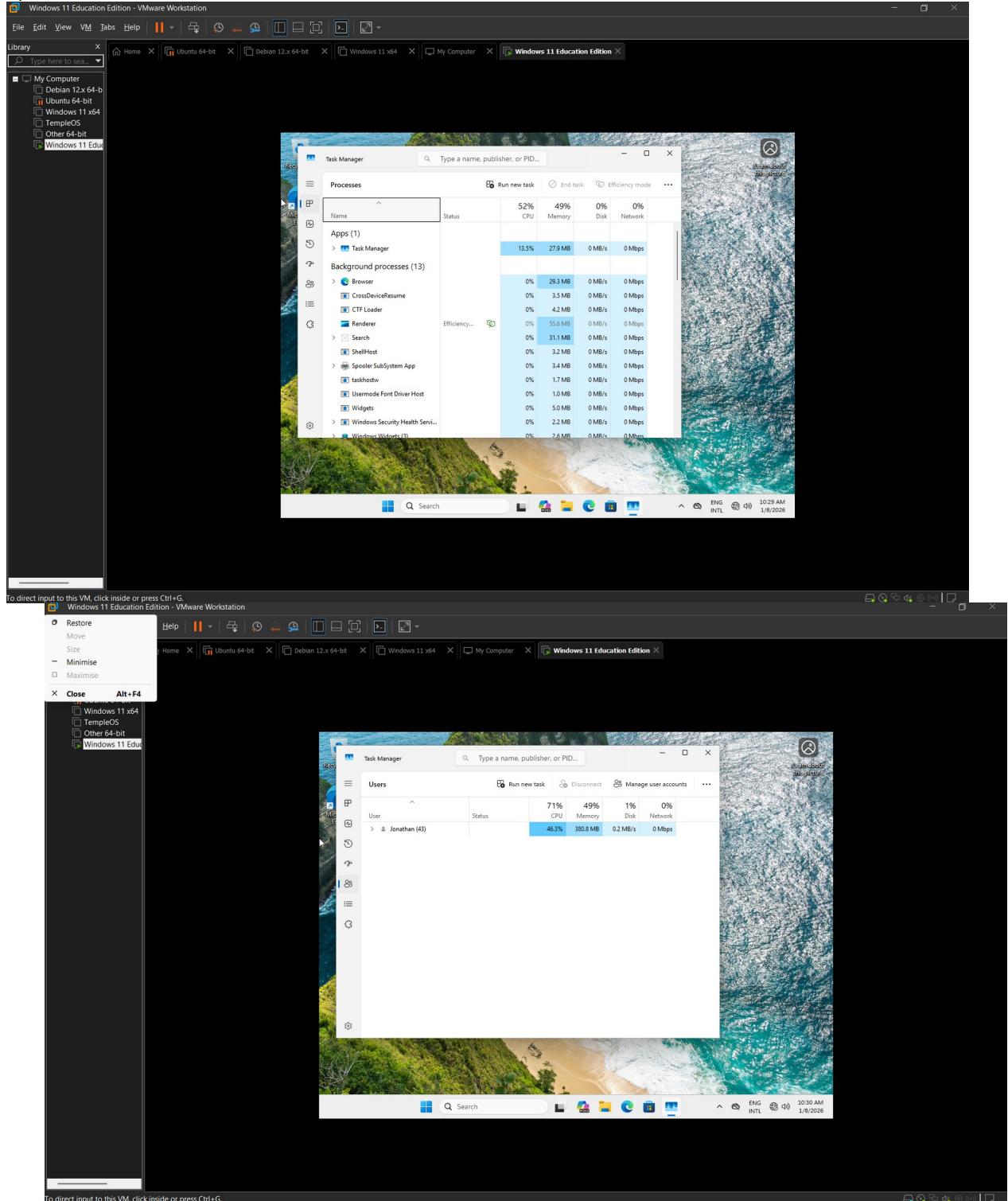
- a) Research on this site what supercomputers are used for and write a short summary of it:
<https://www.computerhistory.org/timeline/search/?q=Supercomputer>
- Supercomputers are heavy-duty computers used for advanced computing tasks, like physics-based simulations, AI, cryptography, and working with large datasets.
- 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?
- Because of the IBM Cell processor, PS3's were very well-suited for heavy tasks such as astrophysics simulations, protein folding and cryptography purposes.
- 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's own Linux distribution meant for enterprise usage, which is based off Red Hat Enterprise Linux, or RHEL.
- 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 top 500 are very, very fast. The raspberry pi's lack the performance.
- 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?
- Both use a Zen 2 AMD Ryzen CPU.
 - The PS5 runs a Unix-like proprietary OS.
 - The Series X runs a DirectX-optimized windows version.

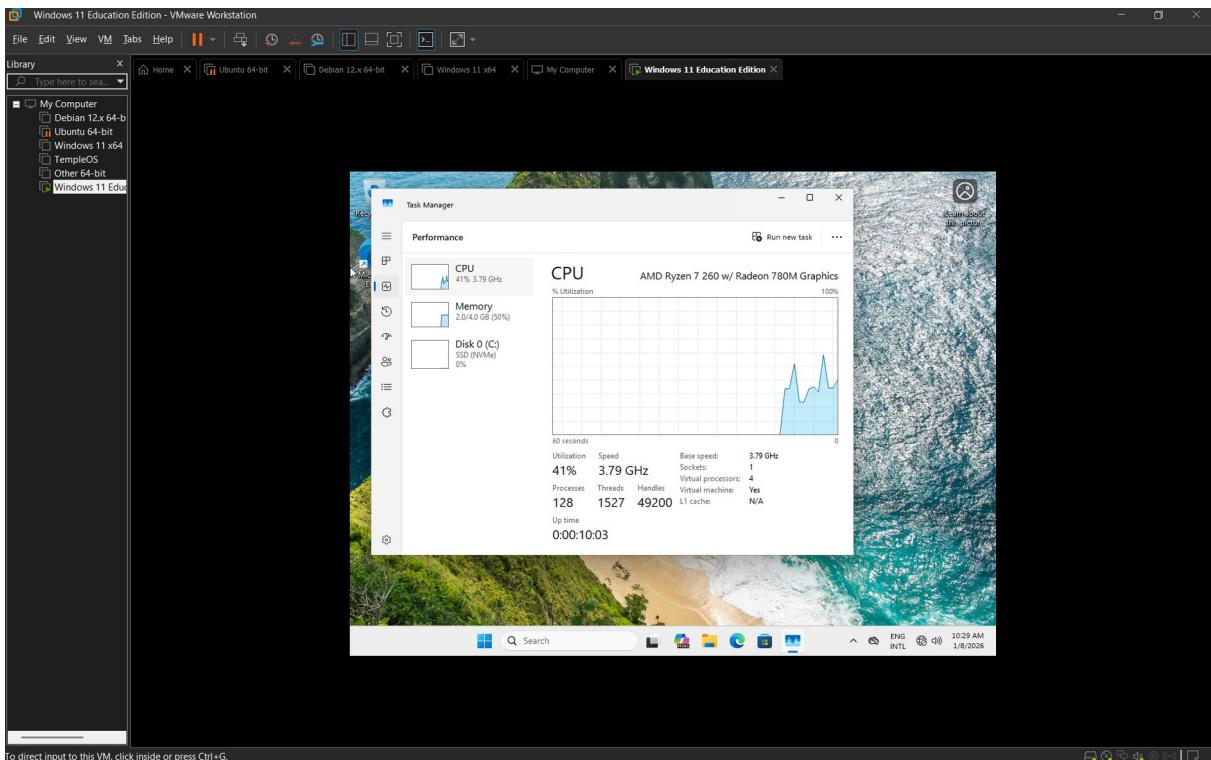
Assignment 5.3: Working with Windows

Take relevant screenshots of the assignments below

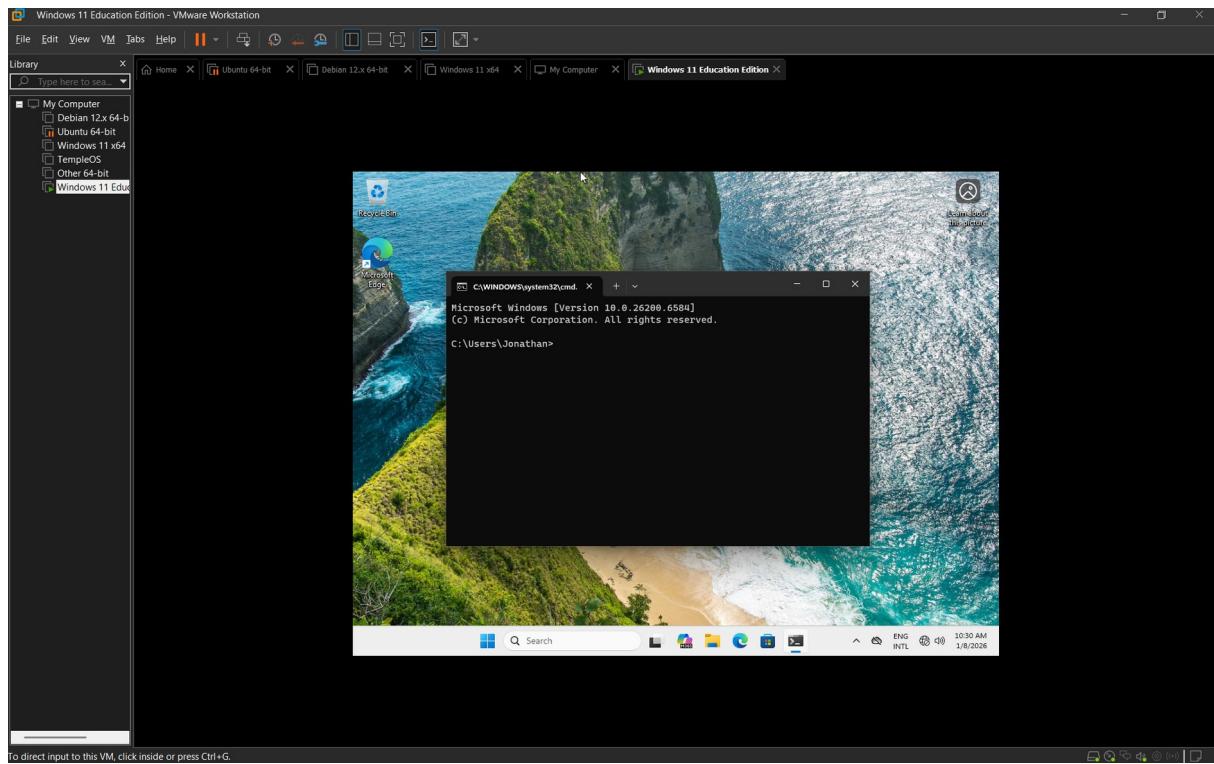
- a) Practice for about 10 minutes with the  keyboard shortcuts combinations, skip the general shortcuts in this exercise. Take a look at which screens are opened.
- b) The file explorer can be opened with  + E, Which key combination could you also use?
- c) Open the system properties with a  key combination,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



