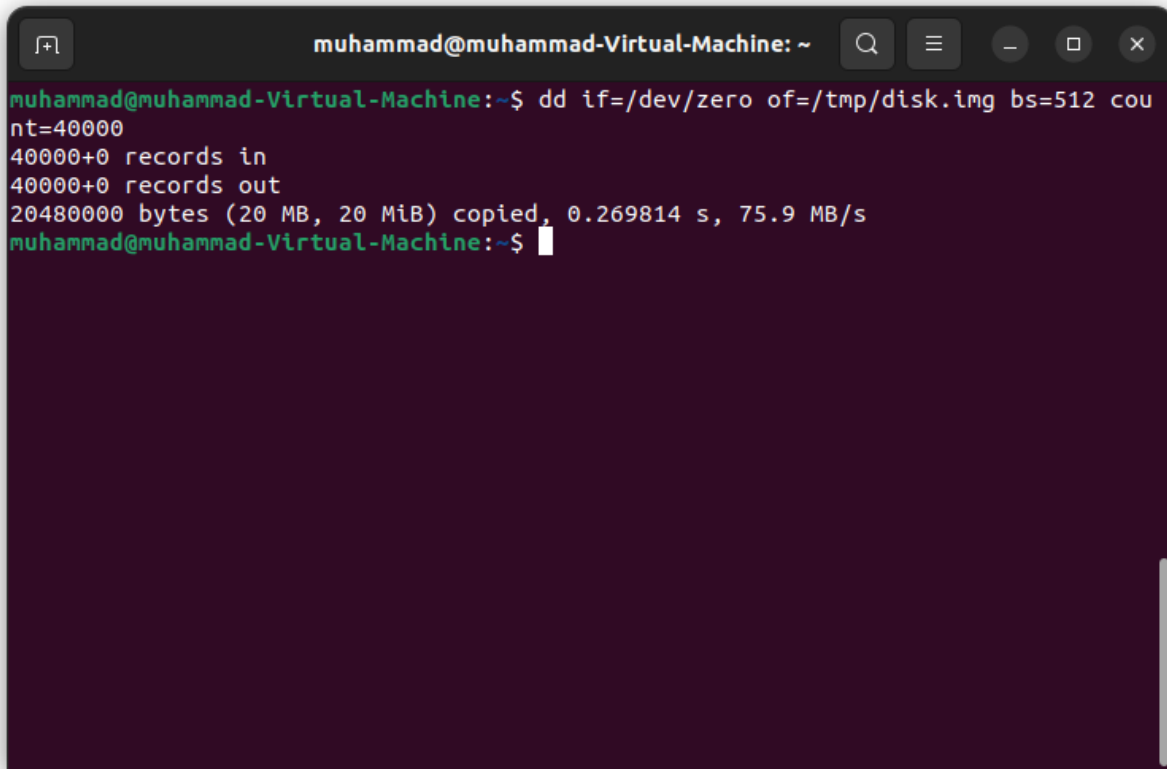


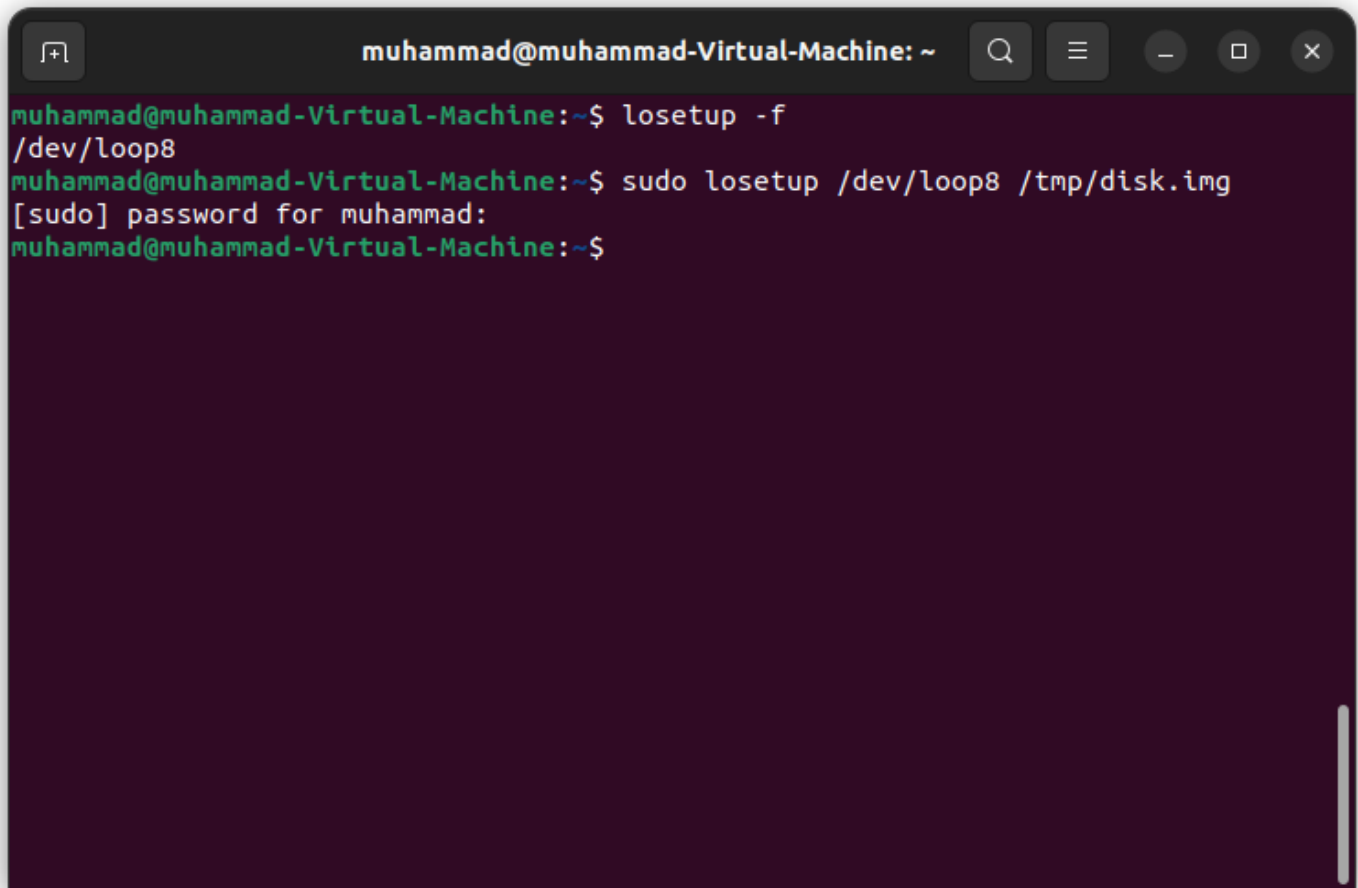
- using `dd` command create empty file with size of 20MB (hint: count 40000, bs=512)



```
muhammad@muhammad-Virtual-Machine: ~  
muhammad@muhammad-Virtual-Machine:~$ dd if=/dev/zero of=/tmp/disk.img bs=512 count=40000  
40000+0 records in  
40000+0 records out  
20480000 bytes (20 MB, 20 MiB) copied, 0.269814 s, 75.9 MB/s  
muhammad@muhammad-Virtual-Machine:~$
```

