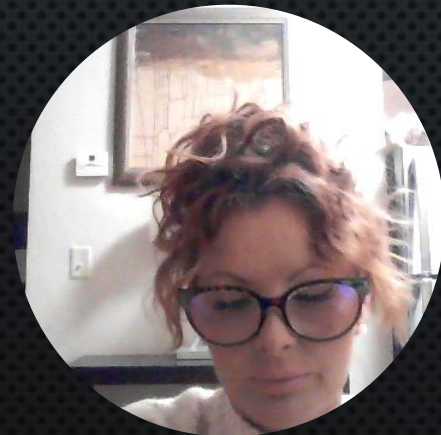


OPERATING SYSTEMS FINAL COURSE PROJECT

CREATED BY: LUPITA TODD

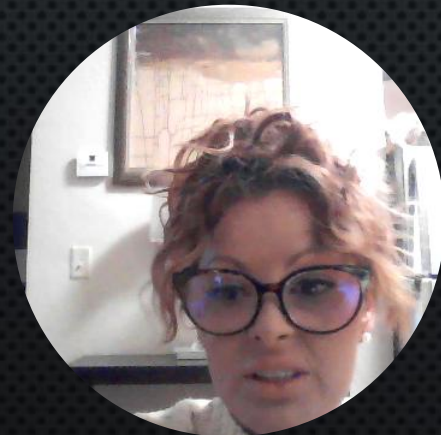
PROFESSOR: CHRISTINE HALSEY

DATE: FEBRUARY 21, 2025



INTRODUCTION

- SUMMARY OF WHAT IS IN THIS REPORT
- BASICS OF LINUX
- FILE MANAGEMENT
- USER AND GROUP MANAGEMENT
- SCRIPTS
- NETWORKING
- SECURITY



LINUX FILESYSTEM HIERARCHY

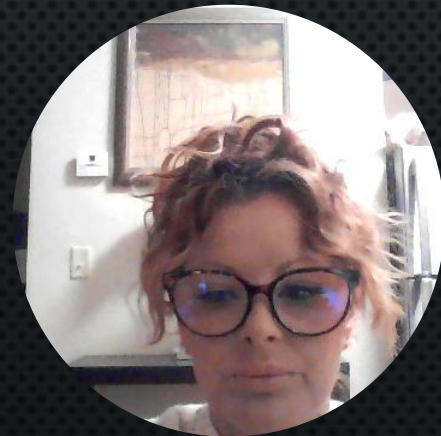
Activity

Navigate the Linux filesystem tree

Create directories and files

Copy and remove directories and files

Locate 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` - PRINT WORKING DIRECTORY - SHOWS THE PATH FOR THE CURRENT DIRECTORY

`CD` - CHANGE DIRECTORY - CHANGE OVER TO THE DIRECTORY THAT YOU SPECIFY

2. EXPLAIN THE DIFFERENCES BETWEEN A RELATIVE PATH AND AN ABSOLUTE/FULL PATH IN LINUX.

ANSWER HERE:

RELATIVE PATH - PATH BASED ON YOUR CURRENT LOCATION

ABSOLUTE PATH - PATH STARTING FROM THE VERY TOP OF THE FILESYSTEM, WHICH IS THE ROOT -- /

REFERENCES:

