

Ubuntu Basics Reference Guide

Objective: Provide a foundational understanding of Ubuntu commands, navigation, and system operations.

Part 1: Basic Navigation

1. Login and Open Terminal:

- Log into the Ubuntu system.
- Open the terminal using **Ctrl+Alt+T** or from the applications menu.

2. Navigating Directories:

- List files and directories: **ls**
- Change directory: **cd <directory_name>**
- Move up one level: **cd ..**
- Move up multiple levels: **cd ../../example**
- Print the current working directory: **pwd**

3. Creating and Removing Files and Directories:

- Create a directory: **mkdir test_directory**
- Create an empty file: **touch test_file.txt**
- Remove a file: **rm test_file.txt**
- Remove a directory: **rmdir test_directory**

4. Viewing File Contents:

- Display file contents: **cat <file_name>**
 - View file contents with pagination: **less <file_name>**
-

Part 2: Basic Administration

1. Updating the System:

- Update package lists: **sudo apt update**
- Upgrade installed packages: **sudo apt upgrade**

2. Managing Users:

- Add a new user: **sudo adduser <username>**

- Switch to another user: **su - <username>**
- Remove a user: **sudo deluser <username>**

3. Password Management:

- Change the current user's password: **passwd**
- Change another user's password (as admin): **sudo passwd <username>**
- Lock a user account: **sudo passwd -l <username>**
- Unlock a user account: **sudo passwd -u <username>**

4. Checking System Information:

- Check disk usage: **df -h**
- Check memory usage: **free -h**
- View system uptime: **uptime**

5. Permissions:

- Change file permissions: **chmod 755 <file_name>**
- View file permissions: **ls -l**

6. Disk and Partition Information:

- List block devices: **lsblk**
- Check directory sizes: **du -sh /path/to/directory**

View partition information: **sudo fdisk -l**

Processes:

1. View Running Processes:

- Open the terminal using **Ctrl+Alt+T** or from the applications menu.
- Display all running processes:

```
ps aux
```

- Display processes in a tree view for better visualization:

```
pstree
```

- Find a specific process by keyword:

```
ps aux | grep <process_name>
```

2. Find Process ID (PID):

- Display processes with their **Process IDs (PIDs)**:

```
ps -e
```

- Search for a specific process and display its PID:

```
pgrep <process_name>
```

3. Kill a Process by PID:

- Terminate a process using its PID:

```
kill <PID>
```

- Forcefully terminate a process if it doesn't stop:

```
kill -9 <PID>
```

4. Kill a Process by Name:

- Kill a process using its name:

```
pkill <process_name>
```

- Forcefully kill all processes with the same name:

```
pkill -9 <process_name>
```

5. Verify Process Termination:

- Check if a process is still running by PID:

```
ps -p <PID>
```

- Verify using pgrep:

```
pgrep <process_name>
```

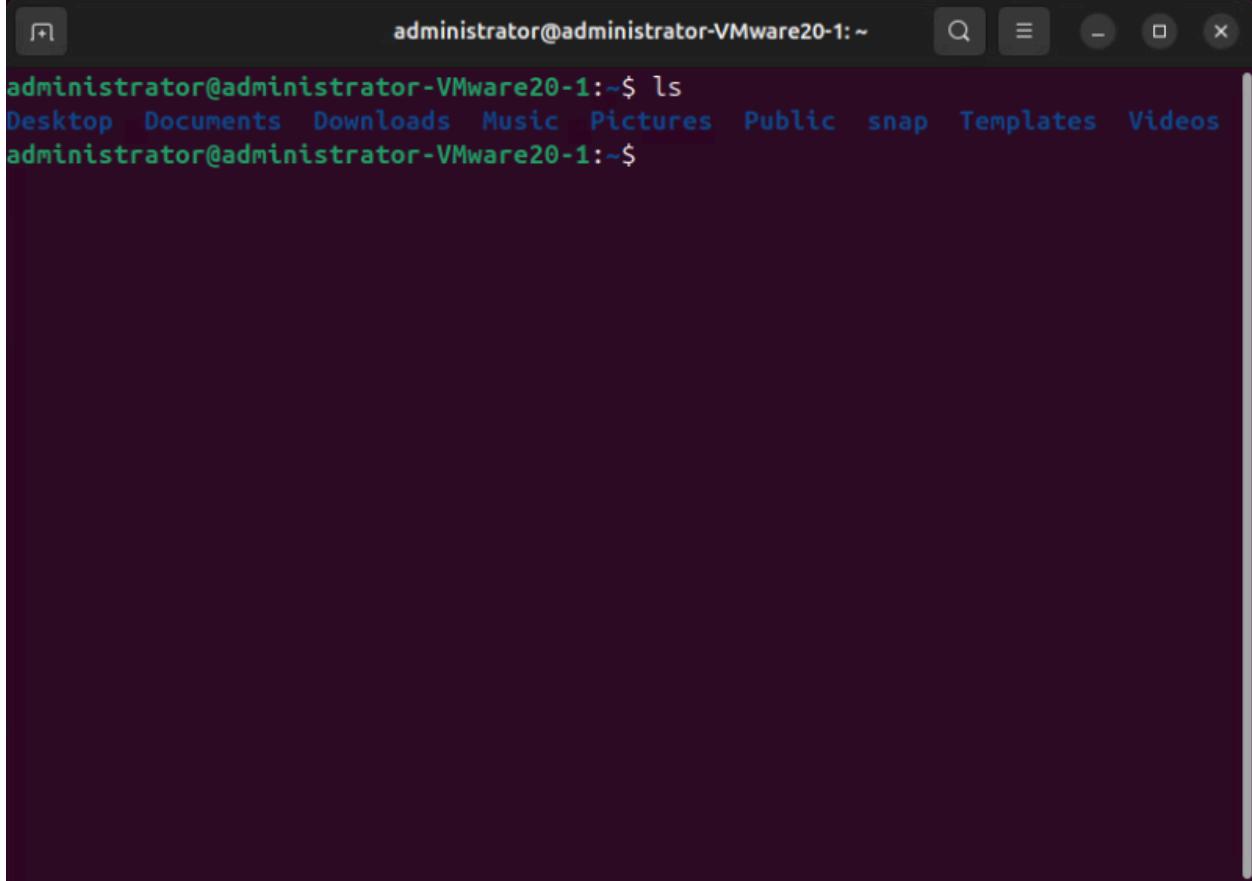
- If no output is returned, the process has been successfully terminated.
-

Objective: Learn and apply foundational Ubuntu commands for navigation, file management, and system administration.

1. Start the Ubuntu terminal.
2. Navigate to the home directory using `cd ~`. Type “`ls`”

What's the output?

Desktop, Documents, Downloads, Music, Pictures, Public, snap, Templates, Videos.

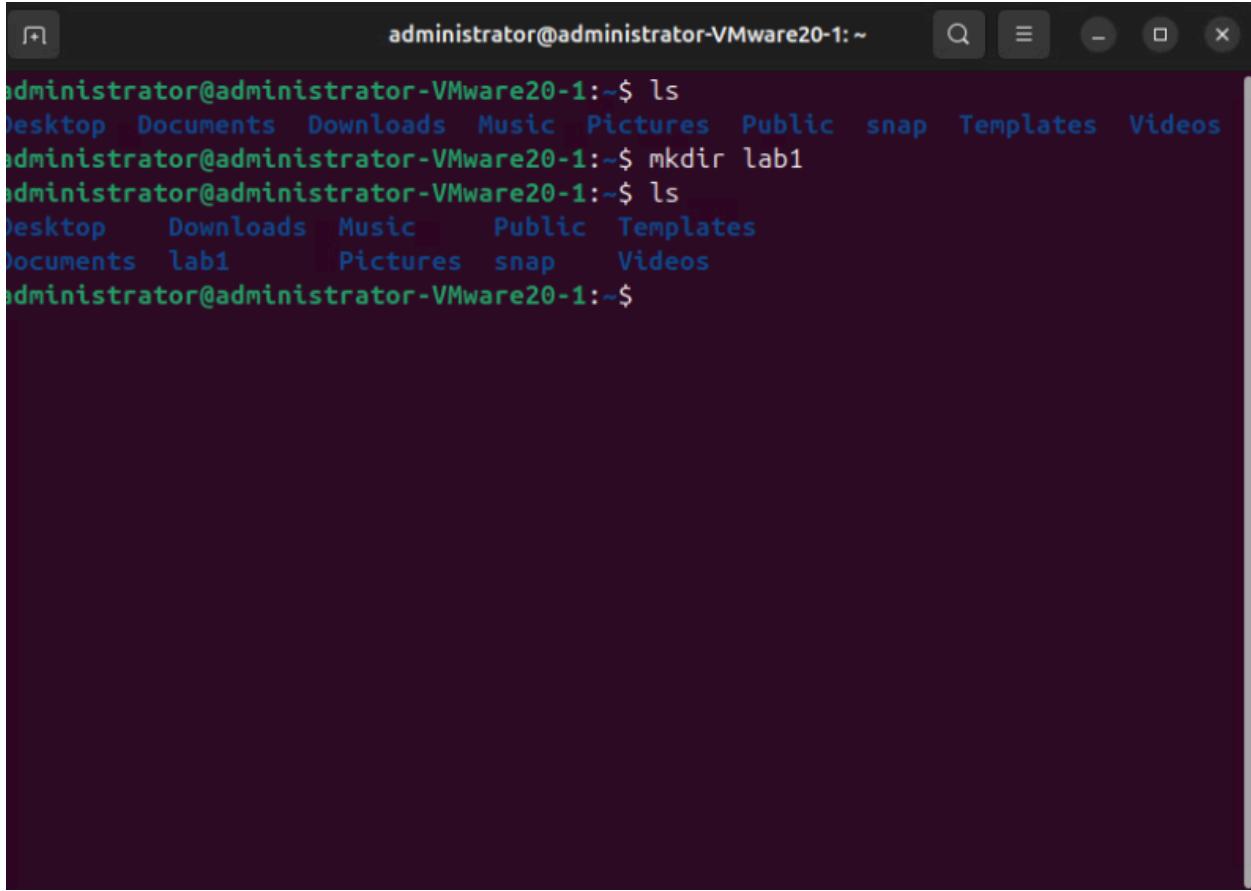


A screenshot of a dark-themed Ubuntu terminal window. The title bar shows "administrator@administrator-VMware20-1: ~". The terminal displays the command "ls" followed by a list of directories: Desktop, Documents, Downloads, Music, Pictures, Public, snap, Templates, and Videos. The prompt "administrator@administrator-VMware20-1:~\$" appears at the bottom.

```
administrator@administrator-VMware20-1:~$ ls
Desktop Documents Downloads Music Pictures Public snap Templates Videos
administrator@administrator-VMware20-1:~$
```

3. Create a directory called lab1 using `mkdir`. Type “`ls`”

What's the output? Desktop, Documents, Downloads, Music, lab1, Pictures, Public, snap, Templates, Videos.