•

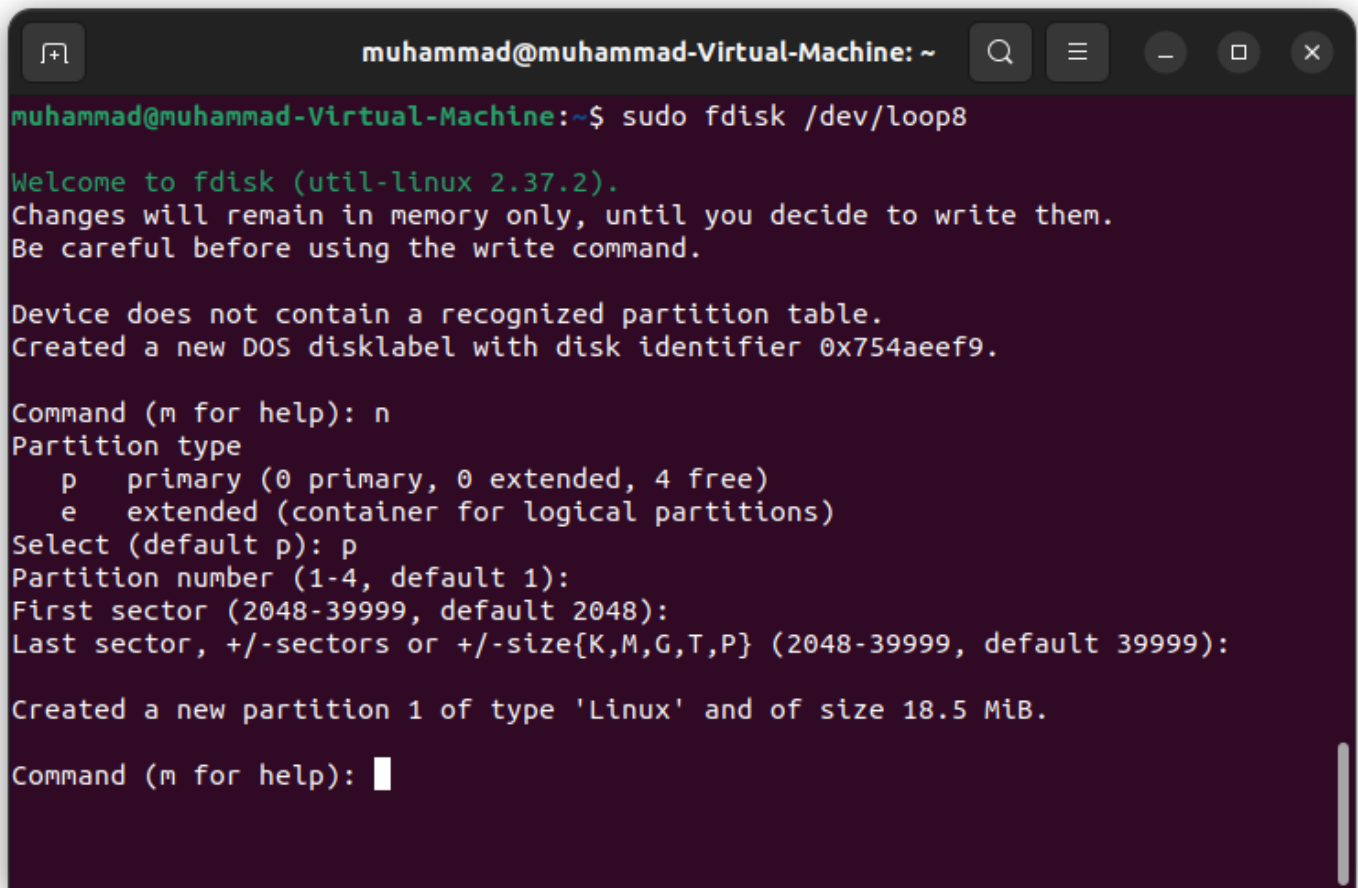
attach the file as loop device using `losetup` command (hint: use `losetup -f` to allocate free device)



```
muhammad@muhammad-Virtual-Machine: ~  
muhammad@muhammad-Virtual-Machine:~$ losetup -f  
/dev/loop8  
muhammad@muhammad-Virtual-Machine:~$ sudo losetup /dev/loop8 /tmp/disk.img  
[sudo] password for muhammad:  
muhammad@muhammad-Virtual-Machine:~$
```

•

using `fdisk` command, create new partition into the loop device (`fdisk /dev/loop<??>` where `<??>` is the device number)