1. PROJECT VIDEO

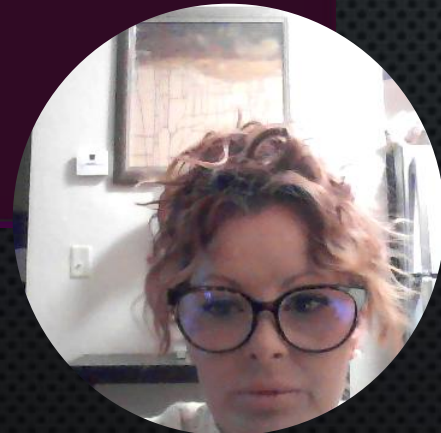
2. LIVE SESSION RECORDING 1, 2, & 3



CREATE DIRECTORIES AND FILES

```
├── JanFebSession
│   ├── Course1
│   ├── Course2
│   └── Course3
├── Music
├── Pictures
├── Public
├── shared-drives
├── snap
│   └── snap-store
├── Templates
└── Videos

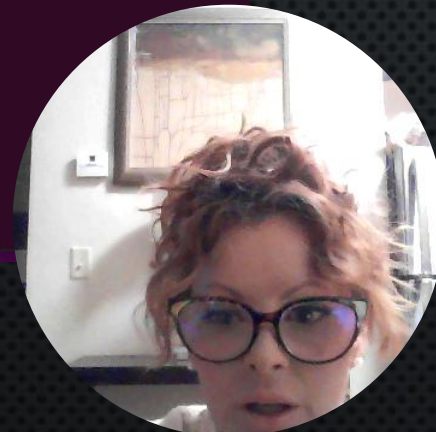
16 directories
student@ubuntu1:~/JanFebSession/Course1$ ls -l ~/JanFebSession/Course1
total 0
-rw-rw-r-- 1 student student 0 Jan 20 00:33 file1
-rw-rw-r-- 1 student student 0 Jan 20 00:33 file2
-rw-rw-r-- 1 student student 0 Jan 20 00:33 file3
student@ubuntu1:~/JanFebSession/Course1$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:~/JanFebSession/Course1$ date
Mon 20 Jan 2025 12:35:56 AM EST
student@ubuntu1:~/JanFebSession/Course1$ █
```



COPY AND REMOVE DIRECTORIES AND FILES

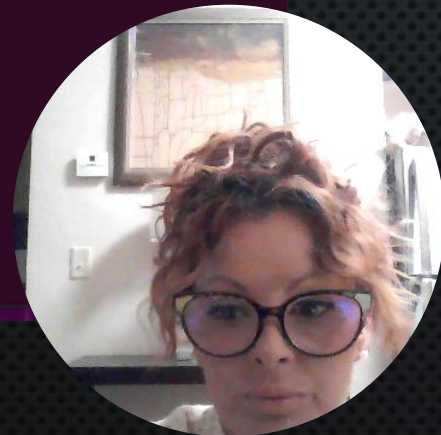
```
6 directories, 6 files
student@ubuntu1:~$ rmdir MarAprSession/Course3
student@ubuntu1:~$ rm MarAprSession/Course1/file3
student@ubuntu1:~$ tree JanFebSession MarAprSession
JanFebSession
├── Course1
│   ├── file1
│   ├── file2
│   └── file3
├── Course2
└── Course3
MarAprSession
├── Course1
│   ├── file1
│   └── file2
└── Course2

5 directories, 5 files
student@ubuntu1:~$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:~$ date
Mon 20 Jan 2025 12:52:30 AM EST
student@ubuntu1:~$ █
```



LOCATE DIRECTORIES AND FILES

```
448,872 files
31,464,236 bytes in file names
11,183,832 bytes used to store database
student@ubuntu1:~$ sudo updatedb
[sudo] password for student:
student@ubuntu1:~$ locate -i course
/home/student/JanFebSession/Course1
/home/student/JanFebSession/Course2
/home/student/JanFebSession/Course3
/home/student/JanFebSession/Course1/file1
/home/student/JanFebSession/Course1/file2
/home/student/JanFebSession/Course1/file3
/home/student/MarAprSession/Course1
/home/student/MarAprSession/Course2
/home/student/MarAprSession/Course1/file1
/home/student/MarAprSession/Course1/file2
student@ubuntu1:~$ locate -r /file1$
/home/student/JanFebSession/Course1/file1
/home/student/MarAprSession/Course1/file1
student@ubuntu1:~$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:~$ date
Mon 20 Jan 2025 01:11:01 AM EST
student@ubuntu1:~$ █
```



LINUX SHELL SCRIPTS

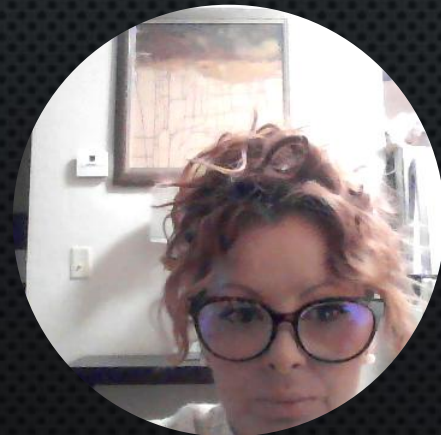
Activity

Create a shell script

Change script file permissions

Set the PATH variable

Make the PATH variable permanent



CREATE A SHELL SCRIPT

1. WHAT ARE THE FILE PERMISSIONS OF THE SCRIPT?

ANSWER HERE:

RW-RW-R-- -- READ/WRITE FOR THE OWNER, READ/WRITE FOR THE GROUP, READ ONLY FOR EVERYONE ELSE

2. WHAT'S THE NAME OF THE USER-DEFINED VARIABLE IN THE SCRIPT?

ANSWER HERE:

TEXT

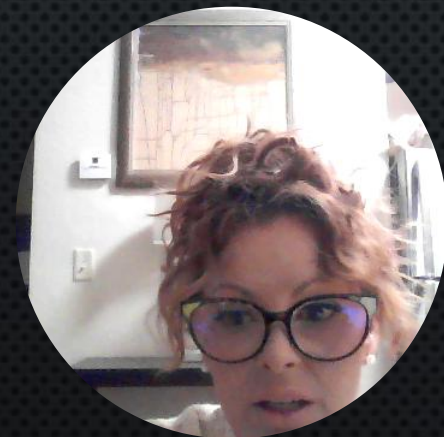
3. WHICH REDIRECTION META-CHARACTER IS USED IN THE SCRIPT? WHAT DOES IT DO?