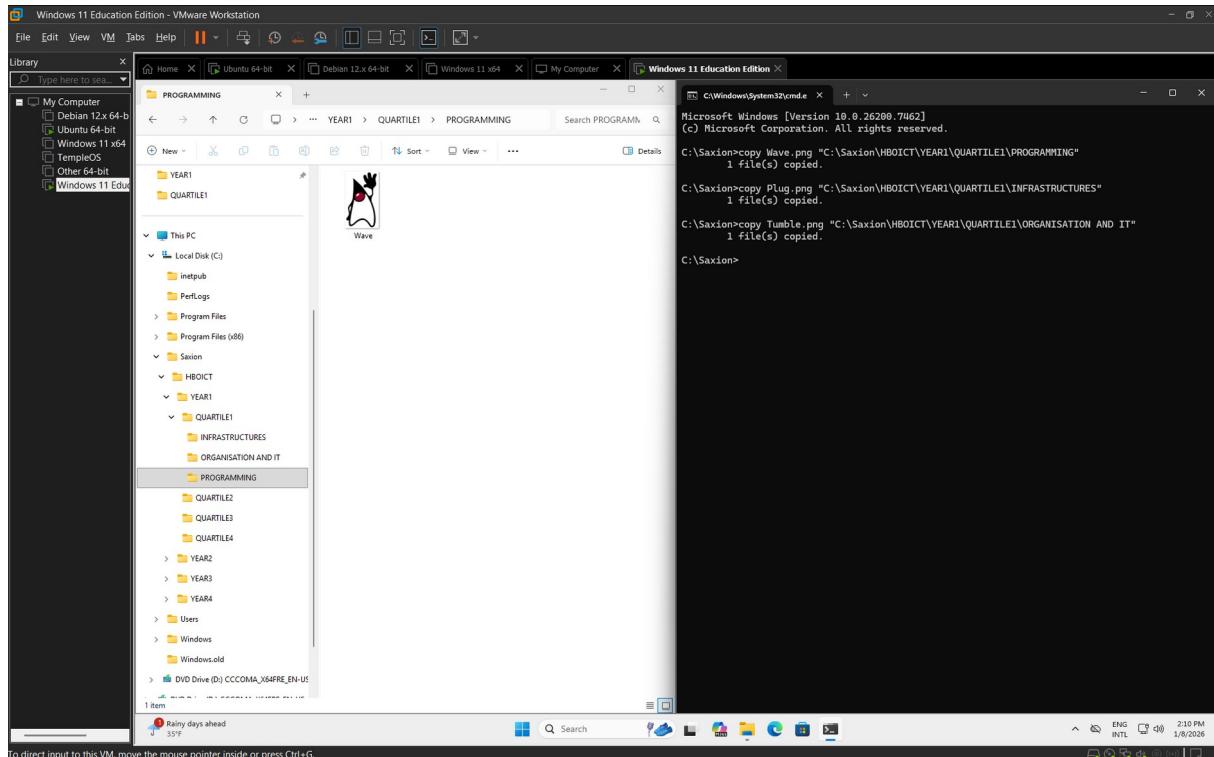


- f) If you're giving a PowerPoint presentation and you connect your laptop to a projector, Windows can use the projector as a second screen. For example, you may have Outlook open on your first screen that you don't show over the projector, while the PowerPoint presentation is displayed on the projector, or the second screen. Which key combination should you use for this?
- Windows key + P quickly opens up the "Projection" menu.
- g) 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 locks the screen instantly.
- h) 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.

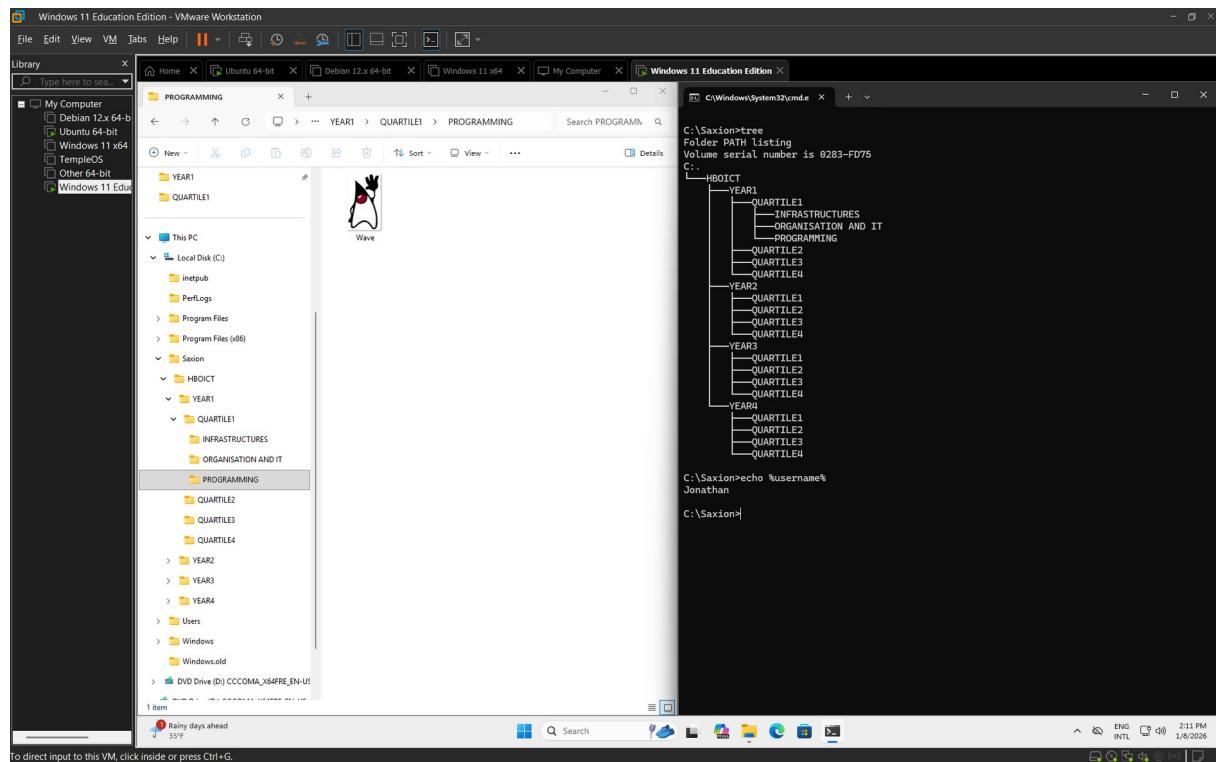


Working in the File Explorer

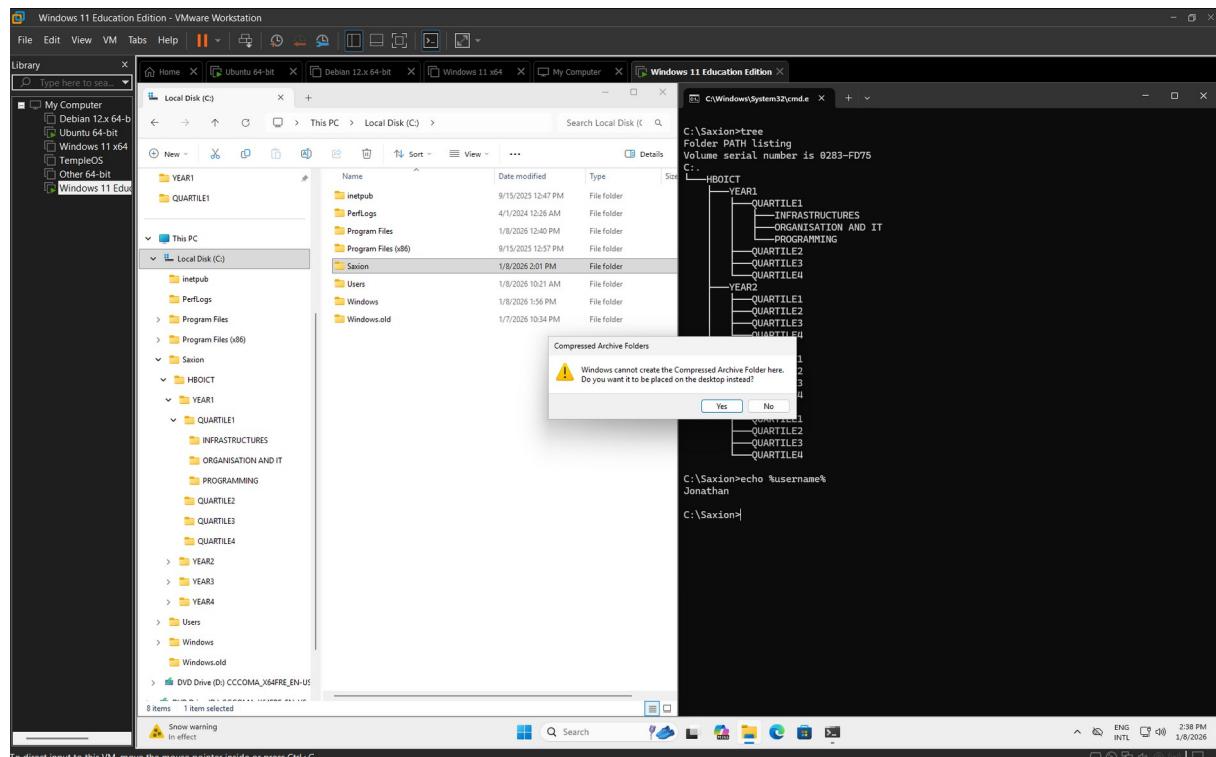
Relevant screenshots **copy** command:



Relevant screenshots **tree** command:



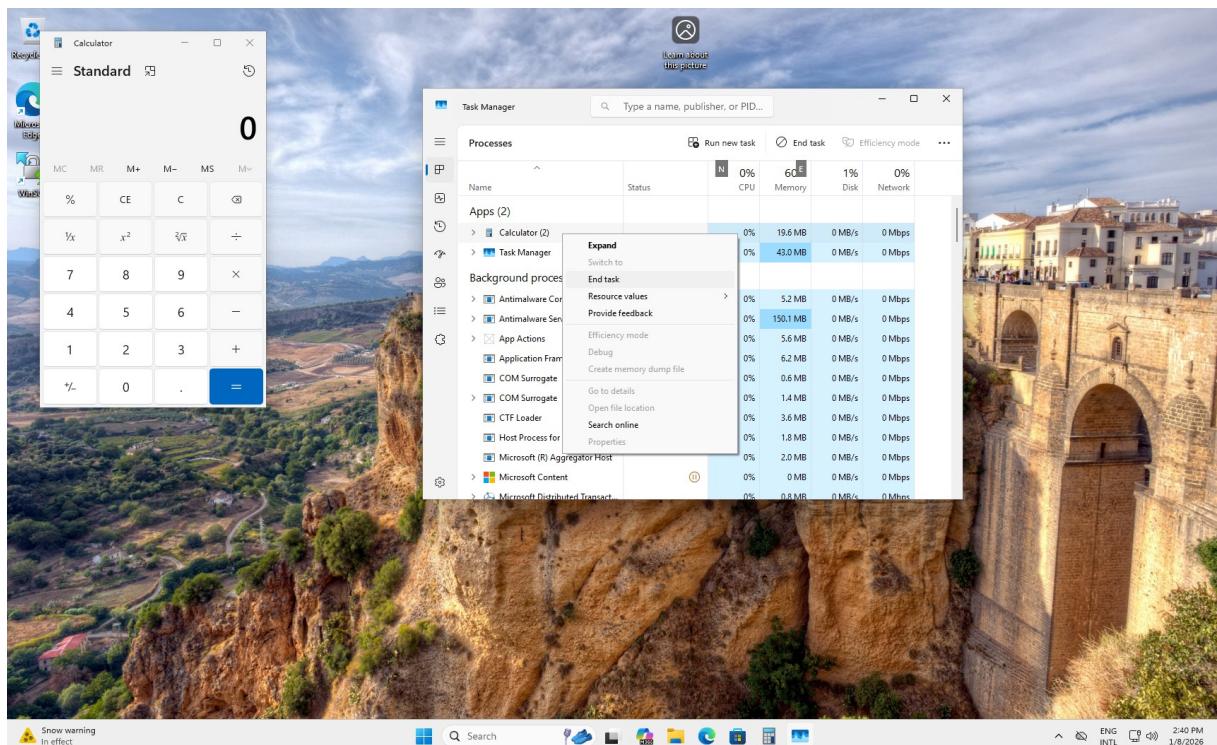
Relevant screenshots in the file explorer of the folder c:\Saxion + created zip file.



(ZIP archives cannot be made in the C: drive.)

Terminating Processes

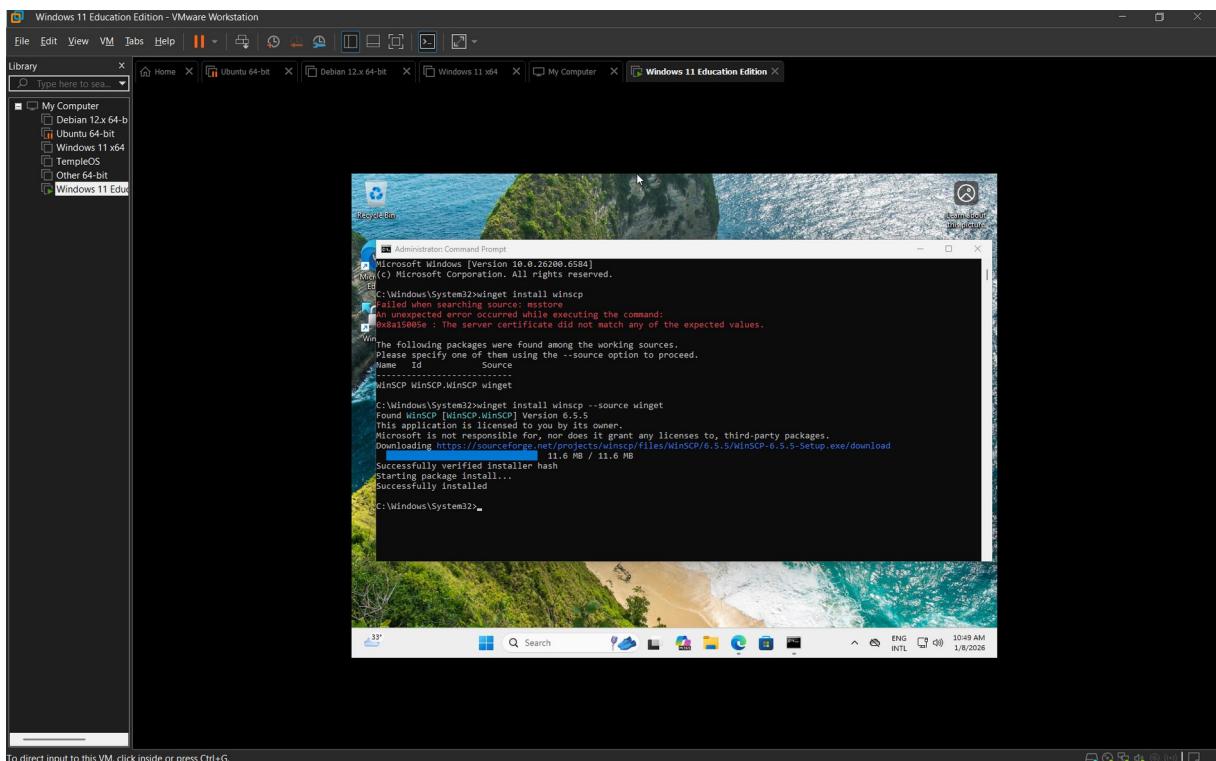
Relevant Screenshots Task Manager Window:



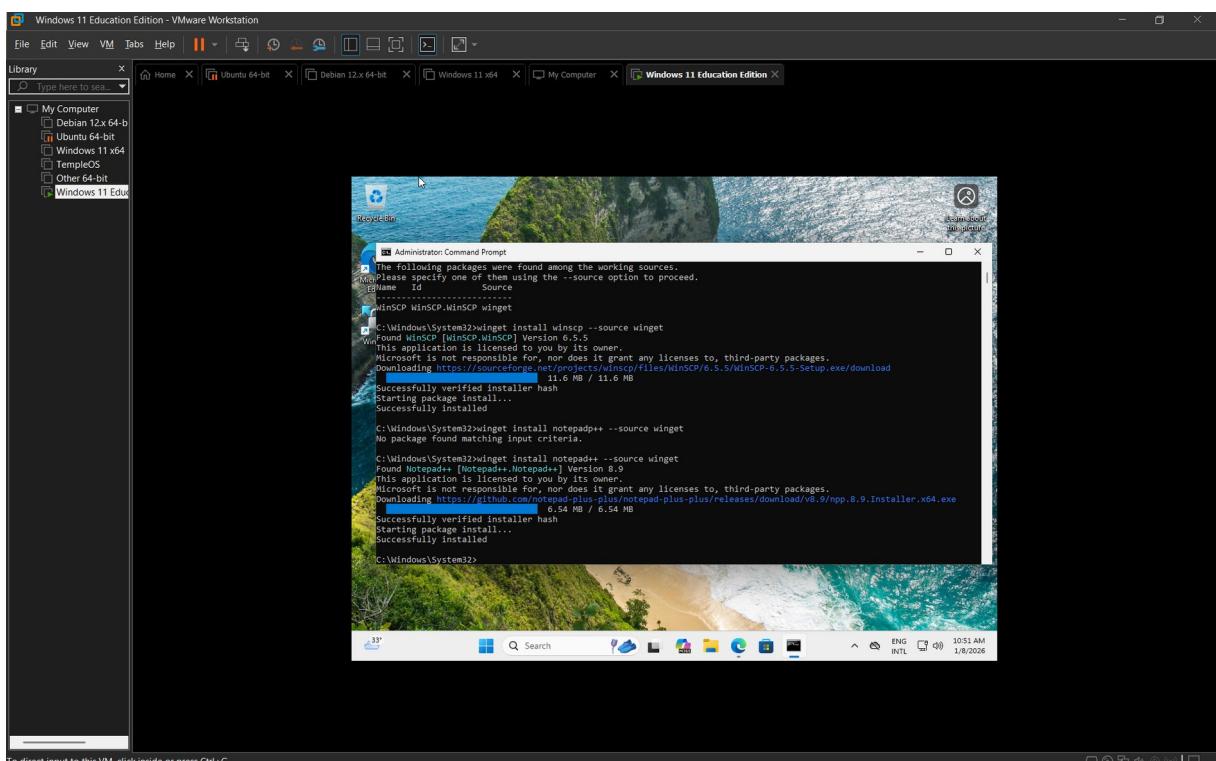
Install Software

Relevant screenshots that the following software is installed with winget:

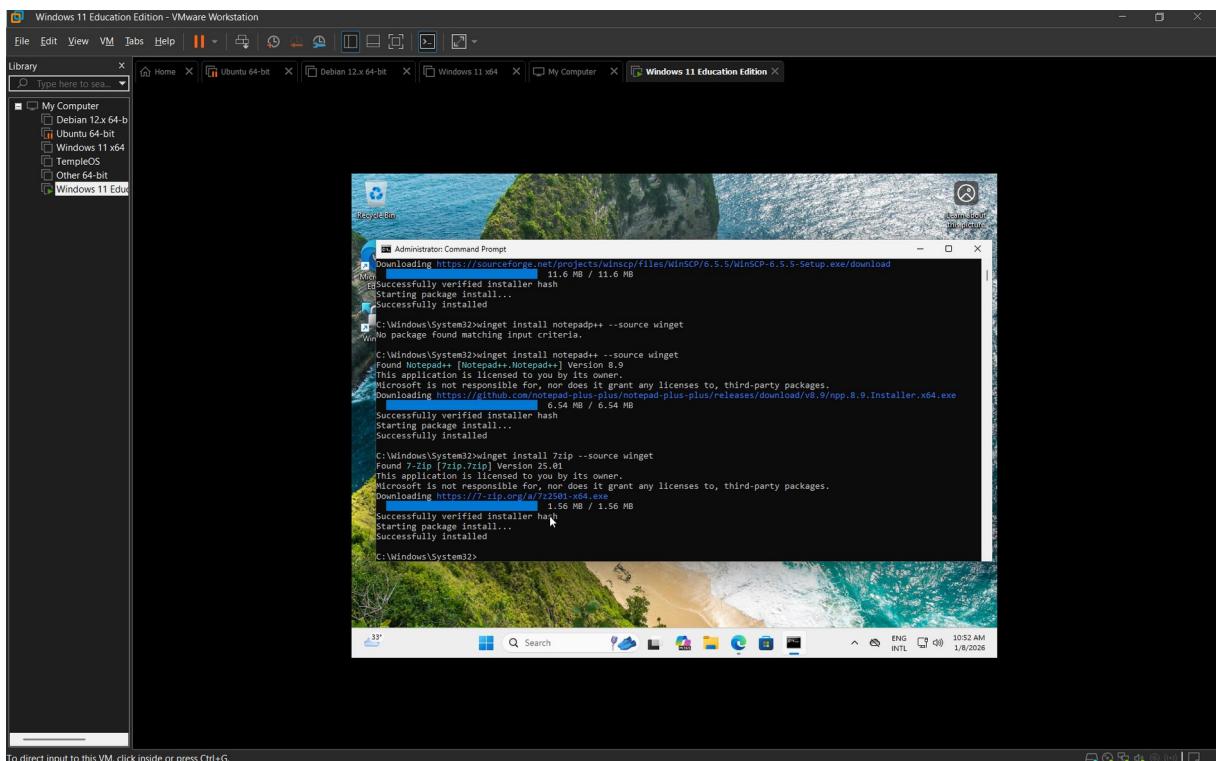
● WinSCP



● Notepad++

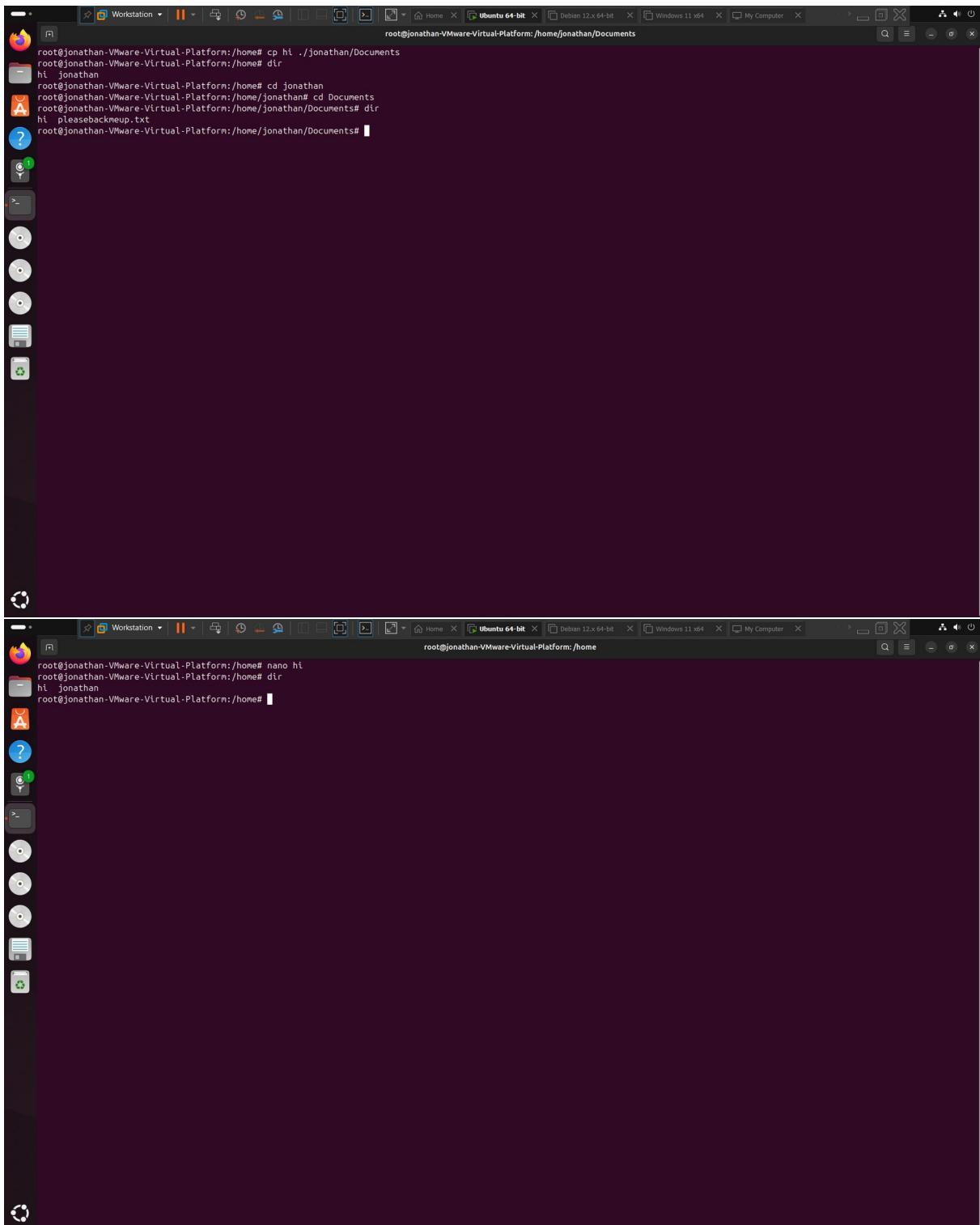


● 7zip



Assignment 5.4: Working with Linux

Relevant screenshots + motivation



The image contains two vertically stacked screenshots of a Linux desktop environment, likely Ubuntu, showing a terminal window.

Screenshot 1: The terminal window shows the following command sequence:

```
root@jonathan-VMware-Virtual-Platform:/home# cp hi ..;/jonathan/Documents
root@jonathan-VMware-Virtual-Platform:/home# dir
hi jonathan
root@jonathan-VMware-Virtual-Platform:/home/jonathan# cd Documents
root@jonathan-VMware-Virtual-Platform:/home/jonathan/Documents# dir
hi pleasebackmeup.txt
root@jonathan-VMware-Virtual-Platform:/home/jonathan/Documents#
```