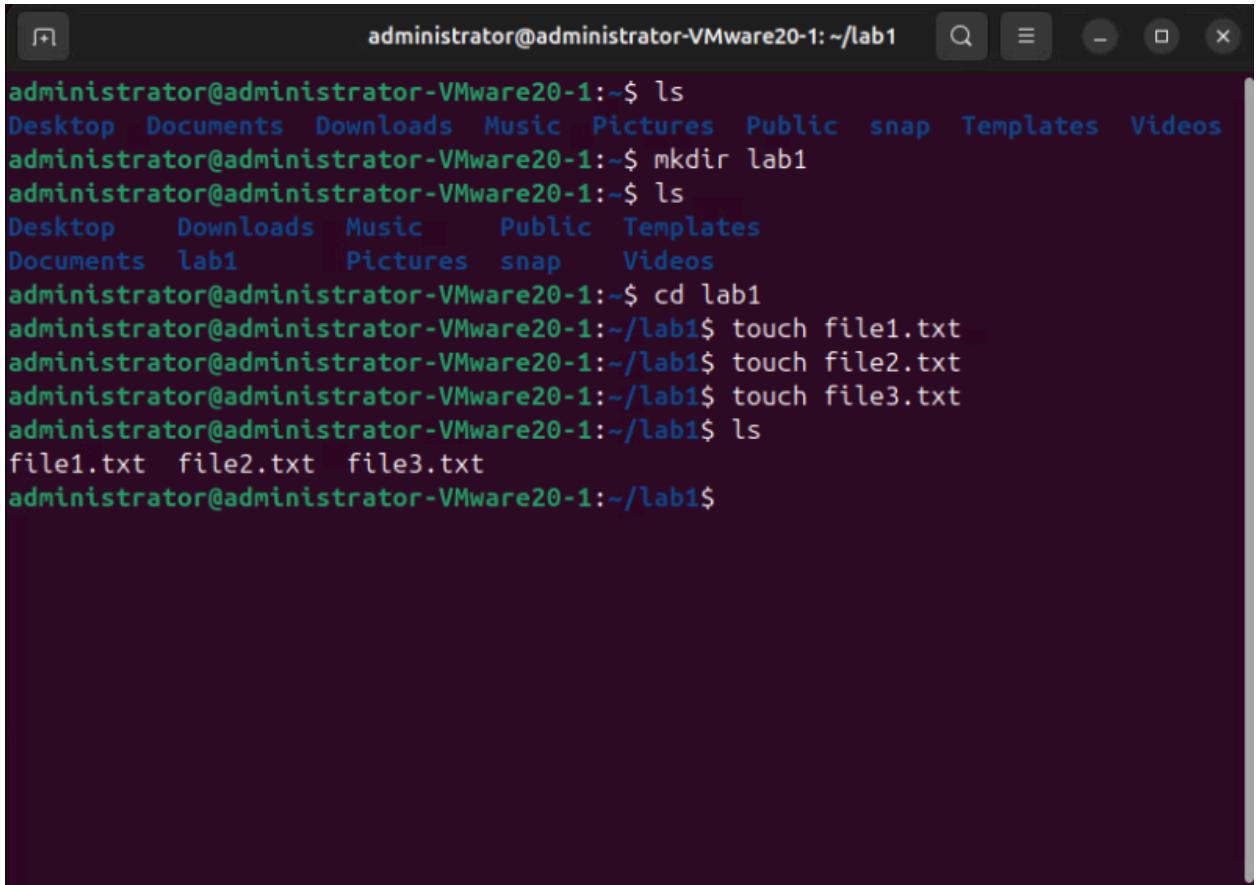
A screenshot of a terminal window titled "administrator@administrator-VMware20-1:~". The window contains the following command-line session:

```
administrator@administrator-VMware20-1:~$ ls
Desktop Documents Downloads Music Pictures Public snap Templates Videos
administrator@administrator-VMware20-1:~$ mkdir lab1
administrator@administrator-VMware20-1:~$ ls
Desktop Downloads Music Public Templates
Documents lab1 Pictures snap Videos
administrator@administrator-VMware20-1:~$
```

The terminal has a dark background with light-colored text. The title bar and window controls are visible at the top.

4. Within lab1, create three text files (file1.txt, file2.txt, and file3.txt) using `touch`.

What command did you use? `touch file1.txt, touch file2.txt, touch file3.txt`

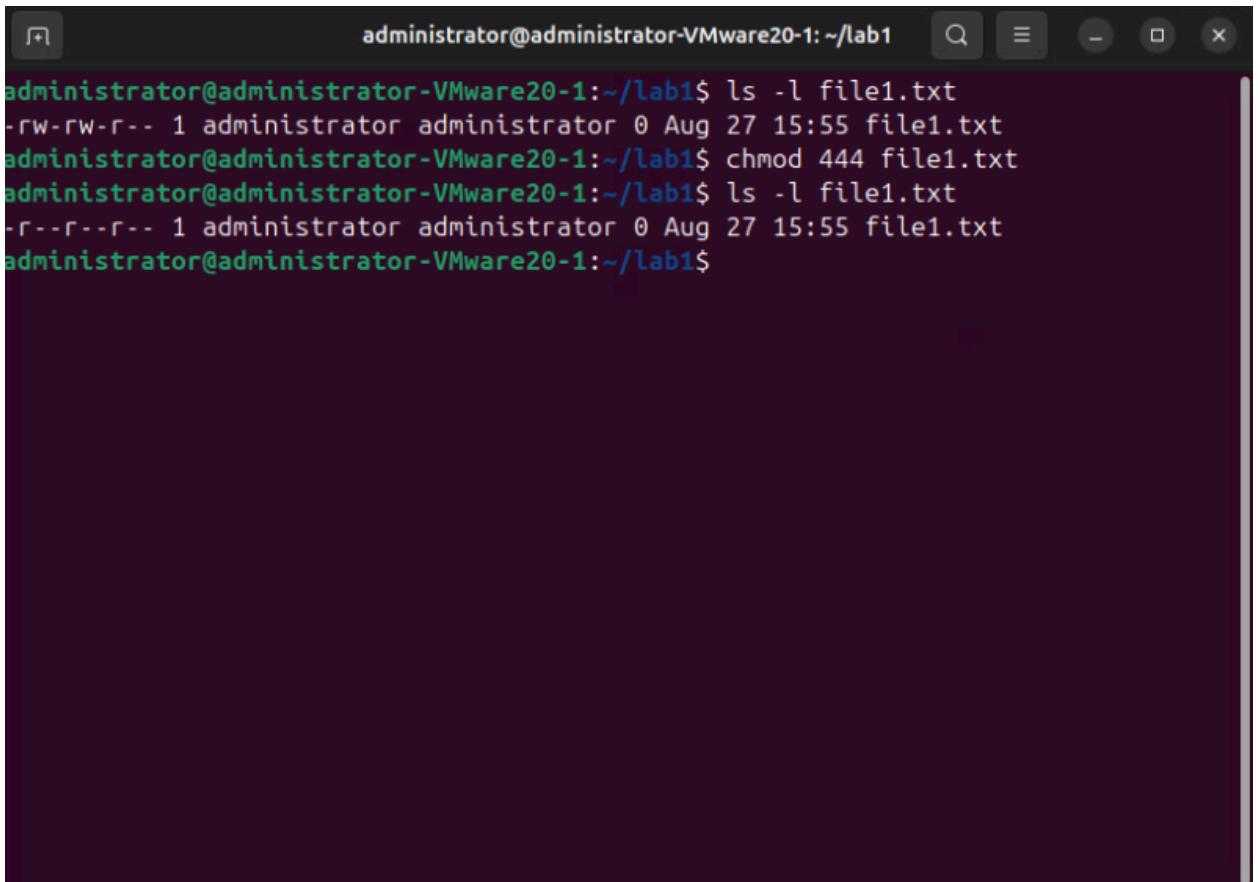


A screenshot of a terminal window titled "administrator@administrator-VMware20-1: ~/lab1". The terminal shows the following command-line session:

```
administrator@administrator-VMware20-1:~$ ls
Desktop Documents Downloads Music Pictures Public snap Templates Videos
administrator@administrator-VMware20-1:~$ mkdir lab1
administrator@administrator-VMware20-1:~$ ls
Desktop Downloads Music Public Templates
Documents lab1 Pictures snap Videos
administrator@administrator-VMware20-1:~$ cd lab1
administrator@administrator-VMware20-1:~/lab1$ touch file1.txt
administrator@administrator-VMware20-1:~/lab1$ touch file2.txt
administrator@administrator-VMware20-1:~/lab1$ touch file3.txt
administrator@administrator-VMware20-1:~/lab1$ ls
file1.txt file2.txt file3.txt
administrator@administrator-VMware20-1:~/lab1$
```

5. Check and note the permissions of `file1.txt` using `ls -l`. Change its permissions to read-only for all users using `chmod 444 file1.txt`. Verify the change with `ls -l`.