ANSWER HERE:

>> -- REDIRECTION TO THE FILE AND APPENDS TO THE END OF THE FILE

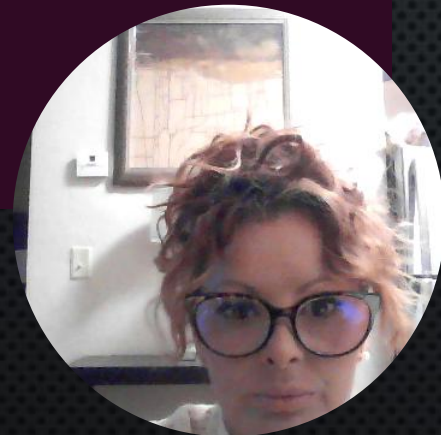
REFERENCES:

1. PROJECT RECORDING
2. PROJECT VIDEO



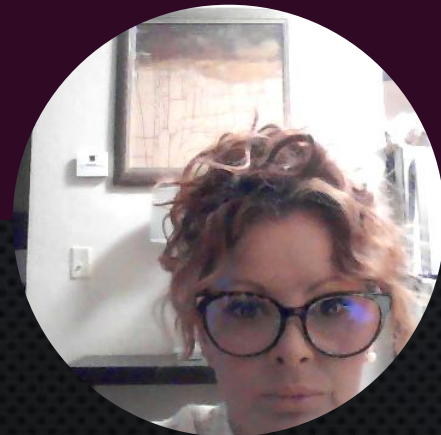
CHANGE SCRIPT FILE PERMISSIONS

```
student@ubuntu1:~$ pwd
/home/student
student@ubuntu1:~$ nano todolist
student@ubuntu1:~$ chmod 755 todolist
student@ubuntu1:~$ ls -l todolist
-rwxr-xr-x 1 student student 201 Jan 27 00:22 todolist
student@ubuntu1:~$ ./todolist
Enter today's to-do-list (Press ENTER to complete):
1. work 2. family 3. school
You entered: 1. work 2. family 3. school
student@ubuntu1:~$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:~$ date
Mon 27 Jan 2025 12:26:50 AM EST
student@ubuntu1:~$
```



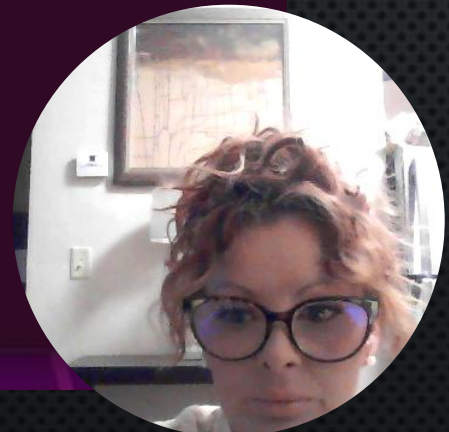
SET THE PATH VARIABLE

```
student@ubuntu1:~$ pwd
/home/student
student@ubuntu1:~$ todolist
todolist: command not found
student@ubuntu1:~$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/
ap/bin
student@ubuntu1:~$ PATH=$PATH:/home/student
student@ubuntu1:~$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/
ap/bin:/home/student
student@ubuntu1:~$ todolist
Enter today's to-do-list (Press ENTER to complete):
1. school 2. work 3. family
You entered: 1. school 2. work 3. family
student@ubuntu1:~$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:~$ date
Mon 27 Jan 2025 12:33:24 AM EST
student@ubuntu1:~$ █
```