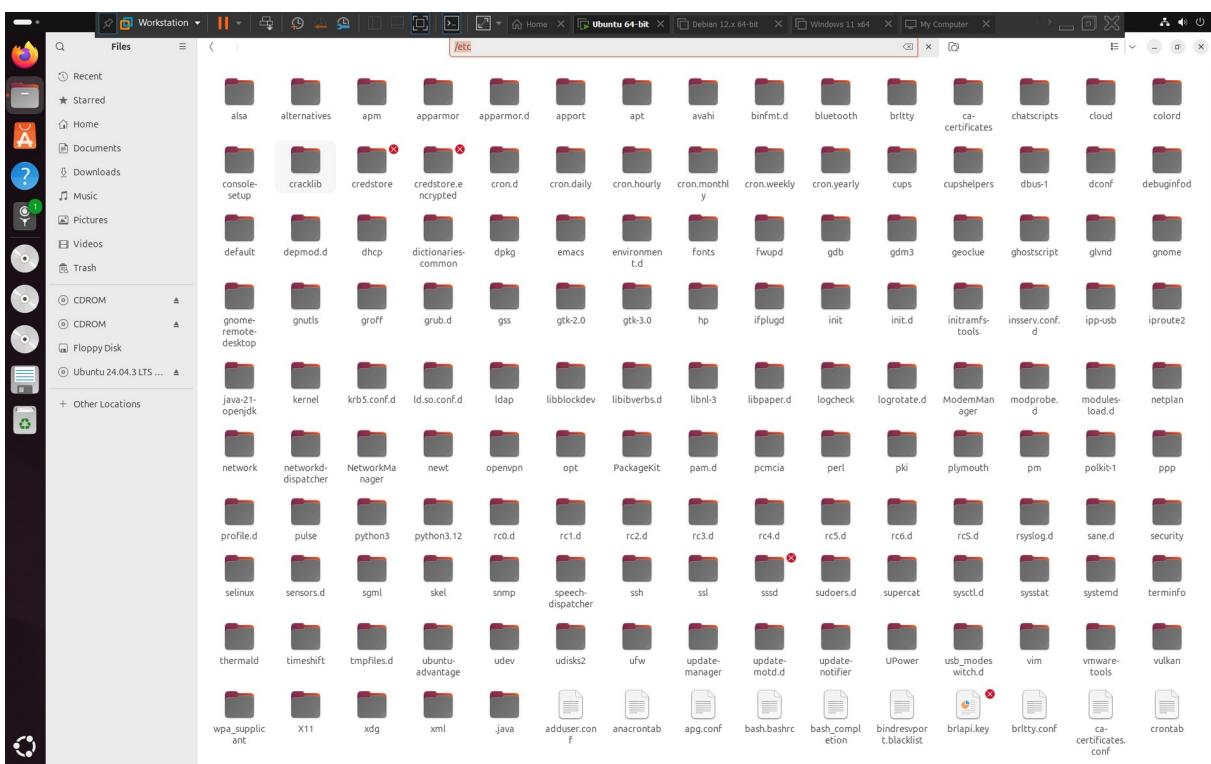
Screenshot 2: The terminal window shows the following command sequence:

```
root@jonathan-VMware-Virtual-Platform:/home# nano hi
root@jonathan-VMware-Virtual-Platform:/home# dir
hi jonathan
root@jonathan-VMware-Virtual-Platform:/home#
```

```

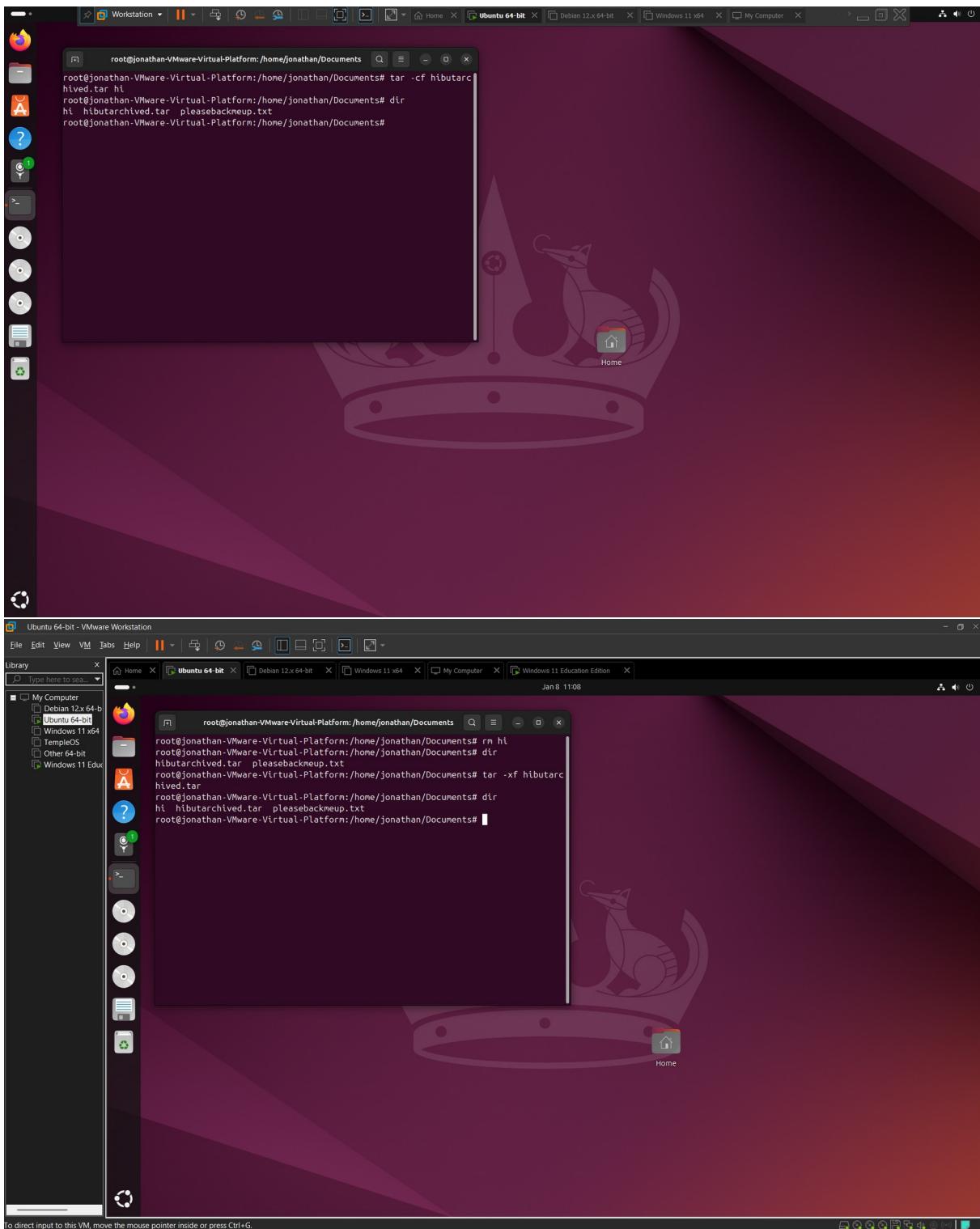
root@jonathan-VMware-Virtual-Platform:/home/jonathan# cd ..
root@jonathan-VMware-Virtual-Platform:/home# cd ..
root@jonathan-VMware-Virtual-Platform:# cd ./etc
root@jonathan-VMware-Virtual-Platform:/etc#

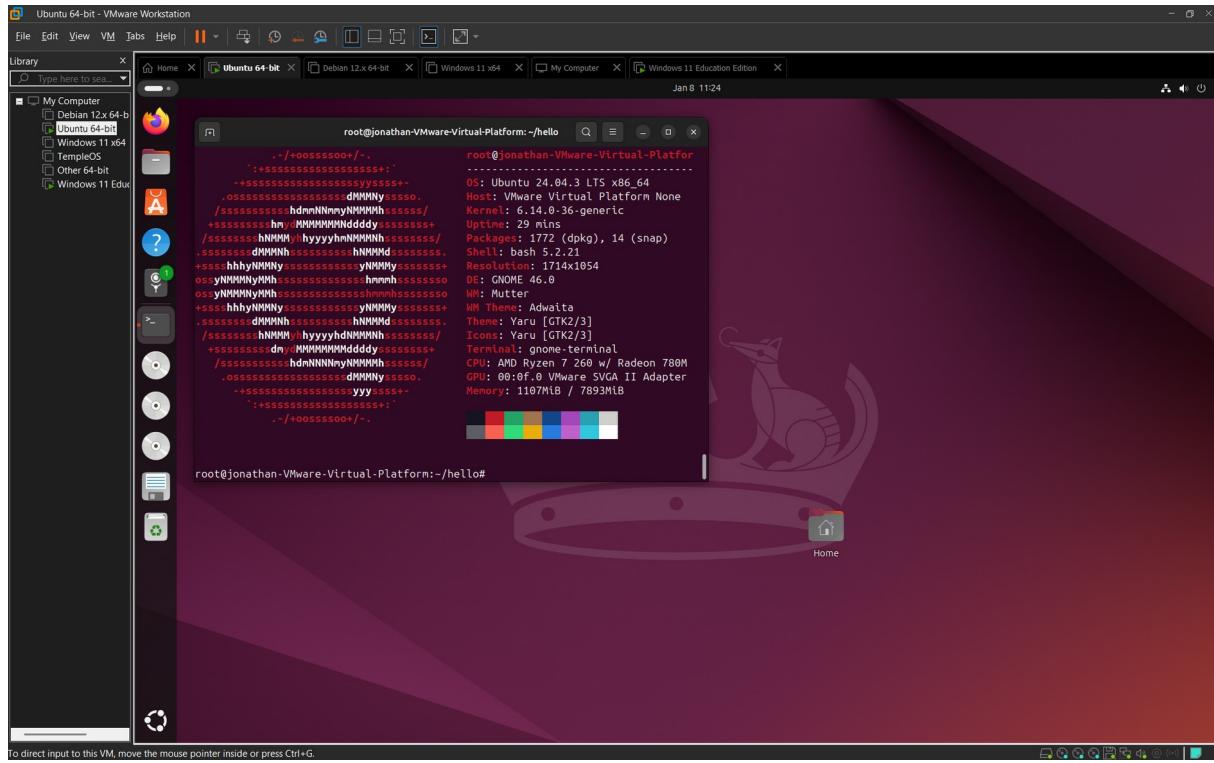
```



Linux uses one root folder, instead of drive letters.

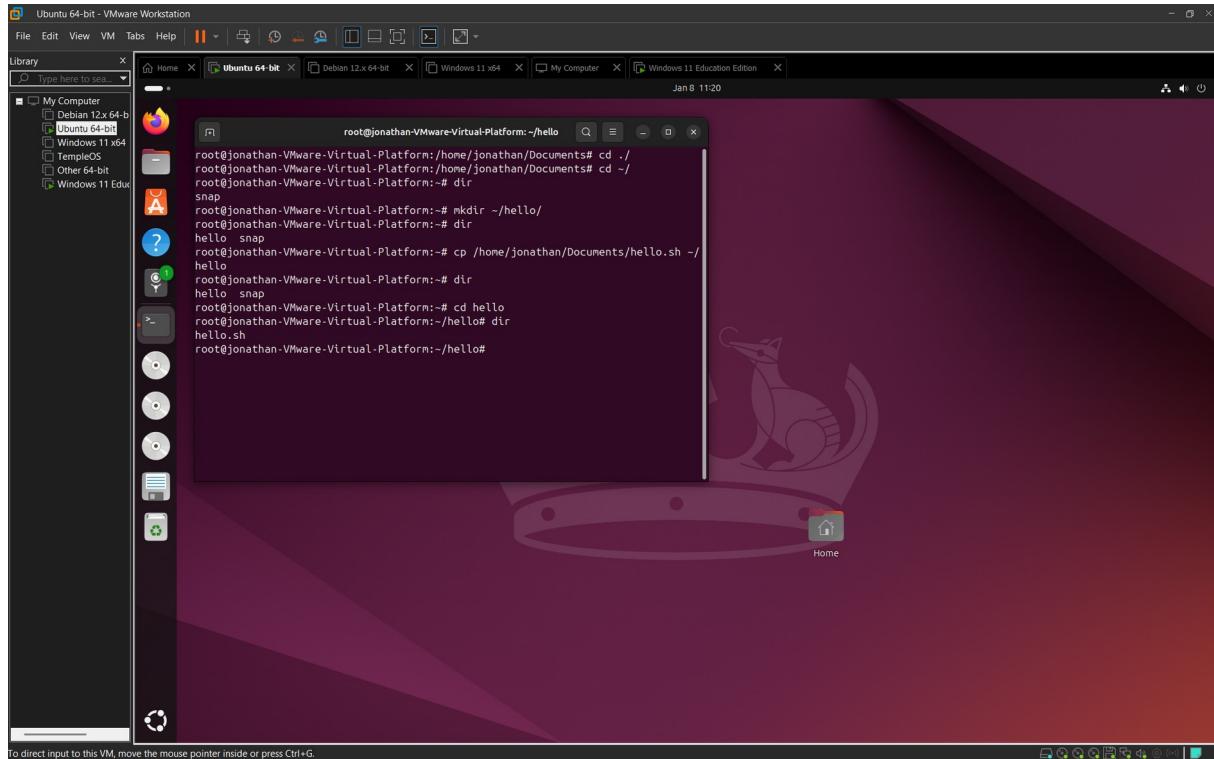
The /etc directory is for system configuration.