A terminal window titled 'muhammad@muhammad-Virtual-Machine: ~' with standard window controls. The terminal shows the execution of 'sudo fdisk /dev/loop8'. It displays the fdisk welcome message, the creation of a new DOS disklabel, and the creation of a new primary partition (1) of type 'Linux' with a size of 18.5 MiB. The prompt 'Command (m for help):' is shown at the bottom with a cursor.

```
muhammad@muhammad-Virtual-Machine:~$ sudo fdisk /dev/loop8

Welcome to fdisk (util-linux 2.37.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0x754aeef9.

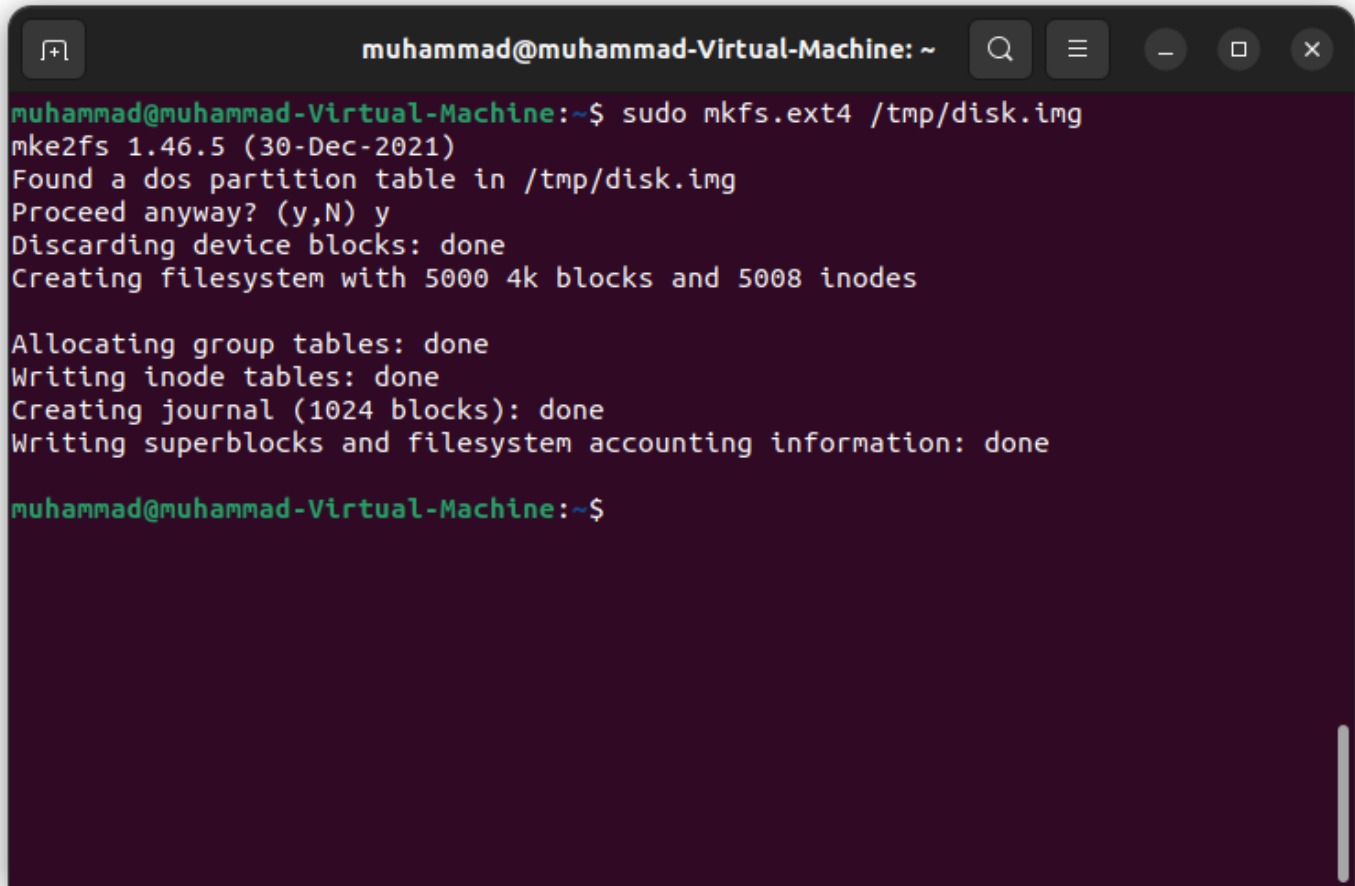
Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1):
First sector (2048-39999, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-39999, default 39999):

Created a new partition 1 of type 'Linux' and of size 18.5 MiB.

Command (m for help):
```