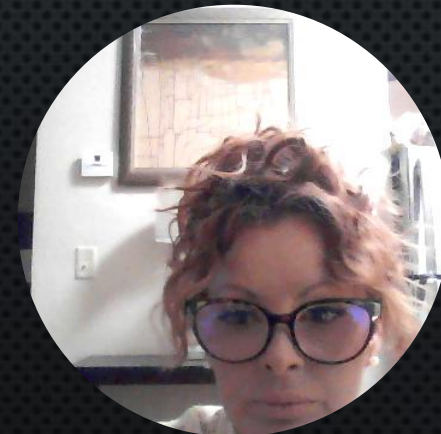
MAKE THE PATH VARIABLE PERMANENT

```
student@ubuntu1: ~  
stude/home/student@ubuntu1:~/Desktop$ cd  
/home/student@ubuntu1:~$ todolist  
stude: todolist Enter today's to-do-list (Press ENTER to complete):  
todolist student 1. family 2. school 3. work  
stude: Desktop You entered: 1. family 2. school 3. work  
/usr/Documents student@ubuntu1:~$ echo "Lupita Todd"  
ap/bi student@ubuntu1:~$ date  
stude: student@ubuntu1:~$ date  
stude:.. Mon 27 Jan 2025 12:52:45 AM EST  
/usr/.bash student@ubuntu1:~$ █  
ap/bi.bash █  
stude.bash █  
Enter.cache █  
1. sc.conf █  
You eDesktop █  
studeDocuments █  
LupitaDownloads █  
stude student █  
Mon 27 Jan 2025 12:52:45 AM EST █  
stude student █  
stude student █  
stude student █
```



USER AND GROUP MANAGEMENT

Activity
Add users and groups in CLI
Test user and group settings
Add users in GUI
Remove users and groups



ADD USERS AND GROUPS IN CLI

1. WHAT DOES THE `-M` OPTION IN THE `USERADD` COMMAND DO?

ANSWER HERE:

`-M` — TELLS `USERADD` COMMAND TO CREATE A HOME DIRECTORY FOR THIS NEW USER

2. WHAT DOES THE `-3` OPTION IN THE `TAIL` COMMAND DO?

ANSWER HERE:

`-3` — TELLS `TAIL` COMMAND HOW MANY LINES TO SHOW FROM THE END OF THE FILE

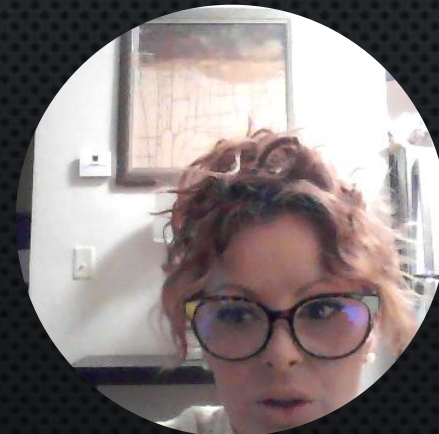
3. WHICH LINE OF THE `/ETC/GROUP` FILE LISTS MEMBERS OF THE “STUDENTS” GROUP? COPY IT HERE.

ANSWER HERE: `students:x:1002:student,mary`

REFERENCES:

1. PROJECT VIDEO

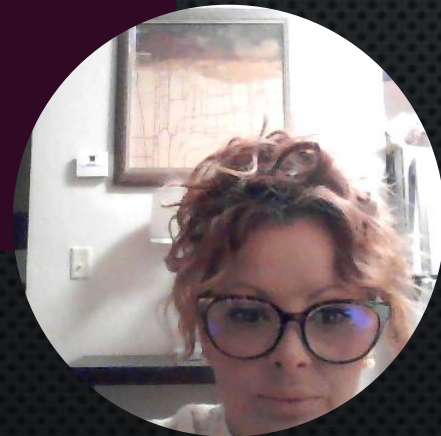
2. LIVE SESSION RECORDING



TEST USER AND GROUP SETTINGS

```
mary@ubuntu1: ~/Desktop$ cd
mary@ubuntu1: ~$ nano .bashrc
mary@ubuntu1: ~$ source .bashrc
mary@ubuntu1: ~$ todolist
Enter today's to-do-list (Press ENTER to complete):
1. school 2. school 3. school
You entered: 1. school 2. school 3. school
mary@ubuntu1: ~$ cat MyToDoLists
Sun 02 Feb 2025 02:02:48 PM EST
Today's to-do-list -- 1. school 2. school 3. school

mary@ubuntu1: ~$ echo "Lupita Todd"
Lupita Todd
mary@ubuntu1: ~$ date
Sun 02 Feb 2025 02:04:14 PM EST
mary@ubuntu1: ~$
```