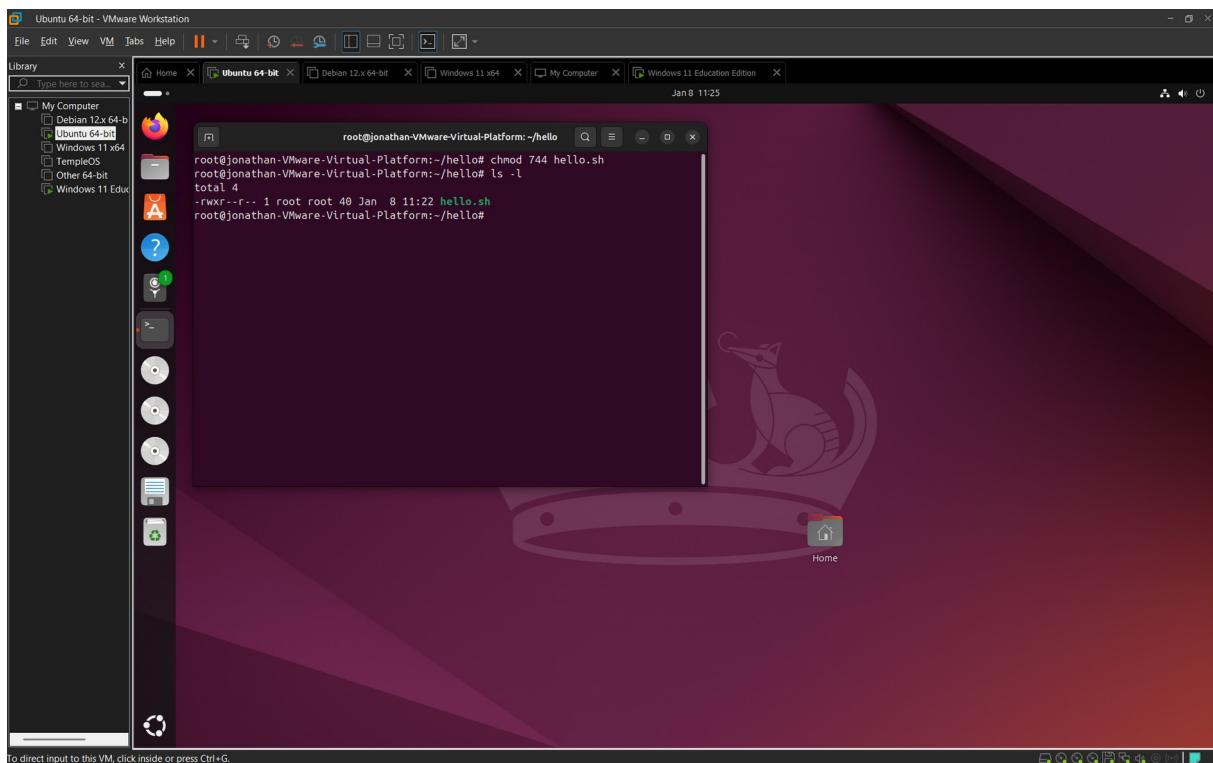
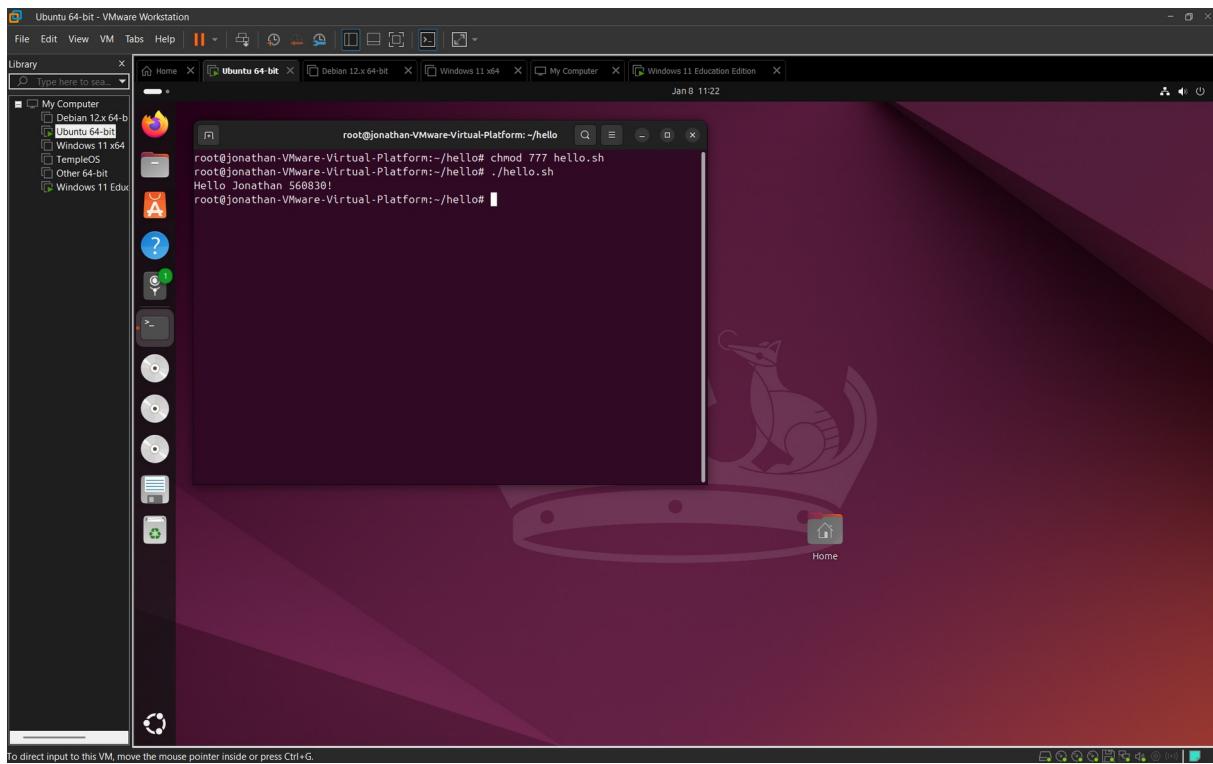




Assignment 5.5: Users and permissions on Linux

Relevant screenshots + motivation





Assignment 5.6: View the contents of files

Relevant screenshots + motivation

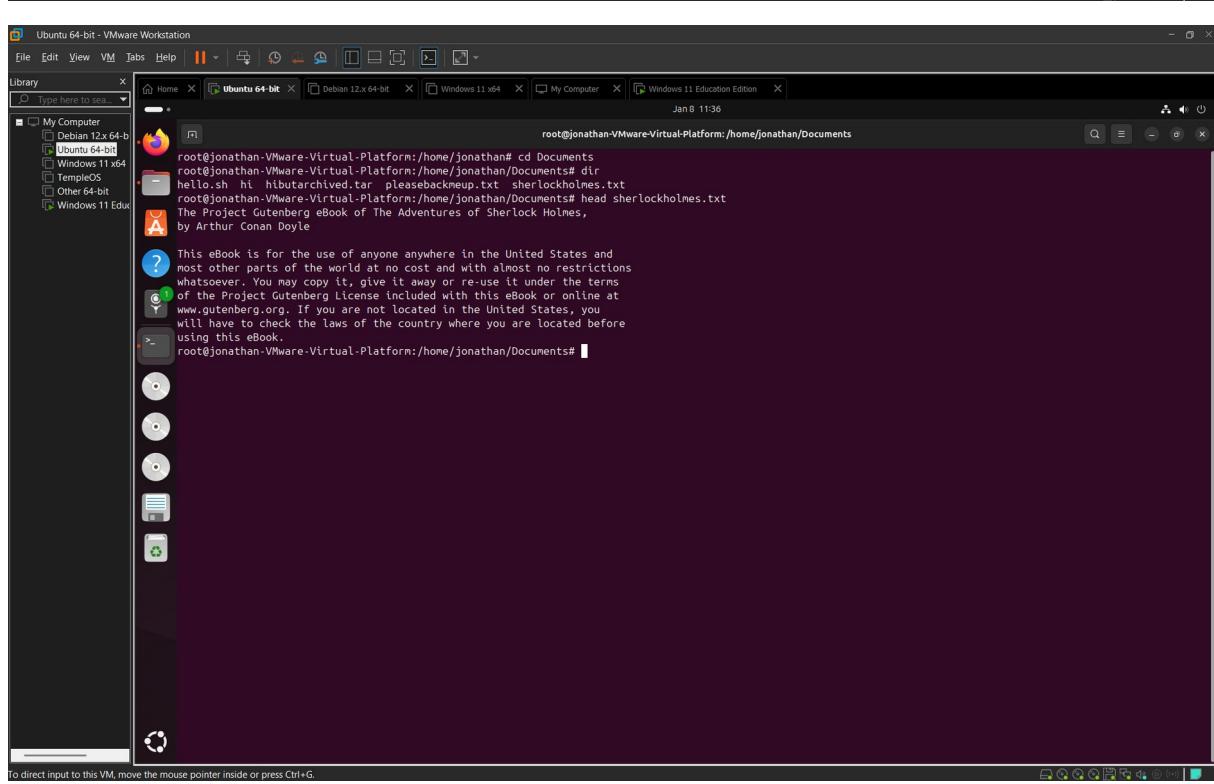
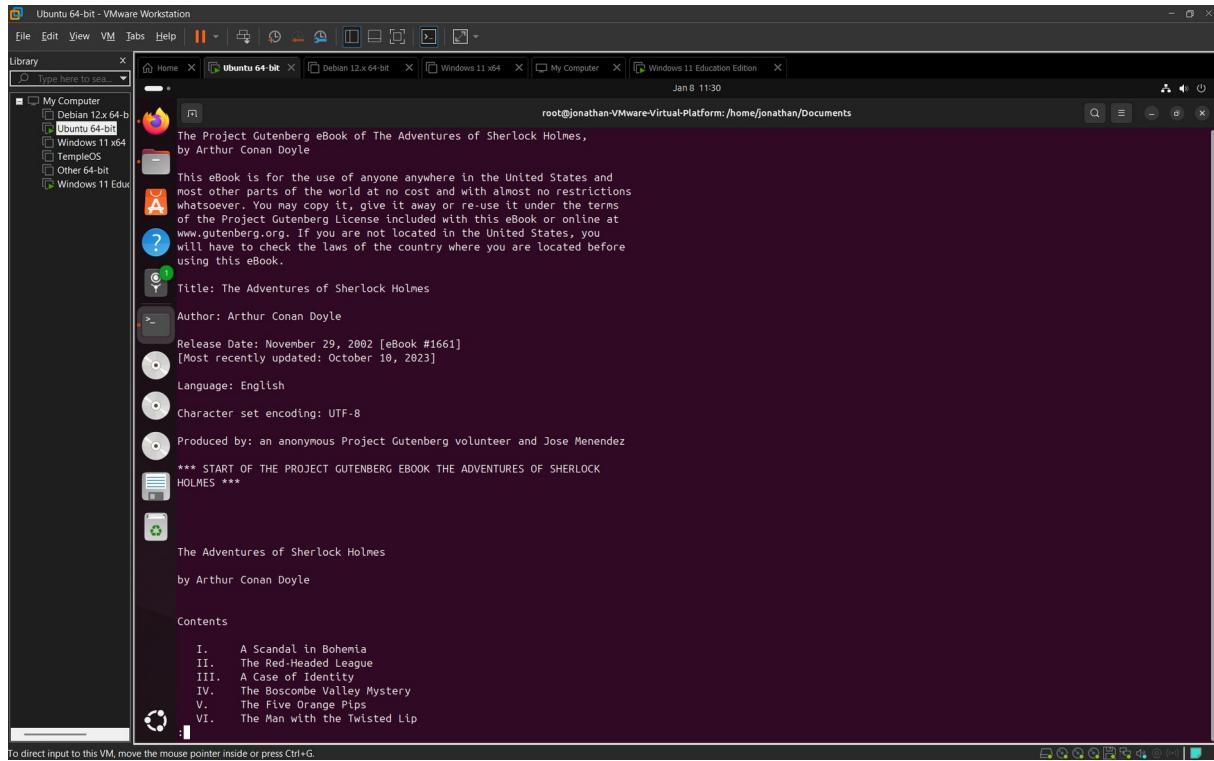
The image displays two vertically stacked screenshots of a VMware workstation interface, showing terminal sessions on an Ubuntu 64-bit virtual machine.

