CEIS106
Final Course Project

Introduction

In this project we used Ubuntu which is a Linux distribution based on Debian and composed mostly of free open source software.

Within Ubuntu we learned everything from navigating the filesystem tree, to adding users in CLI, to using network utilities.

First step

- In the first steps we learned the basics navigating through the filesystem tree.

- Created and located directories and files.

- And finally we learned how to copy and remove directories and files.

Navigate the Linux filesystem tree

- 1. What is the *pwd* command an acronym for? What about the *cd* command?

- Answer here:

- pwd: current working directory

- cd: change directory

- 2. Explain the differences between a relative path and an absolute/full path in Linux.

- Answer here:

- An absolute path is defined as specifying the location of a file or directory from the root directory(/). In other words,we can say that **an absolute path is a complete path from start of actual file system from / directory. Relative path is defined as the path related to the present working directly(pwd)**.

- References:

- 1. https://www.geeksforgeeks.org/absolute-relative-pathnames-unix/#:~:text=An%20absolute%20path%20is%20defined%20as%20specifying%20the%20location%20of,actual%20file%20system%20from%20%2F%20directory.&text=Relative%20path%20is%20defined%20as,present%20working%20directly(pwd).

Create directories and files

Copy and remove directories and files

Locate directories and files

Second Step

- Created shell scripts
- Change script file permissions
- Set PATH variable
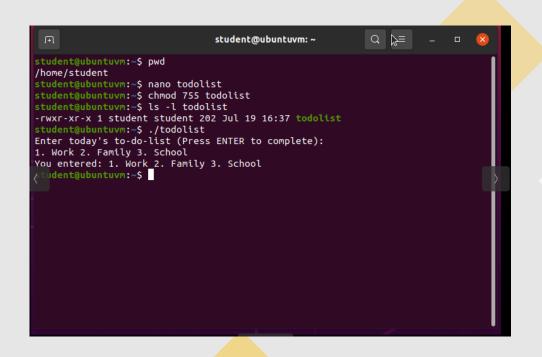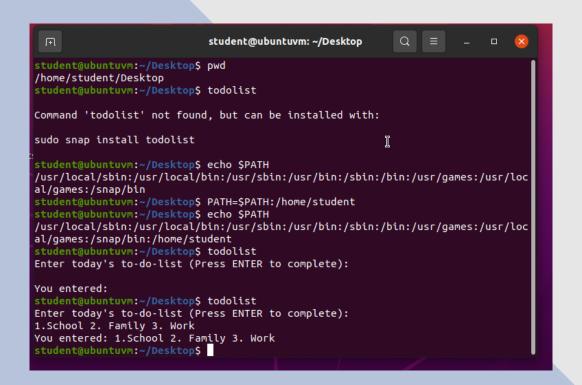- Make the path variable permanent
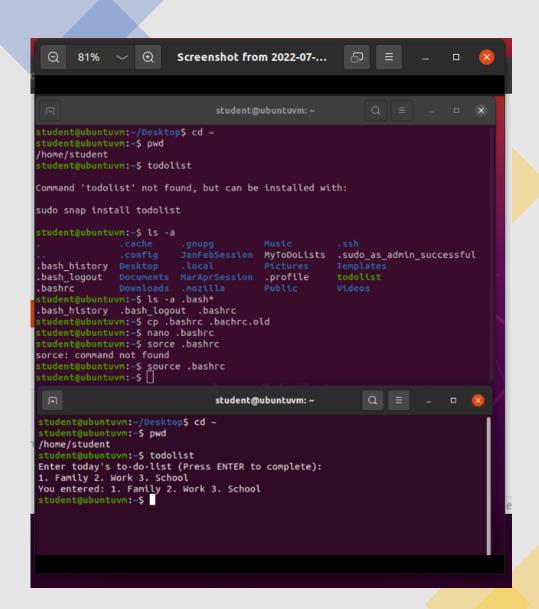
Create a shell script

- 1. What are the file permissions of the script?

- Answer here:

- rw- for the owner-- and write only (no execute)

- rw- for the group – read and write only (no execute)

- r-- for everyone else – read only (no write or execute)

- 2. What's the name of the user-defined variable in the script?

- Answer here:

- text

- 3. Which redirection meta-character is used in the script? What does it do?