ADD USERS IN GUI

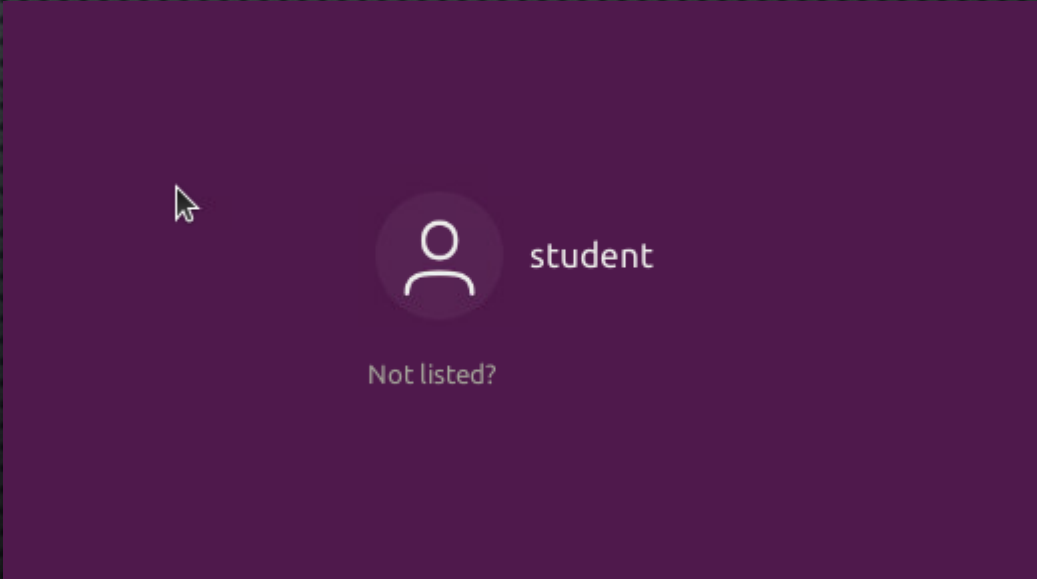
```
john@ubuntu1: ~  
john@ubuntu1:~/Desktop$ cd  
john@ubuntu1:~$ pwd  
/home/john  
john@ubuntu1:~$ nano .bashrc  
john@ubuntu1:~$ source .bashrc  
john@ubuntu1:~$ todolist  
Enter today's to-do-list (Press ENTER to complete):  
1. family 2. family 3. family  
You entered: 1. family 2. family 3. family  
john@ubuntu1:~$ echo "Lupita Todd"  
Lupita Todd  
john@ubuntu1:~$ date  
Sun 02 Feb 2025 02:30:08 PM EST  
john@ubuntu1:~$
```



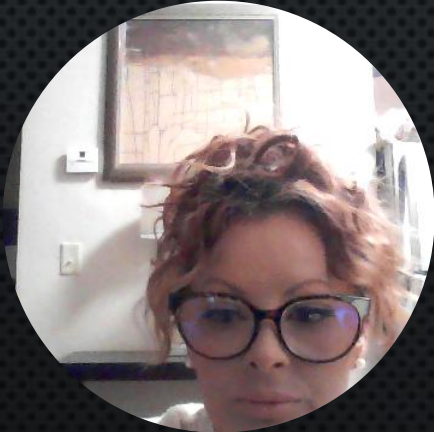
REMOVE USERS AND GROUPS



A screenshot of a user selection interface. It features three user entries, each with a white person icon on a dark purple circular background. The entries are labeled 'student', 'mary', and 'John' from top to bottom. Below the 'John' entry is a link that says 'Not listed?'. The entire interface is set against a dark purple background.



A screenshot of the same user selection interface, but with a mouse cursor pointing at the 'student' user entry. The 'student' entry is highlighted with a white glow. The 'Not listed?' link is still visible below the 'student' entry. The background is dark purple.



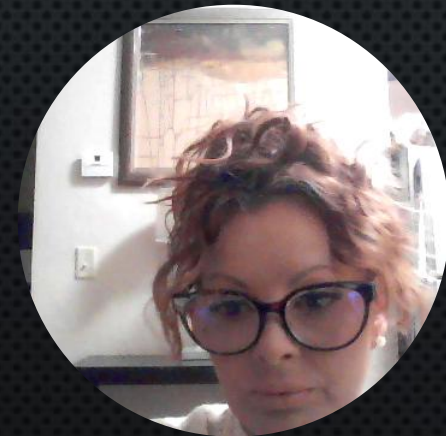
NETWORK CONFIGURATION

Activity

Discover host IP configurations

Manage network interfaces

User network utilities



DISCOVER HOST IP CONFIGURATIONS

1. WHAT IS THE IP ADDRESS OF YOUR UBUNTU MACHINE?

ANSWER HERE:

192.168.1.108

2. WHAT IS THE IP ADDRESS OF ITS DEFAULT GATEWAY?

ANSWER HERE:

192.168.1.1

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?