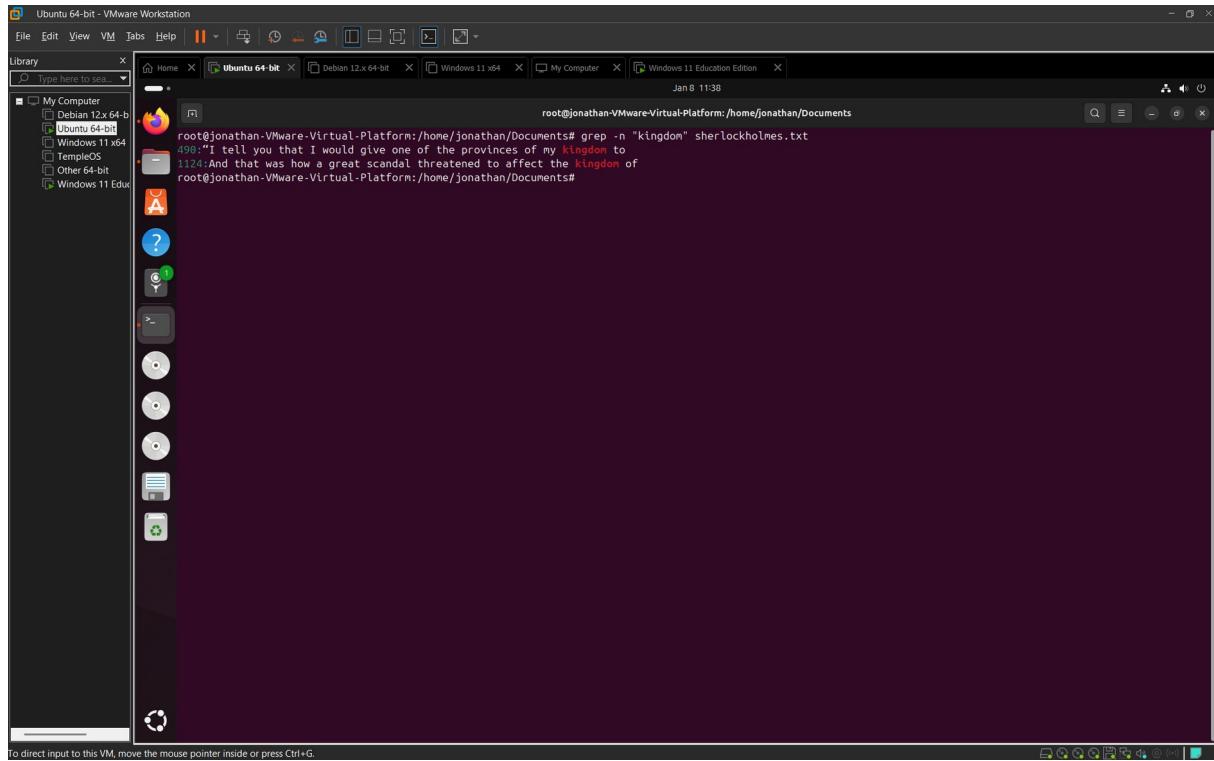
Screenshot 1: The terminal window shows a root shell on the Ubuntu 64-bit VM. The user is viewing a file named 'index.html' located at /home/jonathan/Documents. The content of the file discusses donations to Project Gutenberg, mentioning that international donations are accepted but U.S. laws prohibit accepting unsolicited donations from states where they have not met solicitation requirements. It also notes that most people start at the main website www.gutenberg.org.

```
root@jonathan-VMware-Virtual-Platform:/home/jonathan/Documents# cat index.html
```

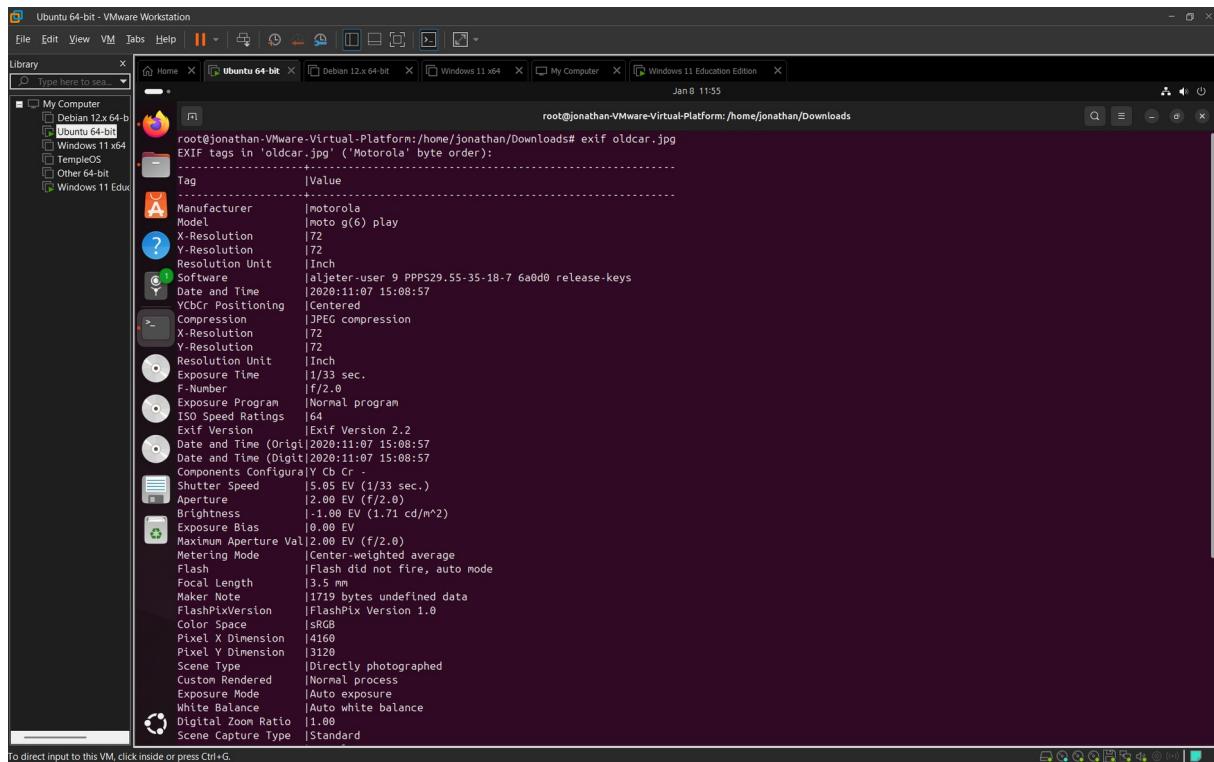
Screenshot 2: The terminal window shows a root shell on the Ubuntu 64-bit VM. The user runs the command 'wc sherlockholmes.txt' to count the words in the file 'sherlockholmes.txt'. The output shows 12307 words, 107562 lines, and 595196 characters.

```
root@jonathan-VMware-Virtual-Platform:/home/jonathan/Documents# wc sherlockholmes.txt
```