What is your output? -r--r-- 1 onworks 0 Aug27 18:56 file1.txt

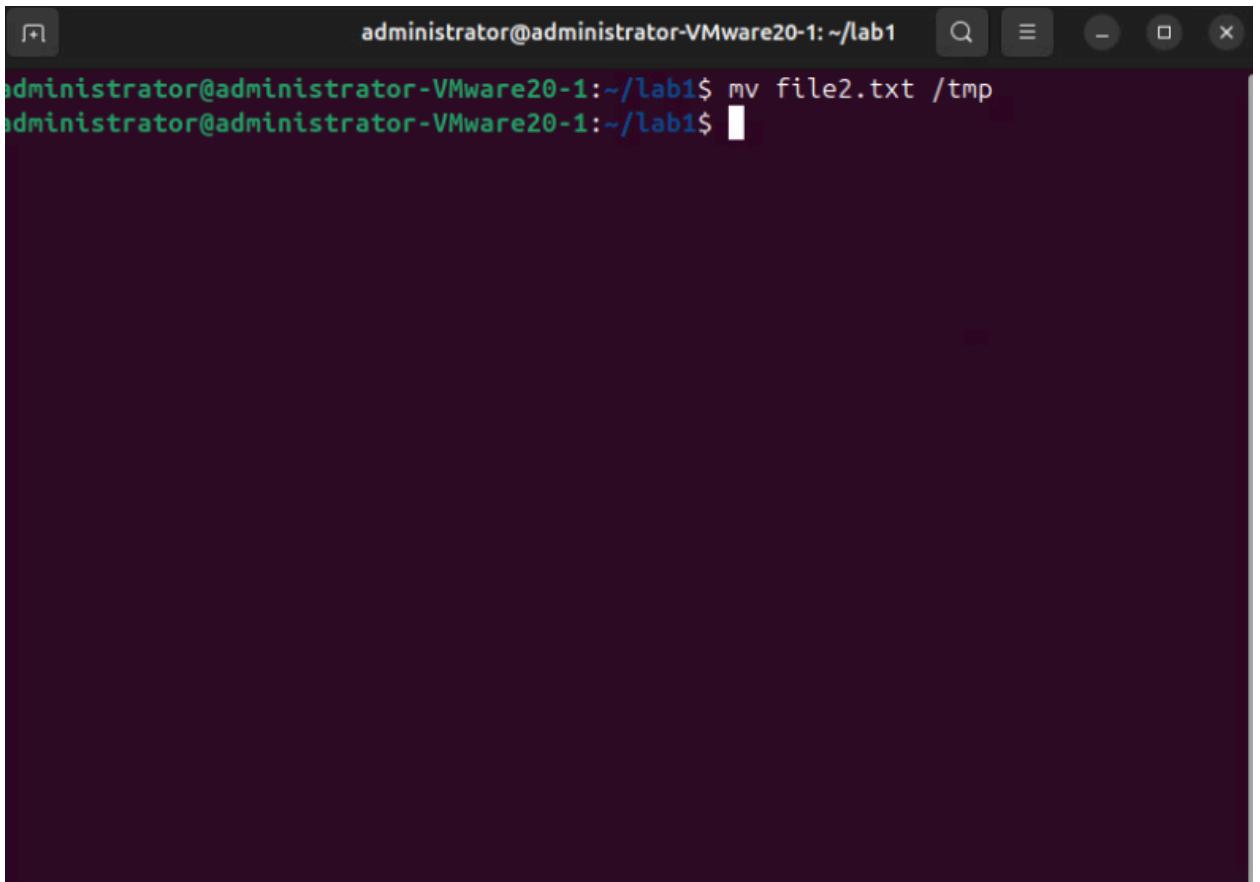


A screenshot of a terminal window titled "administrator@administrator-VMware20-1: ~/lab1". The window shows the following command-line session:

```
administrator@administrator-VMware20-1:~/lab1$ ls -l file1.txt
-rw-rw-r-- 1 administrator administrator 0 Aug 27 15:55 file1.txt
administrator@administrator-VMware20-1:~/lab1$ chmod 444 file1.txt
administrator@administrator-VMware20-1:~/lab1$ ls -l file1.txt
-r--r--r-- 1 administrator administrator 0 Aug 27 15:55 file1.txt
administrator@administrator-VMware20-1:~/lab1$
```

6. Move `file2.txt` to the `/tmp` directory using the `mv` command.

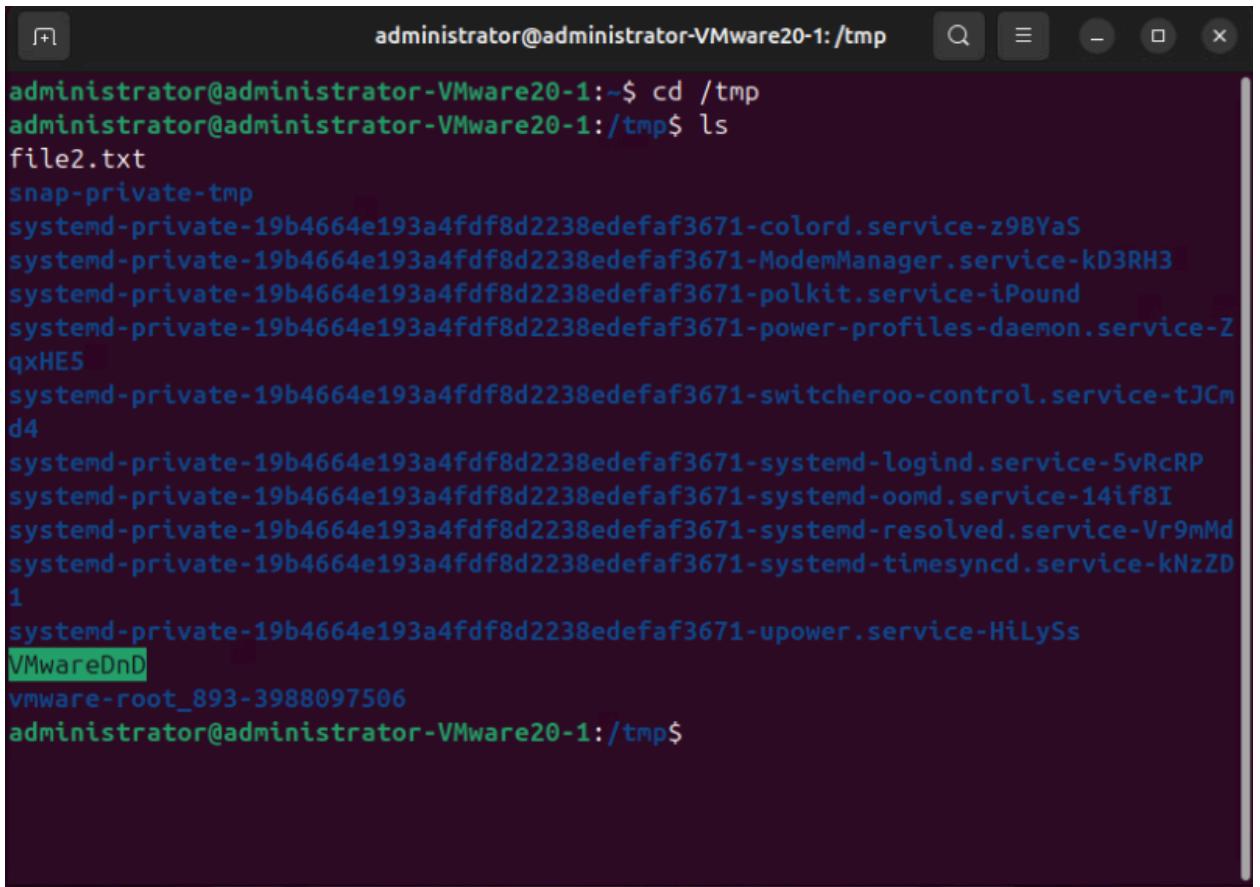
What command did you use? `mv file2.txt /tmp`



A screenshot of a terminal window titled "administrator@administrator-VMware20-1: ~/lab1". The window shows a single line of text: "administrator@administrator-VMware20-1:~/lab1\$ mv file2.txt /tmp". The background of the terminal is dark.