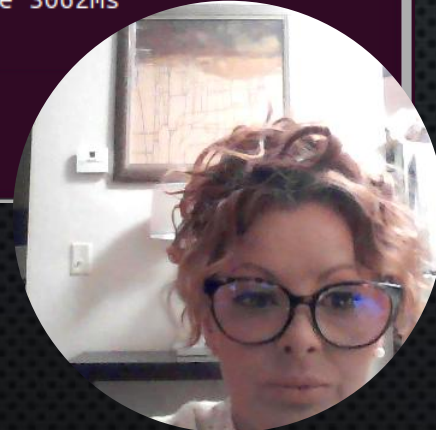
ANSWER HERE:

192.168.1.1

```
# Third party programs must not access this file directly, but only through the
# symlink at /etc/resolv.conf. To manage man:resolv.conf(5) in a different way,
# replace this symlink by a static file or a different symlink.
#
# See man:systemd-resolved.service(8) for details about the supported modes of
# operation for /etc/resolv.conf.

nameserver 192.168.1.1
search devry.edu
student@ubuntu1:/var/lib/dhcp$ ping -c 4 192.168.1.1
PING 192.168.1.1 (192.168.1.1) 56(84) bytes of data:
54 bytes from 192.168.1.1: icmp_seq=1 ttl=64 time=0.463 ms
54 bytes from 192.168.1.1: icmp_seq=2 ttl=64 time=0.427 ms
54 bytes from 192.168.1.1: icmp_seq=3 ttl=64 time=0.569 ms
54 bytes from 192.168.1.1: icmp_seq=4 ttl=64 time=0.569 ms

--- 192.168.1.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3062ms
rtt min/avg/max/mdev = 0.427/0.507/0.569/0.063 ms
student@ubuntu1:/var/lib/dhcp$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:/var/lib/dhcp$ date
Mon 10 Feb 2025 12:32:36 AM EST
student@ubuntu1:/var/lib/dhcp$
```



MANAGE NETWORK INTERFACES

1. WHICH DHCP MESSAGE IS SHOWN IN THE OUTPUT OF THE **SUDO DHCLIENT -V -R ETH0** COMMAND?

ANSWER HERE:

DHCPRELEASE

2. WHICH FOUR DHCP MESSAGES ARE SHOWN IN THE OUTPUT OF THE **SUDO DHCLIENT -V ETH0** COMMAND?

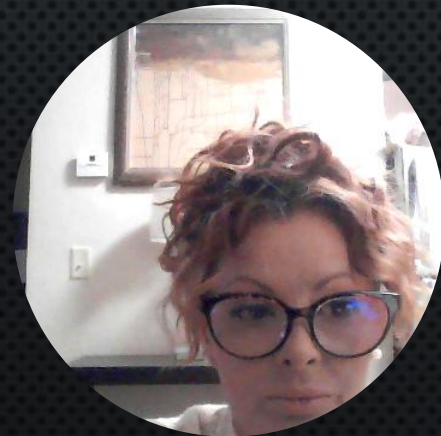
ANSWER HERE:

DHCPDISCOVER

DHCPOFFER

DHCPREQUEST

DHCPACK

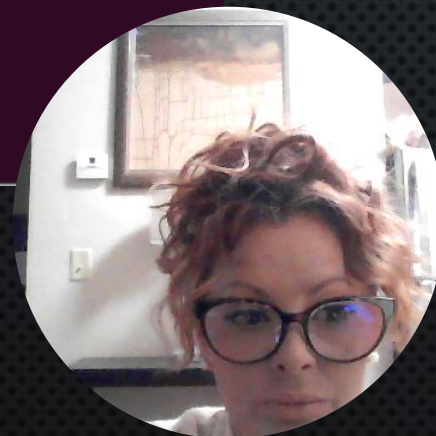


USE NETWORK UTILITIES

```
student@ubuntu1:~$ sudo ifconfig eth0 down
student@ubuntu1:~$ ifconfig eth0
eth0: flags=4098<BROADCAST,MULTICAST> mtu 1500
    ether 00:15:5d:00:ba:04 txqueuelen 1000 (Ethernet)
    RX packets 4459 bytes 348948 (348.9 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 6981 bytes 571388 (571.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

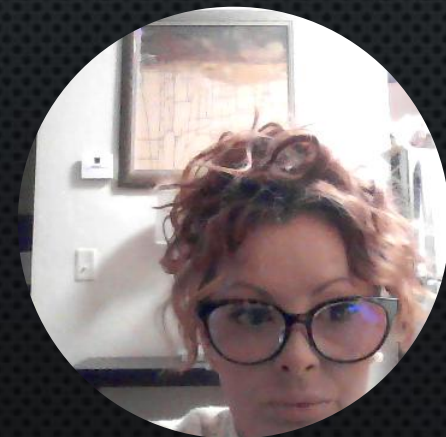
student@ubuntu1:~$ sudo ifconfig eth0 up
student@ubuntu1:~$ ifconfig eth0
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.107 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::7b9e:ebf5:11a6:34e4 prefixlen 64 scopeid 0x20<link>
    ether 00:15:5d:00:ba:04 txqueuelen 1000 (Ethernet)
    RX packets 4512 bytes 353427 (353.4 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 7110 bytes 583539 (583.5 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

student@ubuntu1:~$ echo "Lupita Todd"
Lupita Todd
student@ubuntu1:~$ date
Mon 10 Feb 2025 12:57:41 AM EST
student@ubuntu1:~$
```