- Answer here:

- >> -- redirects the output to the file and appends to the file (single arrow, > -- will overwrite file)

- References:

- 1.Project recording

- 2.Live Session
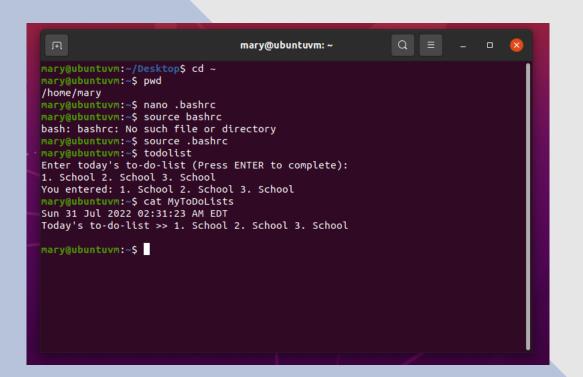
Change script file
permissions

Set the PATH variable

Make the PATH
variable permanent

Third Step
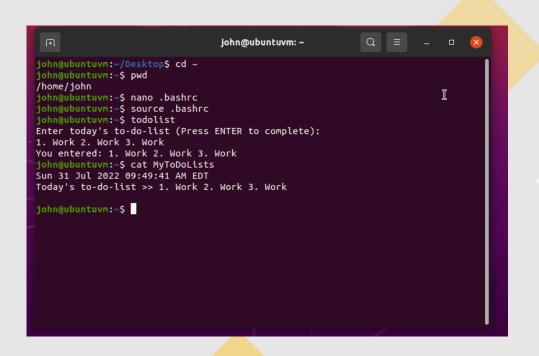
- Added users and groups in CLI
- Tested user a group settings
- Add users in GUI
- Removed users and groups

Add users and groups in CLI
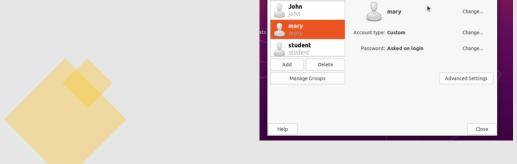
- 1. What does the *–m* option in the useradd command do?

- Answer here: will create a home directory for the user.

- 2. What does the *-3* option in the tail command do?

- Answer here: show the last three lines.

- 3. Which line of the */etc/group* file lists members of the "students" group? Copy it here.

- Answer here:

- References:

- 1.Project video

- 2.Project guide

Test user and group settings

```
john@ubuntuvm:~/Desktop$ cd ~
john@ubuntuvm:~$ pwd
/home/john
john@ubuntuvm:~$ nano .bashrc
john@ubuntuvm:~$ source .bashrc
john@ubuntuvm:~$ todolist
Enter today's to-do-list (Press ENTER to complete):
1. Work 2. Work 3. Work
You entered: 1. Work 2. Work 3. Work
john@ubuntuvm:~$ cat MyToDoLists
Sun 31 Jul 2022 09:49:41 AM EDT
Today's to-do-list >> 1. Work 2. Work 3. Work

john@ubuntuvm:~$
```
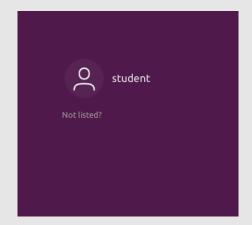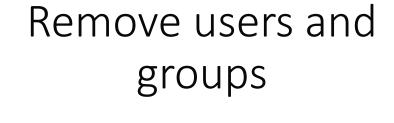
Add users in GUI

Remove users and groups

Discover host IP configurations

1. What is the IP address of your Ubuntu machine?
Answer here:192.168.1.104

2. What is the IP address of its default gateway?
Answer here:192.1681.1

3. What is the IP address of its DHCP server?
Answer here:192.168.1.1

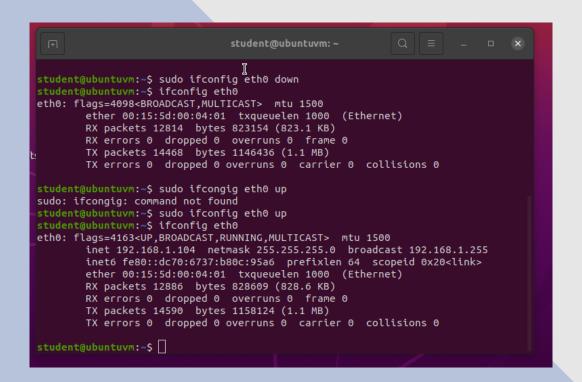4. What is the IP address of its DNS server?
Answer here:192.168.1.1

Manage network interfaces

- 1. Which DHCP message is shown in the output of the **sudo dhclient –v –r eth0** command? [hint: the message name is in uppercase.]

- Answer here:DHCPRELEASE

- 2. Which four DHCP messages are shown in the output of the **sudo dhclient –v eth0** command? [hint: the message names are in uppercase.]