7. Confirm the file exists in /tmp by navigating there and listing the contents.

What command did you use? cd /tmp



```
administrator@administrator-VMware20-1:~/tmp$ cd /tmp
administrator@administrator-VMware20-1:/tmp$ ls
file2.txt
snap-private-tmp
systemd-private-19b4664e193a4fdf8d2238edefaf3671-colord.service-z9BYa5
systemd-private-19b4664e193a4fdf8d2238edefaf3671-ModemManager.service-kD3RH3
systemd-private-19b4664e193a4fdf8d2238edefaf3671-polkit.service-iPound
systemd-private-19b4664e193a4fdf8d2238edefaf3671-power-profiles-daemon.service-Z
qxHE5
systemd-private-19b4664e193a4fdf8d2238edefaf3671-swwitcheroo-control.service-tJCM
d4
systemd-private-19b4664e193a4fdf8d2238edefaf3671-systemd-logind.service-5vRcRP
systemd-private-19b4664e193a4fdf8d2238edefaf3671-systemd-oomd.service-14if8I
systemd-private-19b4664e193a4fdf8d2238edefaf3671-systemd-resolved.service-Vr9mMd
systemd-private-19b4664e193a4fdf8d2238edefaf3671-systemd-timesyncd.service-kNzZD
1
systemd-private-19b4664e193a4fdf8d2238edefaf3671-upower.service-HiLySs
VMwareDnD
vmware-root_893-3988097506
administrator@administrator-VMware20-1:/tmp$
```

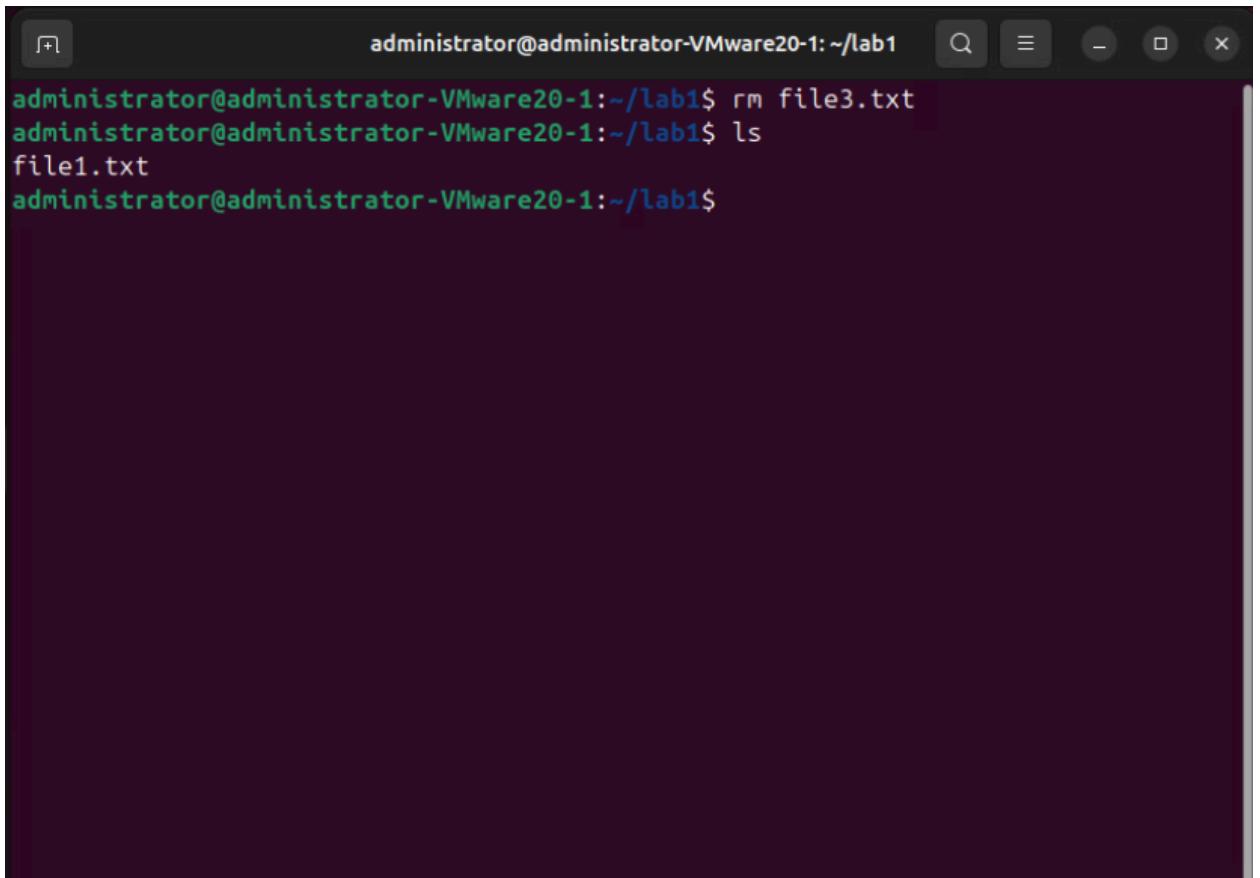
8. Delete file3.txt using rm.

What is your command and output?

rm file3.txt

ls

file1.txt



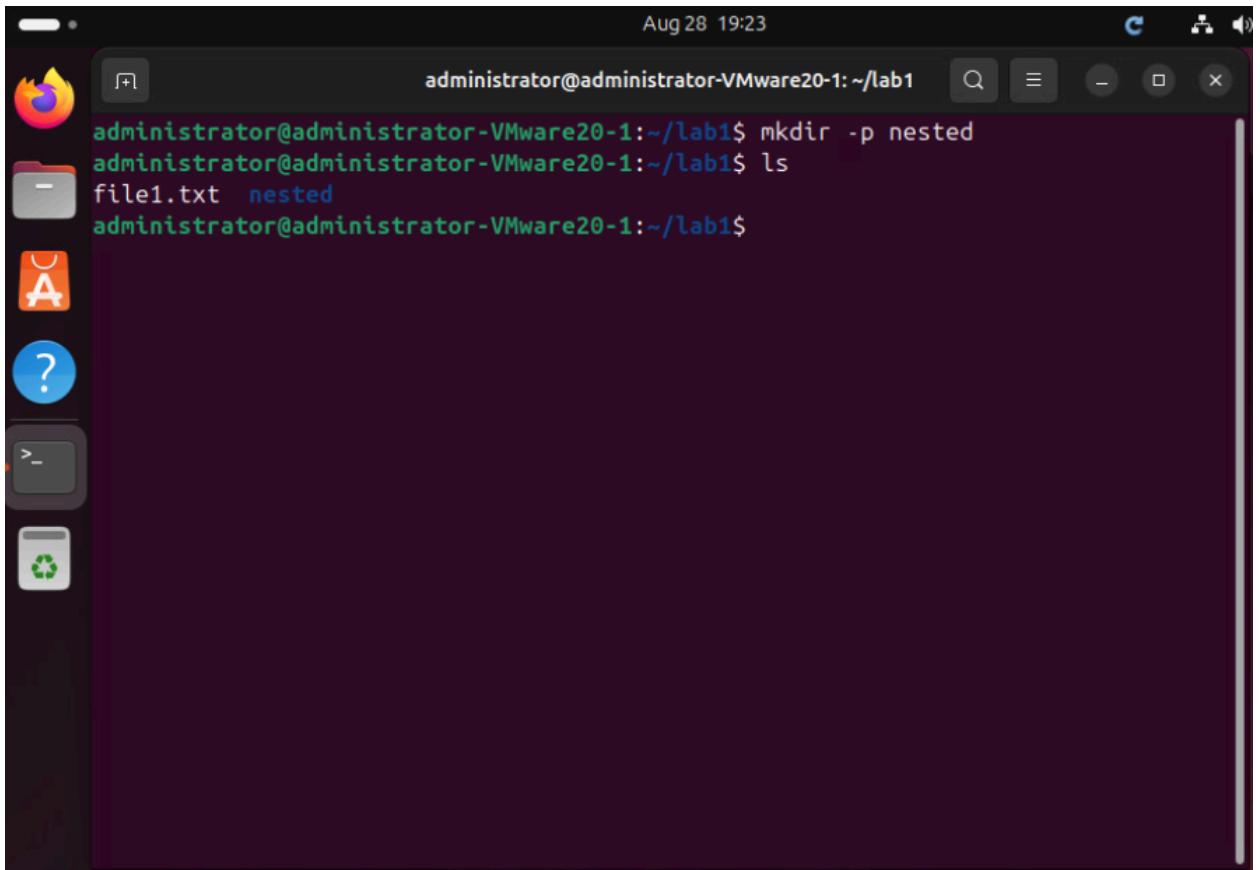
A screenshot of a terminal window titled "administrator@administrator-VMware20-1: ~/lab1". The window shows the following command history:

```
administrator@administrator-VMware20-1:~/lab1$ rm file3.txt
administrator@administrator-VMware20-1:~/lab1$ ls
file1.txt
administrator@administrator-VMware20-1:~/lab1$
```

9. Create a nested directory structure within lab1: nested/inside. Use `mkdir` with the `-p` flag.

What command did you use?