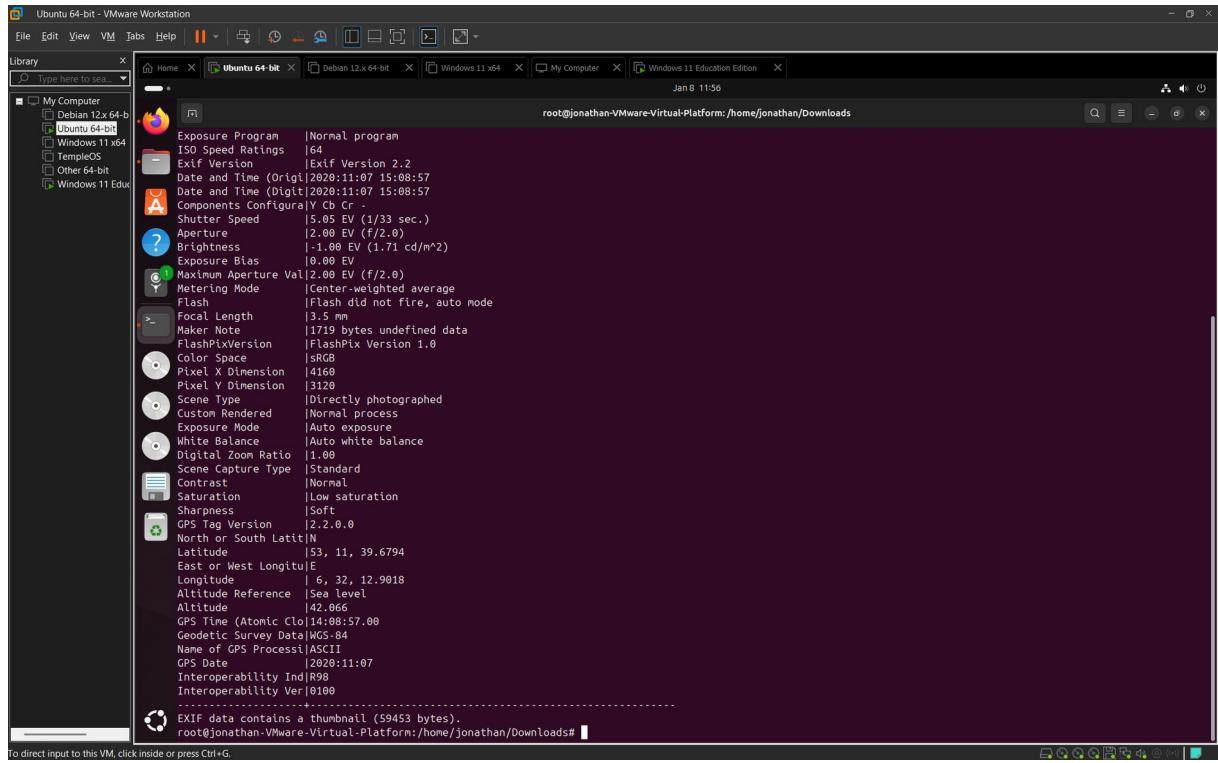




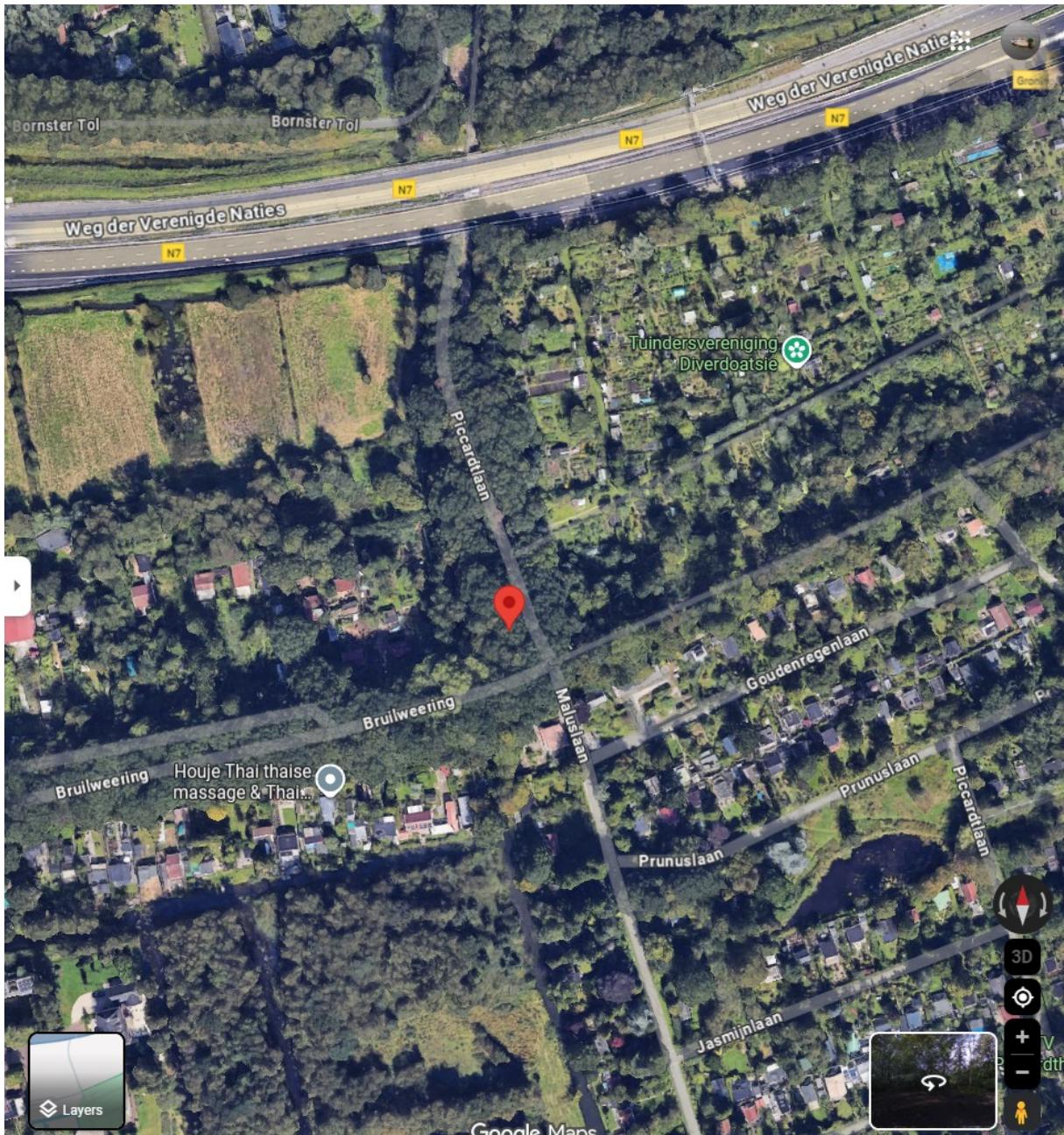
Assignment 5.7: Digital forensics



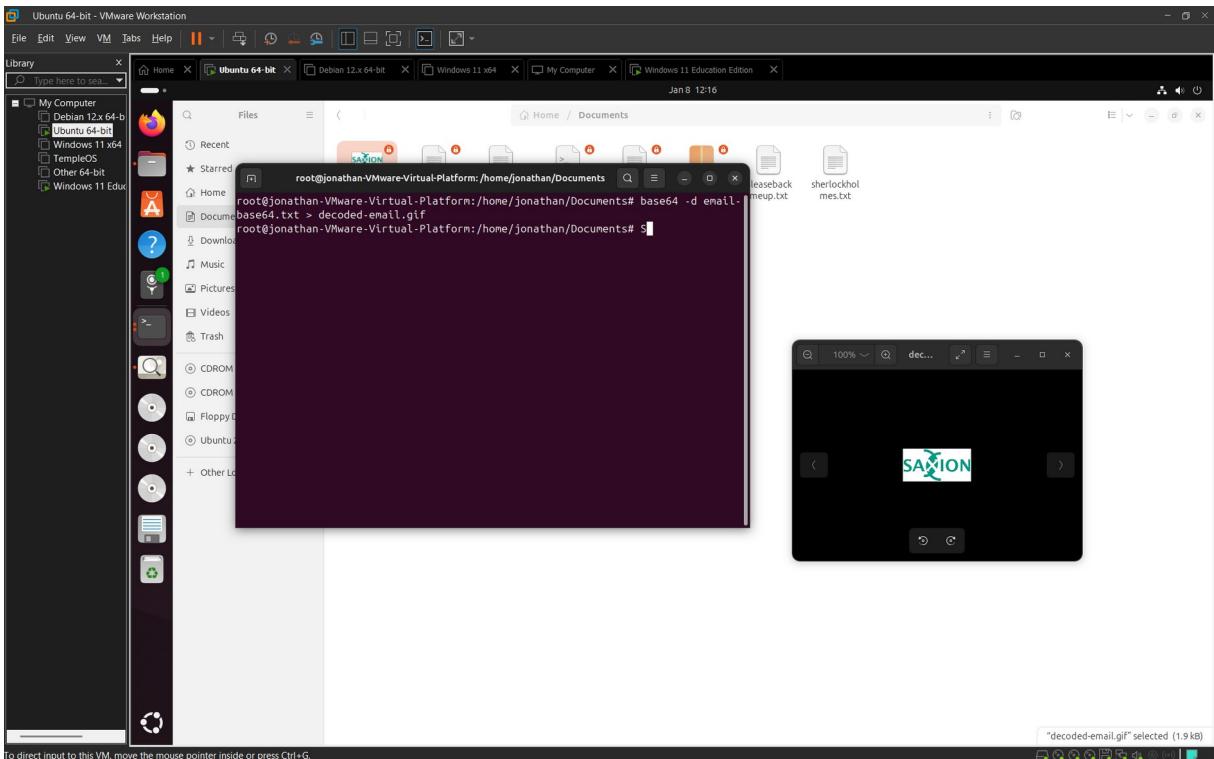
The phone is a Motorola G6 Play.



The coordinates are 53, 11, 39.6794 / 42.066.

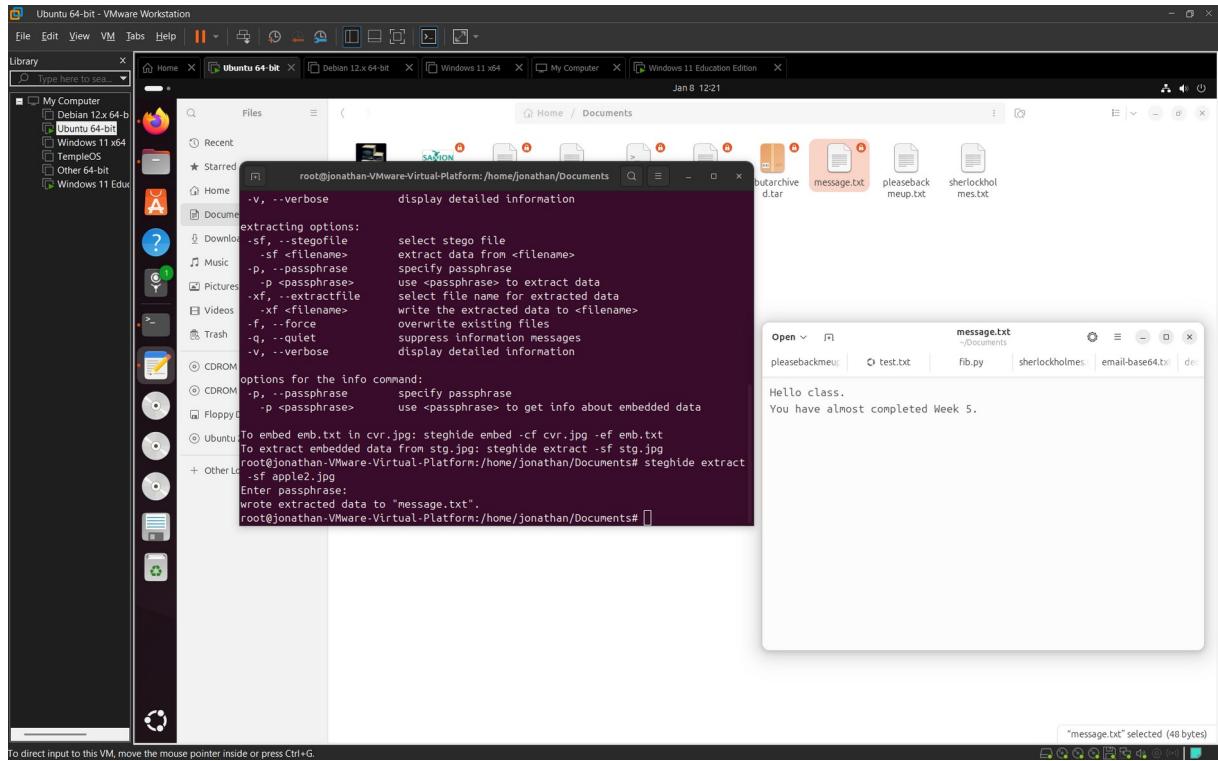






Assignment 5.8: Steganography

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](#)