- Answer here:

- DHCPDISCOVER, DHCPOFFER, DHCPREQUEST,DHCPACK

- References:

- 1.Completing the course project

- 2.

```
student@ubuntuvm:~$ sudo ifconfig eth0 down
student@ubuntuvm:~$ ifconfig eth0
eth0: flags=4098<BROADCAST,MULTICAST>  mtu 1500
        ether 00:15:5d:00:04:01  txqueuelen 1000  (Ethernet)
        RX packets 12814  bytes 823154 (823.1 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 14468  bytes 1146436 (1.1 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

student@ubuntuvm:~$ sudo ifcongig eth0 up
sudo: ifcongig: command not found
student@ubuntuvm:~$ sudo ifconfig eth0 up
student@ubuntuvm:~$ ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.1.104  netmask 255.255.255.0  broadcast 192.168.1.255
        inet6 fe80::dc70:6737:b80c:95a6  prefixlen 64  scopeid 0x20<link>
        ether 00:15:5d:00:04:01  txqueuelen 1000  (Ethernet)
        RX packets 12886  bytes 828609 (828.6 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 14590  bytes 1158124 (1.1 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

student@ubuntuvm:~$
```
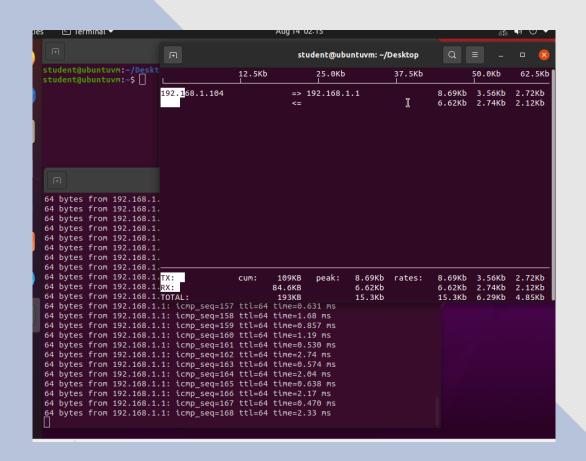
Use network utilities
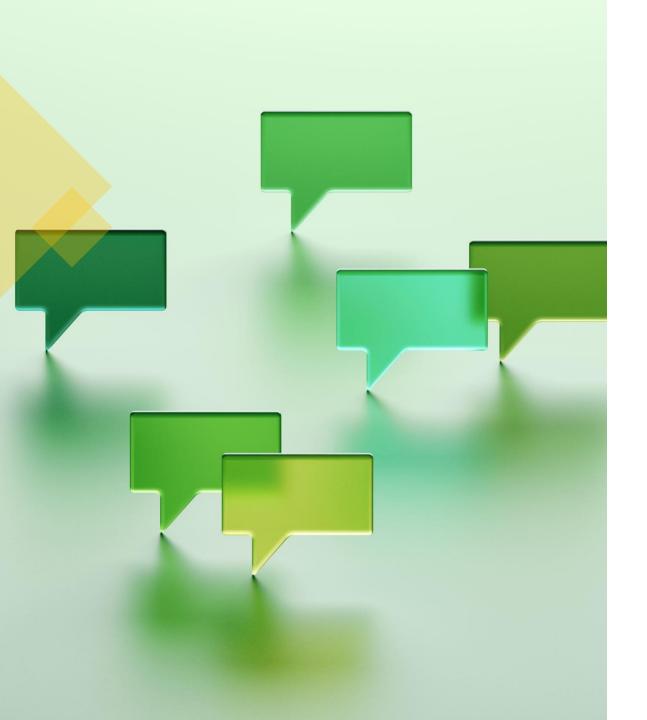
Monitor Linux processes

- 1. What is the default action of the *15 SIGTERM* kill signal?

- Answer here:

- Kill the highlighted process

- 2. In the System Monitor window, click on *% CPU* to sort the processes by CPU load. Which process shows the highest percentage of CPU usage?

- Answer here:

- gnome-shell

- References:

- 1.Completing the project

- 2.

Monitor user activities

- Issue the **sudo accton on** command to turn on GNC accounting. Run the **sudo updatedb** command. Enter **lastcomm updatedb** to check if the *updatedb* command was executed before. Remember to turn off GNC accounting (**sudo accton off**) after answering the questions.

- 1. What flag value is displayed in the output?

- Answer here: means the command was executed by the root (superuser)

- 2. Why is the name of the user who ran the processes shown as root, not student?

- Answer here: We put "sudo" in front of the command, which means "superuser do" and caused the root user (superuser) to execute the command for us

- References:

- 1.Project help video

- 2.

Monitor network bandwidth usage

Communication Skills

- Learned about professional topics and language through daily discussions.

- Watching the live sessions was very helpful to understanding certain things not only from the professors but from the other students.

Career Skills

- Several career skills were gained in this project like
  - Scripting
  - Network, monitoring, and management
  - Linux experience

Conclusion

This project covered the fundamental topics of Linux, by learning the basics of Ubuntu we were able to navigate though the filesystem tree, add and remove users, monitor and manage networks

Building this project provided a hands on learning opportunity to put into practice the topics covered in the course.