`mkdir -p nested`



A screenshot of a terminal window titled "administrator@administrator-VMware20-1: ~/lab1". The window shows the following command history:

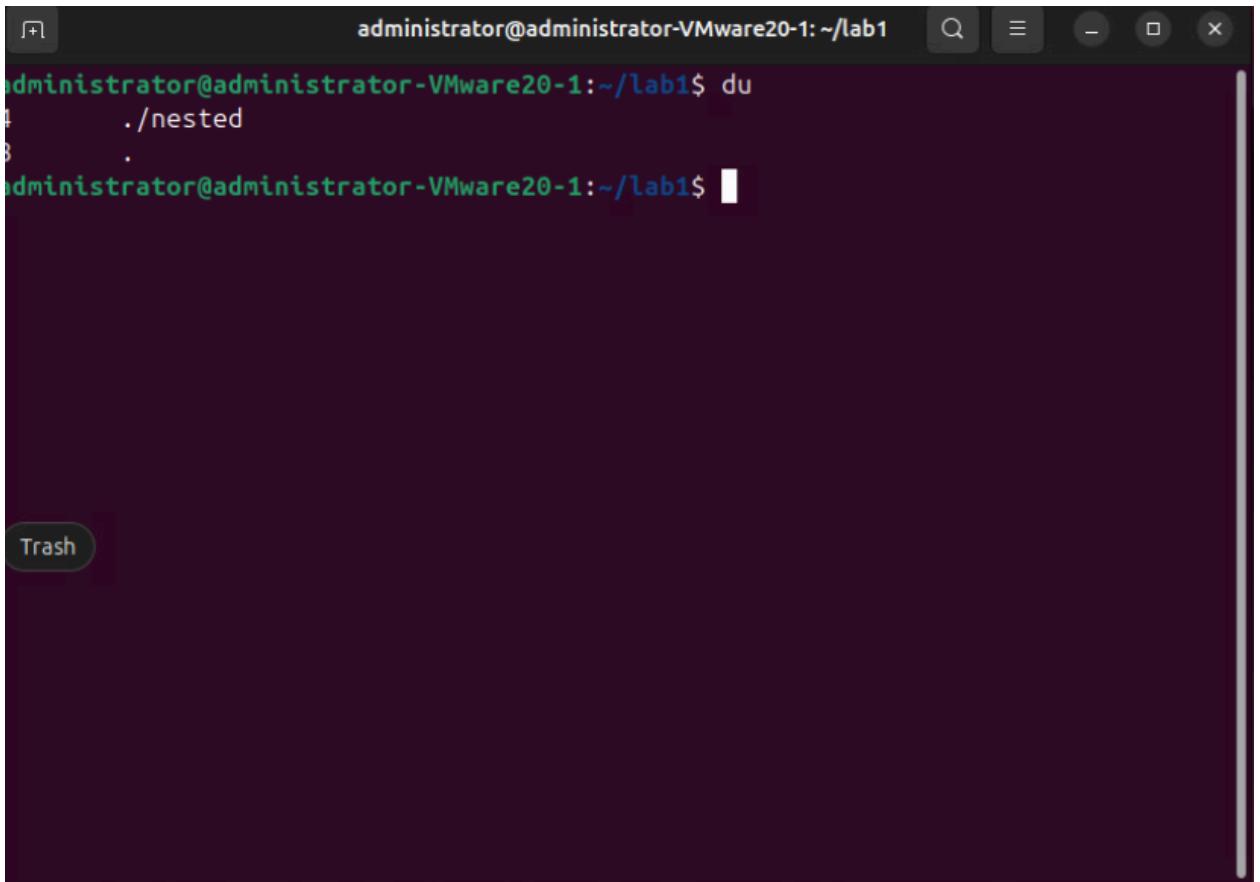
```
administrator@administrator-VMware20-1:~/lab1$ mkdir -p nested
administrator@administrator-VMware20-1:~/lab1$ ls
file1.txt nested
administrator@administrator-VMware20-1:~/lab1$
```

The terminal is part of a desktop environment, with a sidebar on the left containing icons for a browser, file manager, terminal, help, and system settings.

10. Use the `du` command to find the size of `lab1` and its subdirectories.

What command did you use?

`du`



The screenshot shows a terminal window titled "administrator@administrator-VMware20-1: ~/lab1". The terminal displays the following command and its output:

```
administrator@administrator-VMware20-1:~/lab1$ du
4      ./nested
3
administrator@administrator-VMware20-1:~/lab1$
```

The terminal window has a dark background and light-colored text. The title bar is at the top, and there are standard window control buttons (minimize, maximize, close) in the top right corner. A vertical scroll bar is visible on the right side of the terminal area.

11. Add a new user named student and set a password for this user. Log in as student using su student.

What command did you use?

sudo adduser student

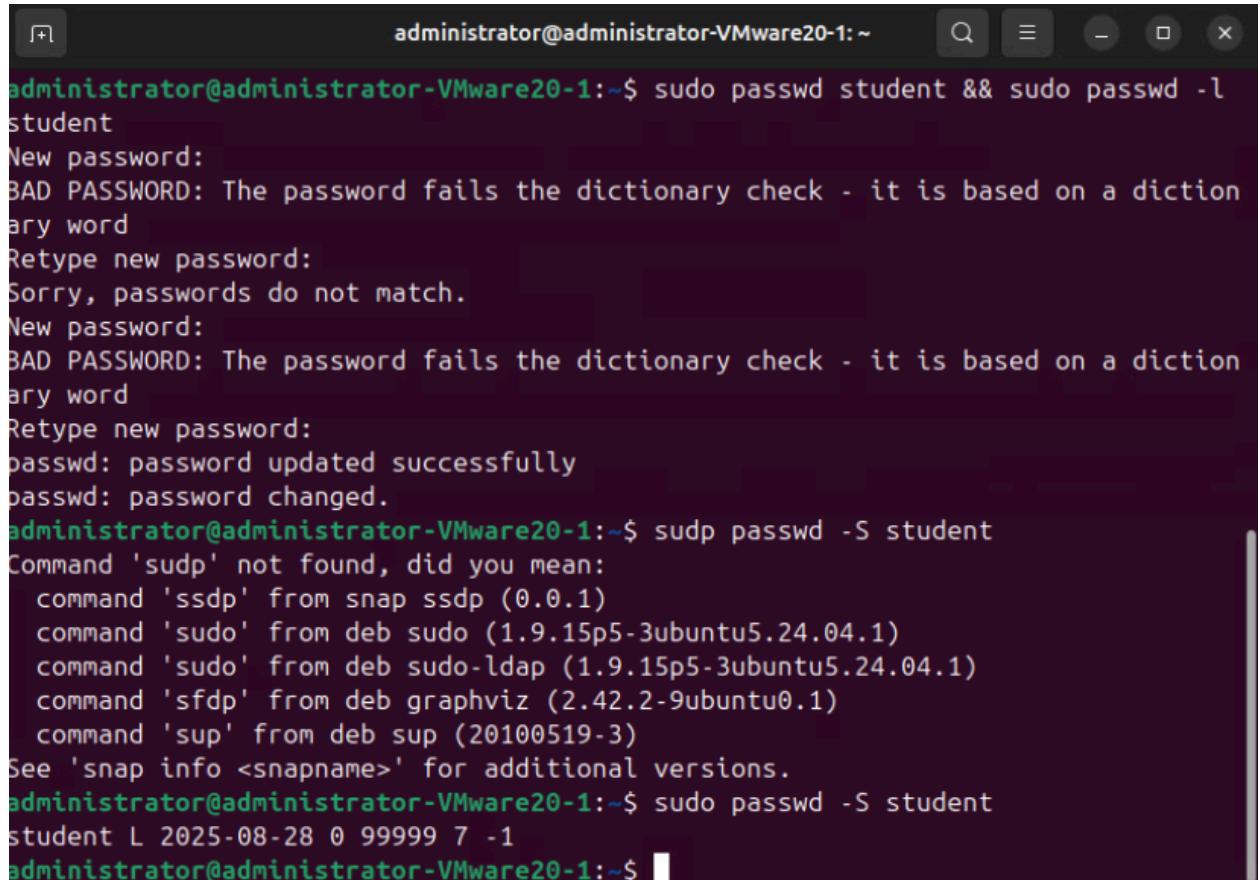
```
administrator@administrator-VMware20-1:~$ sudo adduser student
[sudo] password for administrator:
info: Adding user 'student' ...
info: Selecting UID/GID from range 1000 to 59999 ...
info: Adding new group 'student' (1001) ...
info: Adding new user 'student' (1001) with group 'student (1001)' ...
info: Creating home directory '/home/student' ...
info: Copying files from '/etc/skel' ...
[ Help ] [ Cancel ] [ Password: ]
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: password updated successfully
Changing the user information for student
Enter the new value, or press ENTER for the default
      Full Name []: student
      Room Number []: student
      Work Phone []: student
      Home Phone []: student
      Other []: student
Is the information correct? [Y/n] y
info: Adding new user 'student' to supplemental / extra groups 'users' ...
info: Adding user 'student' to group 'users' ...
administrator@administrator-VMware20-1:~$
```

12. Change the password for student to something new and lock their account. Verify the lock status.

What command did you use?

sudo passwd student && sudo passwd -l student

sudo passwd -S student



```
administrator@administrator-VMware20-1:~$ sudo passwd student && sudo passwd -l student
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
Sorry, passwords do not match.
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
passwd: password updated successfully
passwd: password changed.
administrator@administrator-VMware20-1:~$ sudp passwd -S student
Command 'sudp' not found, did you mean:
  command 'ssdp' from snap ssdp (0.0.1)
  command 'sudo' from deb sudo (1.9.15p5-3ubuntu5.24.04.1)
  command 'sudo' from deb sudo-ldap (1.9.15p5-3ubuntu5.24.04.1)
  command 'sfdp' from deb graphviz (2.42.2-9ubuntu0.1)
  command 'sup' from deb sup (20100519-3)
See 'snap info <snapname>' for additional versions.
administrator@administrator-VMware20-1:~$ sudo passwd -S student
student L 2025-08-28 0 99999 7 -1
administrator@administrator-VMware20-1:~$
```

Lab 2: Advanced Ubuntu Features

Objective: Master advanced Ubuntu commands for searching, archiving, and process management.

1. Create a file called `example.txt` with the following content:

“Ubuntu is a powerful and popular Linux distribution.

It is widely used in servers and desktops.

Ubuntu is easy to learn for beginners.”