SYSTEM PERFORMANCE MONITORING

Activity
Monitor processes
Monitor user activities
Monitor network bandwidth usage



MONITOR LINUX PROCESSES

1. WHAT IS THE DEFAULT ACTION OF THE *15 SIGTERM* KILL SIGNAL?

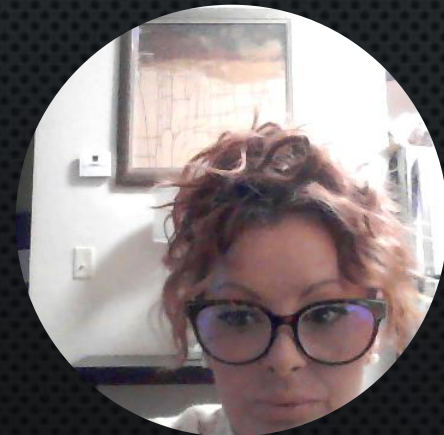
ANSWER HERE: KILL THE HIGHLIGHTED PROCESS.

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 (GUI)

REFERENCES:

1. PROJECT ASSISTANCE VIDEO



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?

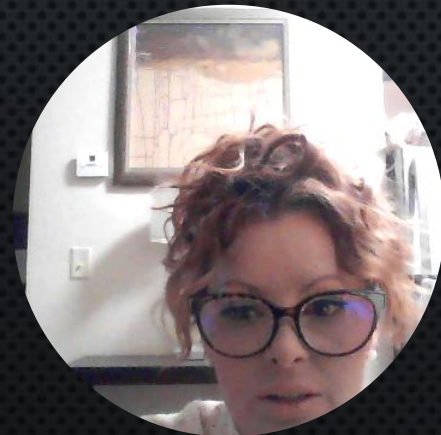
ANSWER HERE: S – “SUPER USER”

2. WHY IS THE NAME OF THE USER WHO RAN THE PROCESSES SHOWN AS ROOT, NOT STUDENT?

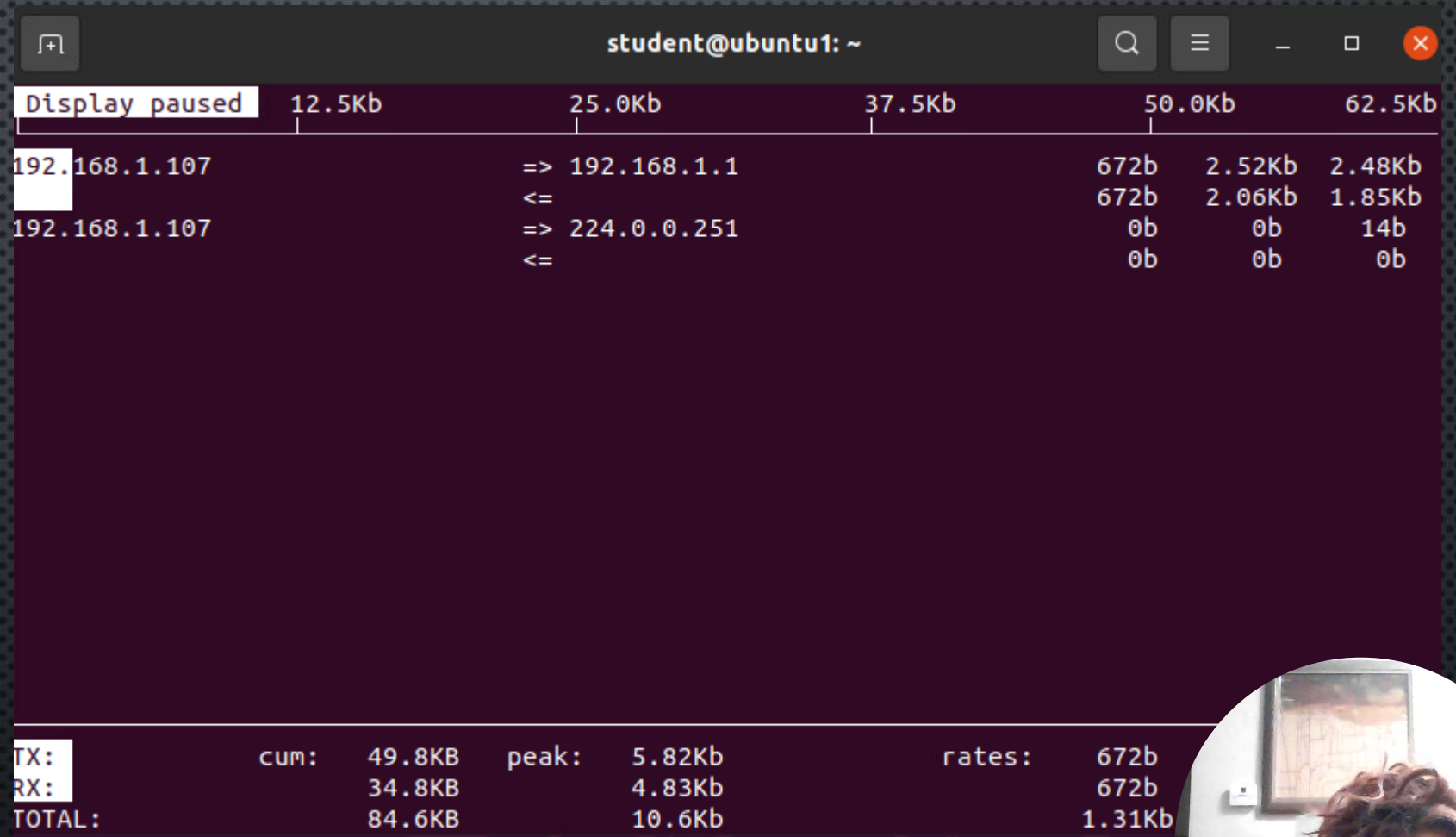
ANSWER HERE: SUPERUSER – SINCE WE TYPED SUDO IN FRONT OF THE COMMAND.