The screenshot shows a terminal window with a dark background and light-colored text. At the top, it displays the user's name and host: administrator@administrator-VMware20-1:~. The window has standard Linux-style window controls (minimize, maximize, close) in the top right corner. The terminal session shows the following commands and output:

```
administrator@administrator-VMware20-1:~$ nano example.txt
administrator@administrator-VMware20-1:~$ cat example.txt
Ubuntu is a powerful and popular Linux distribution.
It is widely used in servers and desktops.
Ubuntu is easy to learn for beginners.
administrator@administrator-VMware20-1:~$
```

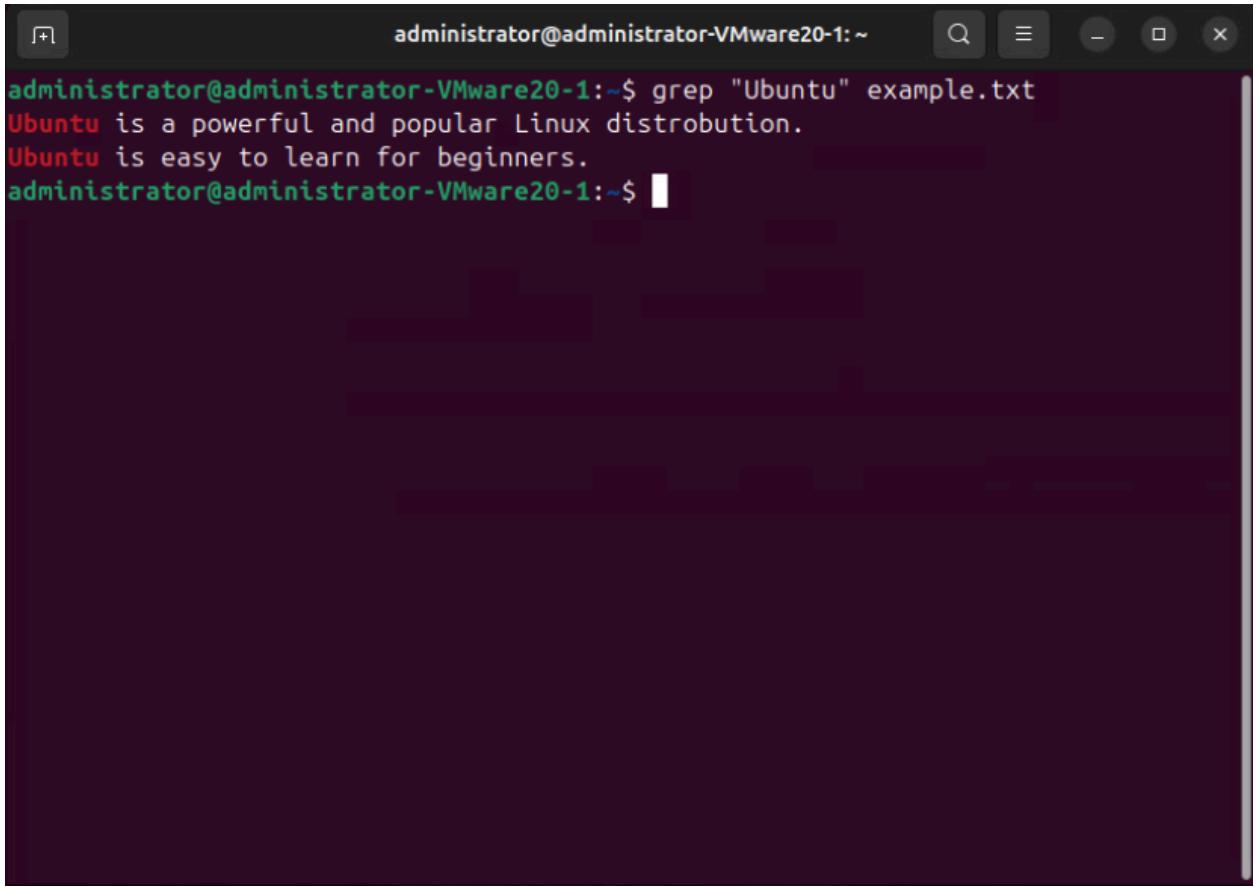
2. Use **grep** to search for the word "Ubuntu" in example.txt.

What command did you use? What is your output?

grep “Ubuntu” example.txt

Ubuntu is a powerful and popular Linux distribution.

Ubuntu is easy to learn for beginners.



The screenshot shows a terminal window with a dark background and light-colored text. The title bar reads "administrator@administrator-VMware20-1: ~". The command entered was "grep "Ubuntu" example.txt". The output shows two lines of text from the file: "Ubuntu is a powerful and popular Linux distribution." and "Ubuntu is easy to learn for beginners.". The terminal window has standard operating system window controls at the top right.

```
administrator@administrator-VMware20-1:~$ grep "Ubuntu" example.txt
Ubuntu is a powerful and popular Linux distribution.
Ubuntu is easy to learn for beginners.
administrator@administrator-VMware20-1:~$
```

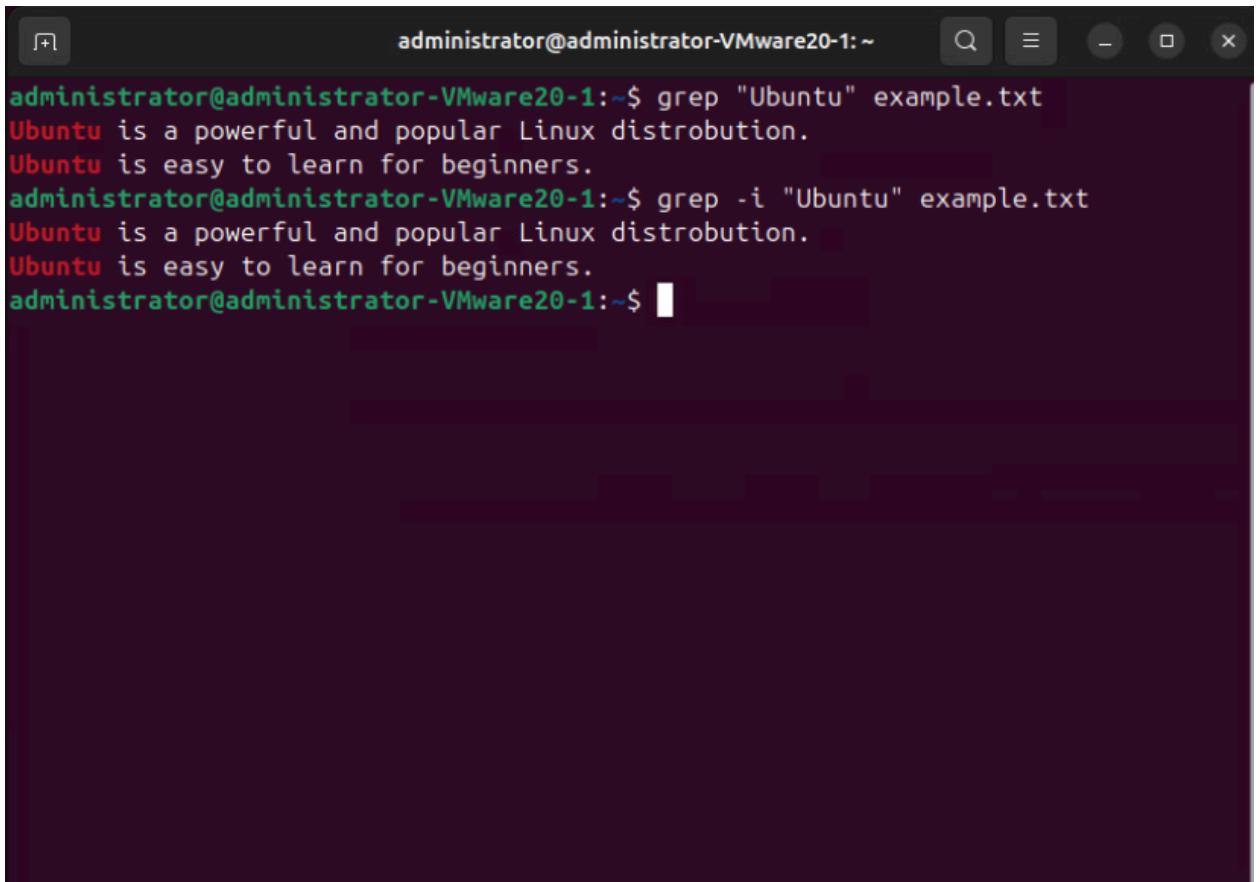
3. Modify the search to ignore case sensitivity using an appropriate flag.

What command did you use? What is your output?

grep -i “Ubuntu” example.txt

Ubuntu is a powerful and popular Linux distribution.

Ubuntu is easy to learn for beginners.



A screenshot of a terminal window titled "administrator@administrator-VMware20-1:~". The window contains the following text:

```
administrator@administrator-VMware20-1:~$ grep "Ubuntu" example.txt
Ubuntu is a powerful and popular Linux distribution.
Ubuntu is easy to learn for beginners.
administrator@administrator-VMware20-1:~$ grep -i "Ubuntu" example.txt
Ubuntu is a powerful and popular Linux distribution.
Ubuntu is easy to learn for beginners.
administrator@administrator-VMware20-1:~$
```

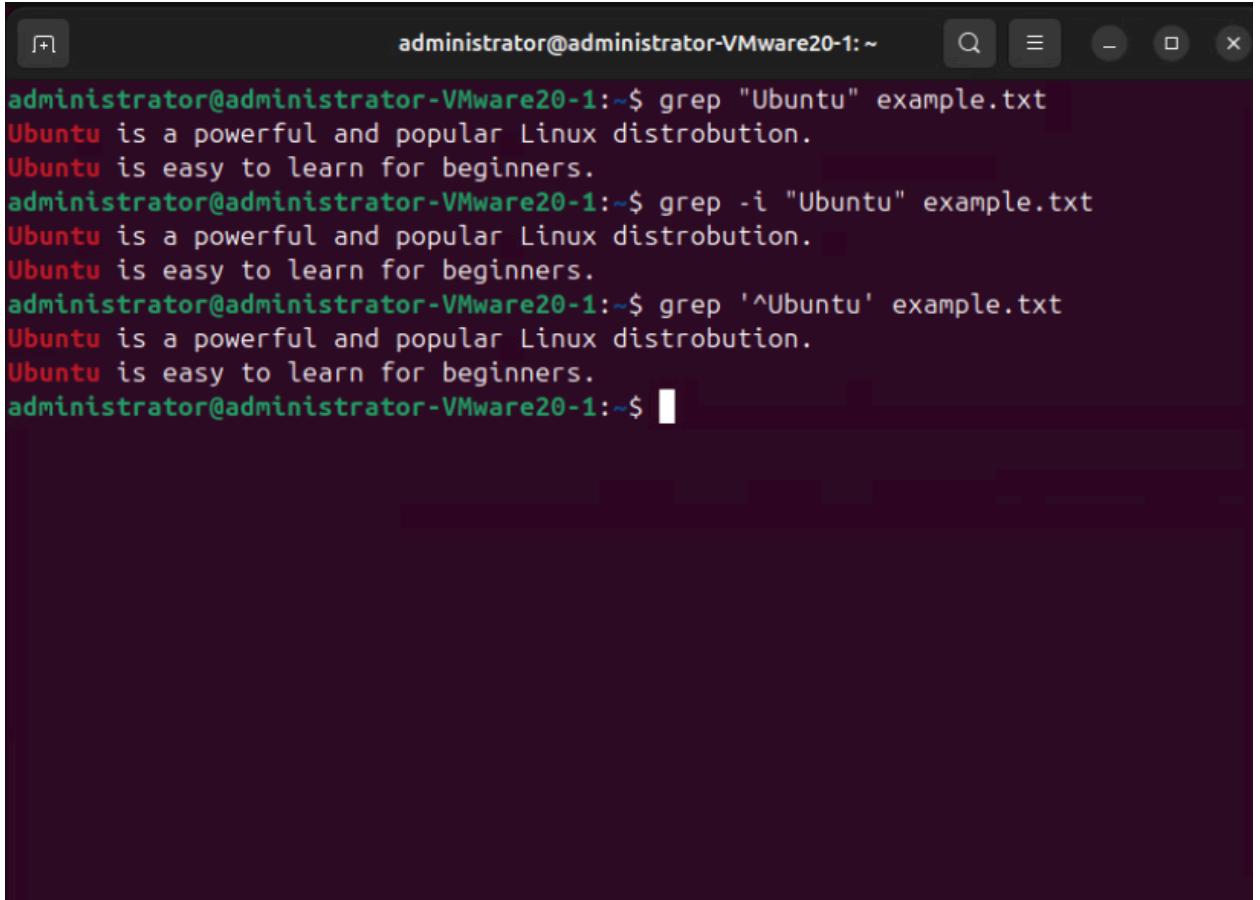
4. Find all lines in example.txt that begin with "Ubuntu" using grep and regex.

What command did you use? What is your output?

grep '^Ubuntu' example.txt

Ubuntu is a powerful and popular Linux distribution.

Ubuntu is easy to learn for beginners.



A screenshot of a terminal window titled "administrator@administrator-VMware20-1:~". The terminal displays three commands using the grep command:

- `administrator@administrator-VMware20-1:~$ grep "Ubuntu" example.txt`
- `Ubuntu` is a powerful and popular Linux distribution.
- `Ubuntu` is easy to learn for beginners.
- `administrator@administrator-VMware20-1:~$ grep -i "Ubuntu" example.txt`
- `Ubuntu` is a powerful and popular Linux distribution.
- `Ubuntu` is easy to learn for beginners.
- `administrator@administrator-VMware20-1:~$ grep '^Ubuntu' example.txt`
- `Ubuntu` is a powerful and popular Linux distribution.
- `Ubuntu` is easy to learn for beginners.
- `administrator@administrator-VMware20-1:~$`

5. Compress the example.txt file using gzip (`gzip example.txt`). List the contents of the directory to confirm the compressed file.

What command did you use? What is your output?

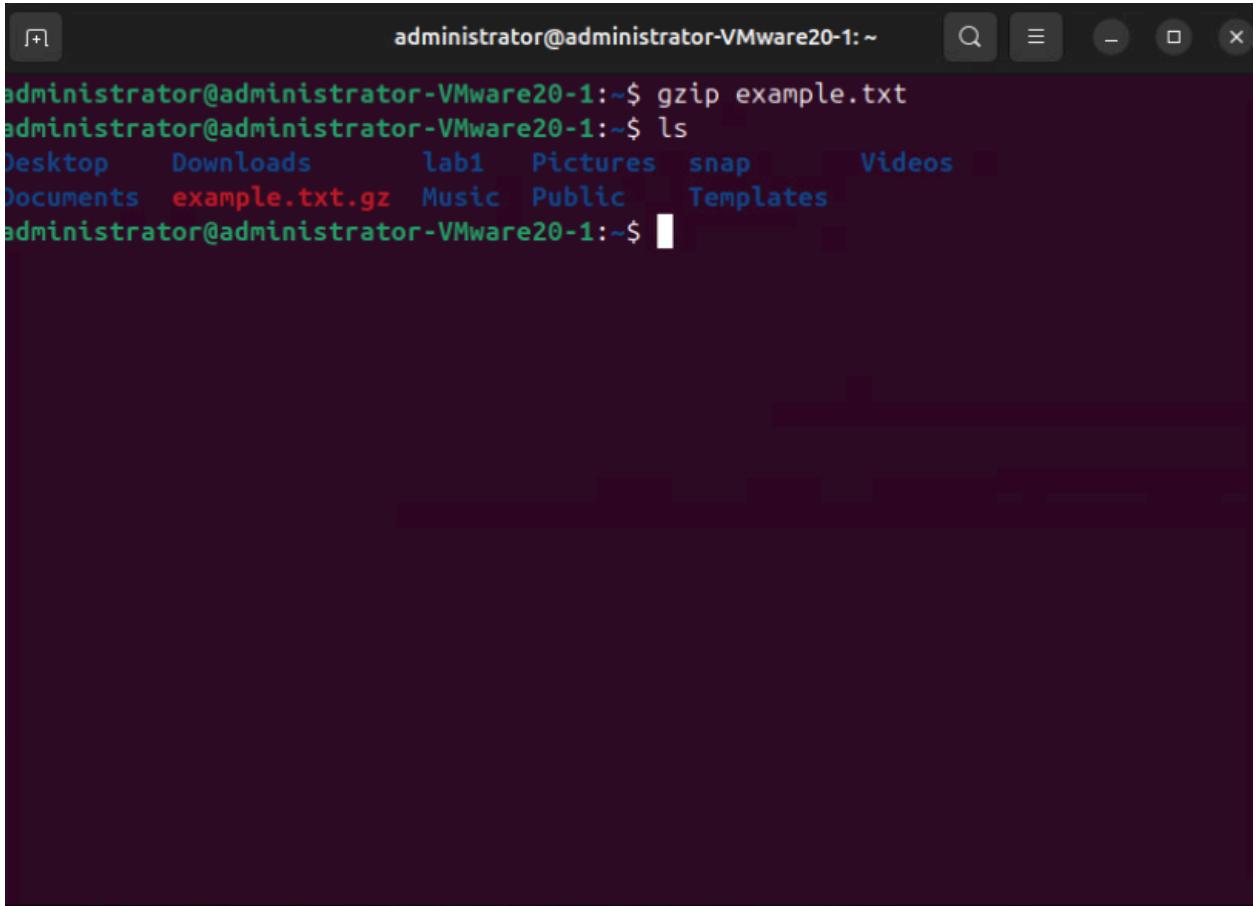
6. Decompress the file using gunzip.

What command did you use?