REFERENCES:

1. PROJECT ASSISTANCE VIDEO

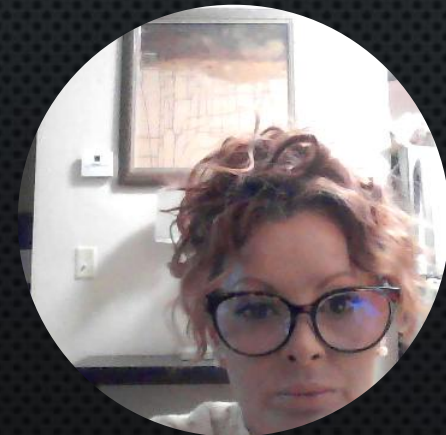


MONITOR NETWORK BANDWIDTH USAGE



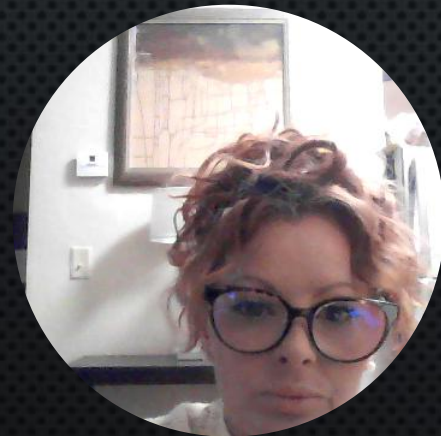
CHALLENGES

- LEARNING HOW TO SIZE SCREENSHOTS.
- LEARNING HOW TO MANAGE UP TO FIVE LAYERED WINDOWS.
- LEARNING HOW TO USE LINUX IN A LIMITED WORKSPACE.
- LEARNING HOW TO USE INFOSEC ENVIRONMENT.
- LEARNING PROFICIENCY IN PUNCTUATION AND CASE-SENSITIVE COMMANDS.
- UTILIZING TIME MANAGEMENT SKILLS



CAREER SKILLS

- CREATING AND MANAGING USERS
- COMMAND-LINE PROFICIENCY
- TIME MANAGEMENT
- EFFECTIVE MULTITASKING



CONCLUSION

- LEARNING LINUX BY MANAGING FILES, DIRECTORIES, AND USER ACCOUNTS.
- PRACTICED SHELL SCRIPTS, FILE PERMISSIONS, USER COMMANDS SUDO/ USERADD, AND CONFIGURED NETWORK SETTINGS.
- MONITORED SYSTEM PERFORMANCE, ALSO PROCESSES IN MANAGING GROUPS.
- OVERCOMING CHALLENGES
- SHOWING A VISUAL GUIDE AND PRACTICING A VISUAL GUIDED OF STEP- BY-STEP IMAGES.