gzip example.txt

ls

example.txt.gz



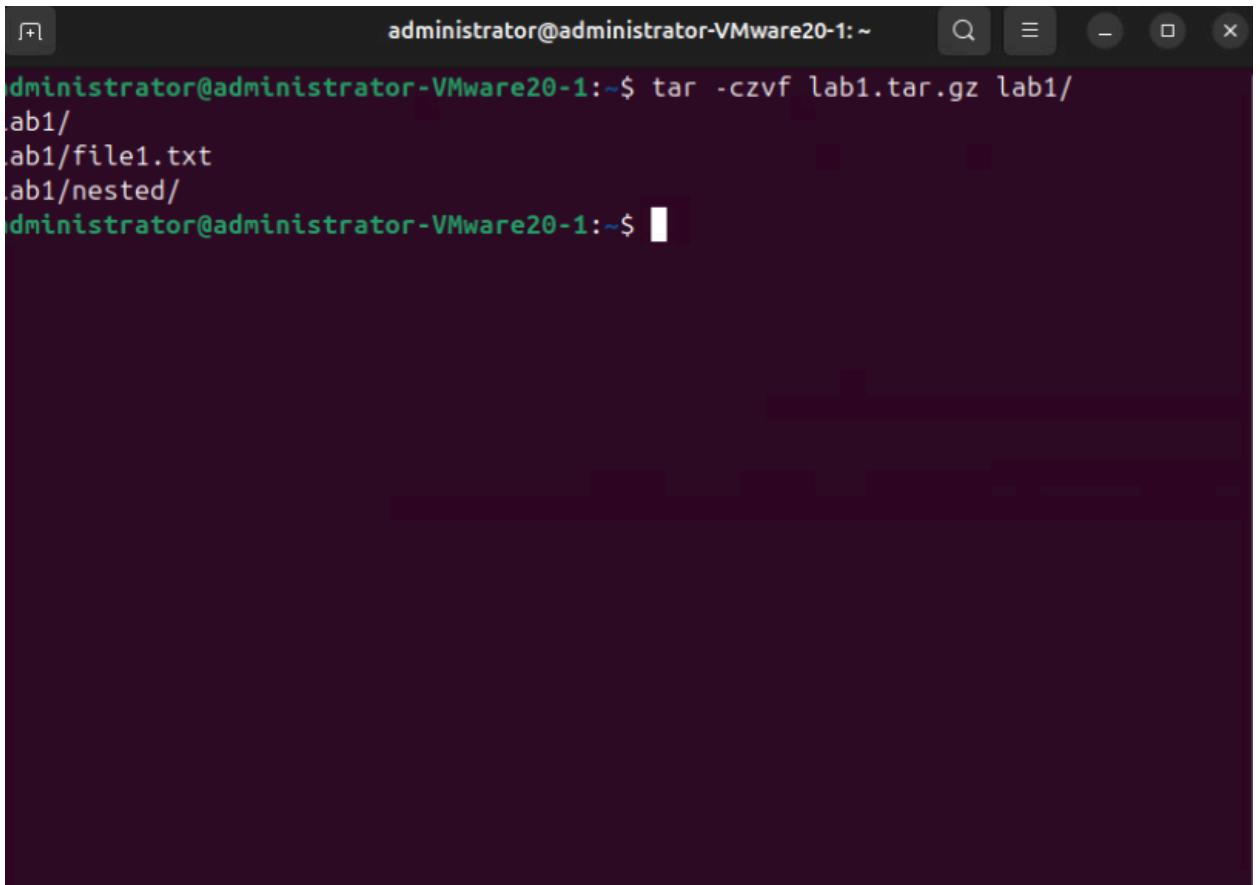
A screenshot of a terminal window titled "administrator@administrator-VMware20-1:~". The terminal shows the following command and its output:

```
administrator@administrator-VMware20-1:~$ gzip example.txt
administrator@administrator-VMware20-1:~$ ls
Desktop  Downloads  lab1  Pictures  snap      Videos
Documents  example.txt.gz  Music  Public    Templates
administrator@administrator-VMware20-1:~$
```

7. Create a tar archive of the lab1 directory and compress it using gzip.

What command did you use?

`tar -czvf lab1.tar.gz lab1/`



```
administrator@administrator-VMware20-1:~$ tar -czvf lab1.tar.gz lab1/
lab1/
lab1/file1.txt
lab1/nested/
administrator@administrator-VMware20-1:~$
```

8. Extract the `tar.gz` file to confirm its contents.

What commands did you use?

`tar -xzvf lab1.tar.gz`

```

administrator@administrator-VMware20-1:~$ tar -czvf lab1.tar.gz lab1/
lab1/
lab1/file1.txt
lab1/nested/
administrator@administrator-VMware20-1:~$ tar -xzvf lab1.tar.gz
lab1/
lab1/file1.txt
lab1/nested/
administrator@administrator-VMware20-1:~$ 

```

9. Use ps aux to list all processes. Identify the most resource-intensive process.

What is your output? adminis+ 4701 0.0 2.1 676484 175032 ? SNI Aug27 0:03 /usr/bin/pyth

User	PPID	RSS	CPUTIME	COMMAND
adminis+	3037	0.0	0.1	710284 14492 ?
adminis+	3044	0.0	0.2	275540 24148 ?
adminis+	3049	0.0	0.0	244940 6612 ?
adminis+	3054	0.0	0.3	816952 26066 ?
adminis+	3055	0.0	1.0	1085868 87852 ?
adminis+	3061	0.0	1.2	1257094 98240 ?
adminis+	3104	0.0	0.3	426456 26140 ?
adminis+	3458	0.0	0.7	2881744 61944 ?
adminis+	3569	0.0	0.3	651140 31584 ?
root	3785	0.0	0.5	602272 43194 ?
adminis+	4701	0.0	2.1	676484 175032 ?
root	5295	0.0	0.1	47504 12748 ?
cups-br+	5298	0.0	0.2	268880 26292 ?
root	8417	0.0	0.2	50400 17224 ?
systemd+	8584	0.0	0.0	91044 7852 ?
root	8775	0.0	0.1	30540 8684 ?
root	8779	0.0	0.0	0 0 ?
systemd+	8927	0.0	0.0	17556 7748 ?
systemd+	9223	0.0	0.1	21672 13460 ?
root	20856	0.0	0.1	56064 12484 ?
root	20858	0.1	0.1	318732 9792 ?
root	21062	0.0	0.0	152476 1412 ?
root	25785	0.0	0.0	0 0 ?
root	25922	0.0	0.0	0 0 ?
root	25929	0.0	0.1	469604 14488 ?
syslog	26245	0.0	0.0	222564 5508 ?
root	38239	0.0	0.0	0 0 ?
root	38307	0.0	0.0	0 0 ?
root	38426	0.0	0.0	0 0 ?
root	38503	0.0	0.0	0 0 ?
root	38506	0.0	0.0	0 0 ?
root	38521	0.0	0.0	0 0 ?
adminis+	38582	0.0	0.2	31984 19360 ?
adminis+	38585	0.0	0.3	458972 29344 ?
				S 19:24 0:00 /usr/bin/pyth
				Sl 19:24 0:00 /usr/bin/gnom

10. Use kill to terminate a dummy process you create (e.g., running sleep 1000 in another terminal).

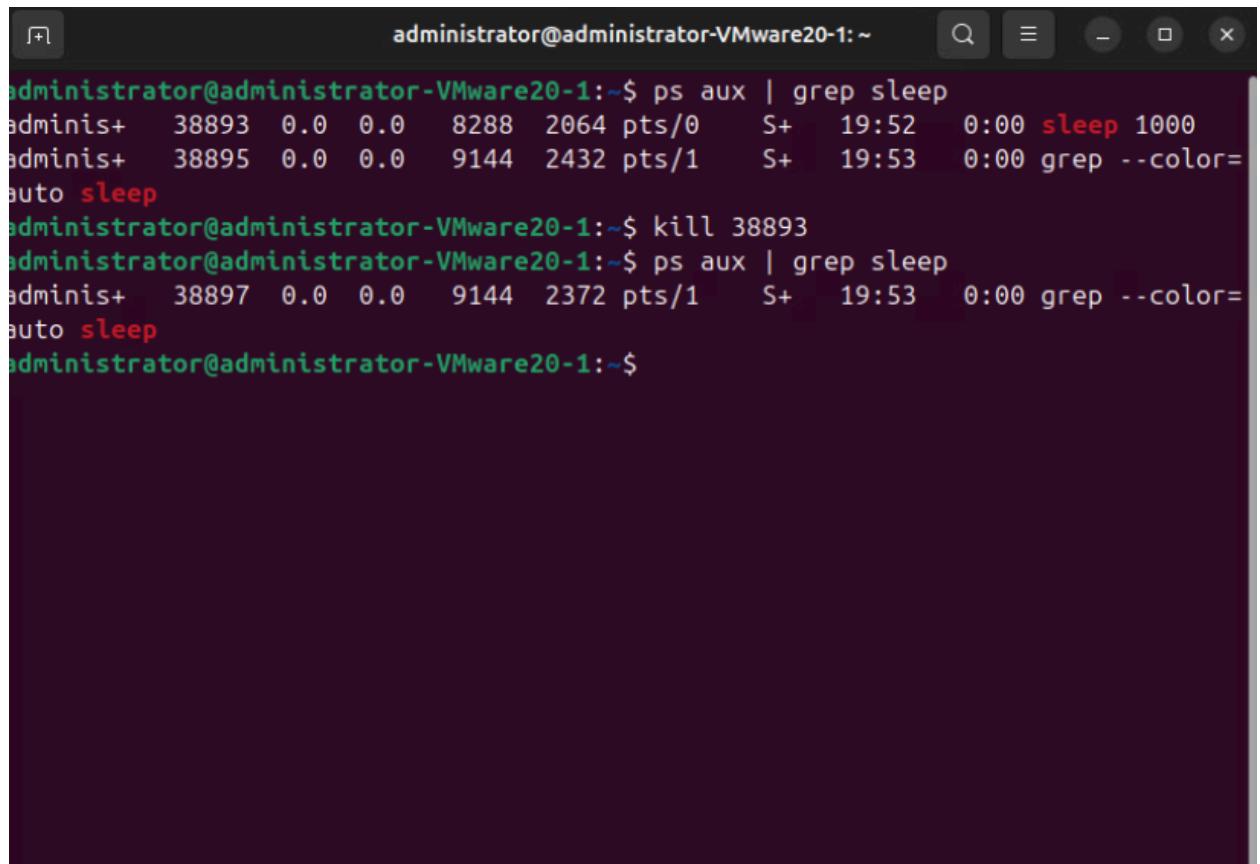
What is your output?

sleep 1000

ps aux | grep sleep

kill 38893

ps aux | grep sleep



```
administrator@administrator-VMware20-1:~$ ps aux | grep sleep
adminis+ 38893 0.0 0.0 8288 2064 pts/0 S+ 19:52 0:00 sleep 1000
adminis+ 38895 0.0 0.0 9144 2432 pts/1 S+ 19:53 0:00 grep --color=auto sleep
administrator@administrator-VMware20-1:~$ kill 38893
administrator@administrator-VMware20-1:~$ ps aux | grep sleep
adminis+ 38897 0.0 0.0 9144 2372 pts/1 S+ 19:53 0:00 grep --color=auto sleep
administrator@administrator-VMware20-1:~$
```

Submission: Submit a single Word or PDF document with:

- The answers to the questions highlighted with blue font.
 - Screenshots showing the output of each step.
-