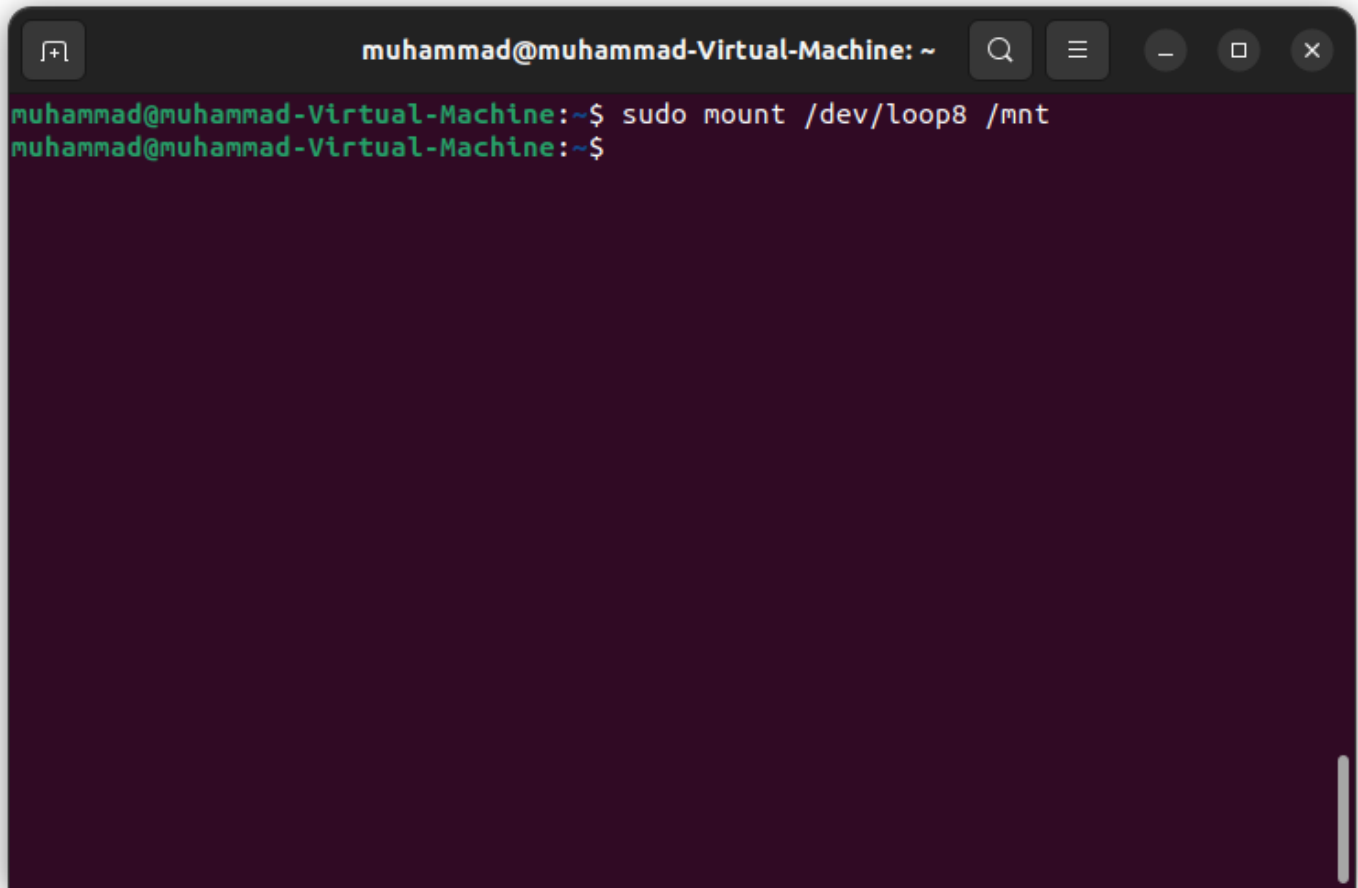
•

format the new partition using `mkfs.ext4` command



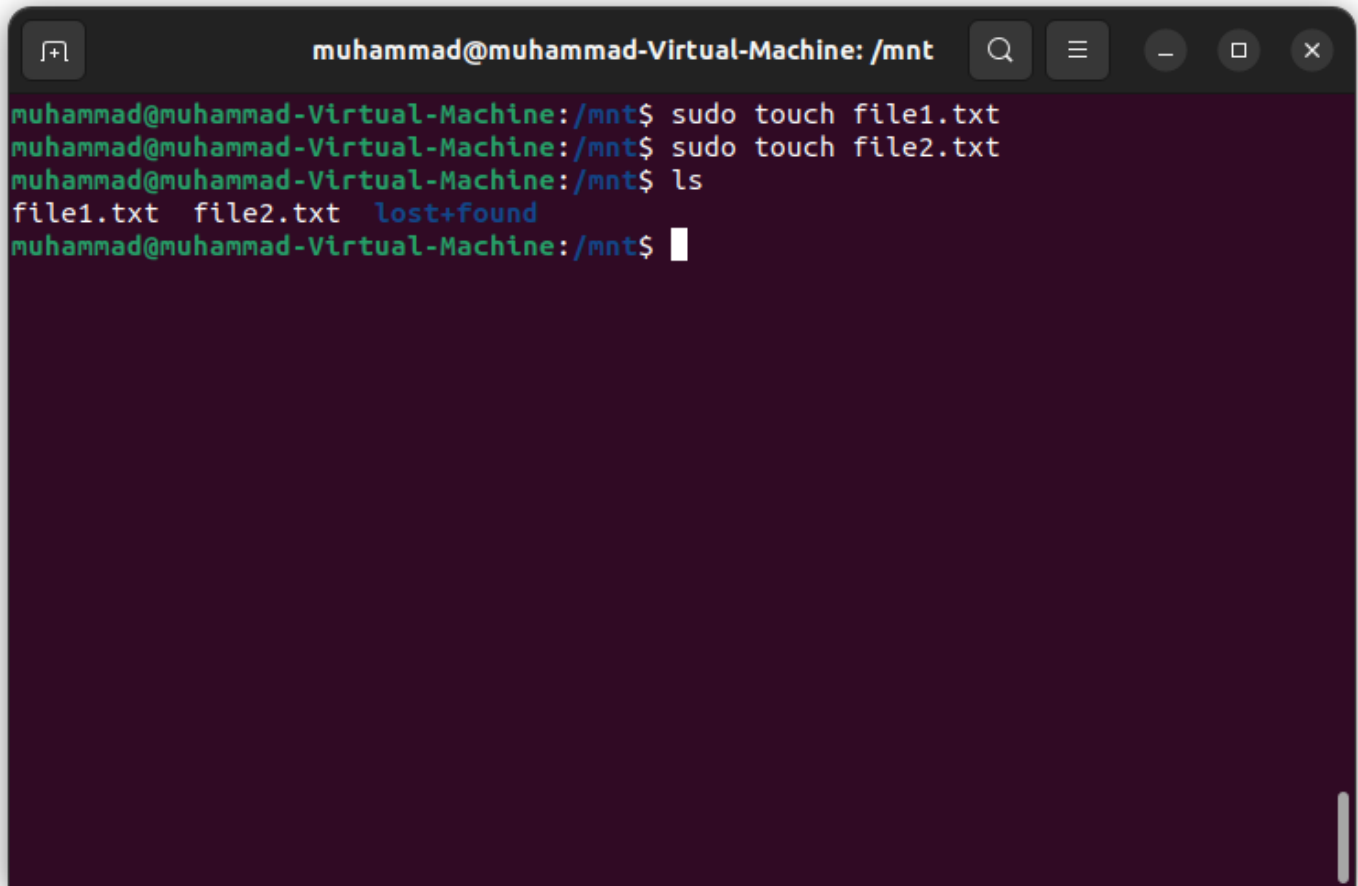
```
muhammad@muhammad-Virtual-Machine: ~  
muhammad@muhammad-Virtual-Machine:~$ sudo mkfs.ext4 /tmp/disk.img  
mke2fs 1.46.5 (30-Dec-2021)  
Found a dos partition table in /tmp/disk.img  
Proceed anyway? (y,N) y  
Discarding device blocks: done  
Creating filesystem with 5000 4k blocks and 5008 inodes  
  
Allocating group tables: done  
Writing inode tables: done  
Creating journal (1024 blocks): done  
Writing superblocks and filesystem accounting information: done  
  
muhammad@muhammad-Virtual-Machine:~$
```

- mount the formatted partition into /mnt directory

A terminal window titled "muhammad@muhammad-Virtual-Machine: ~" with standard window controls. The terminal shows the command "sudo mount /dev/loop8 /mnt" being entered and executed. The prompt returns to the shell.

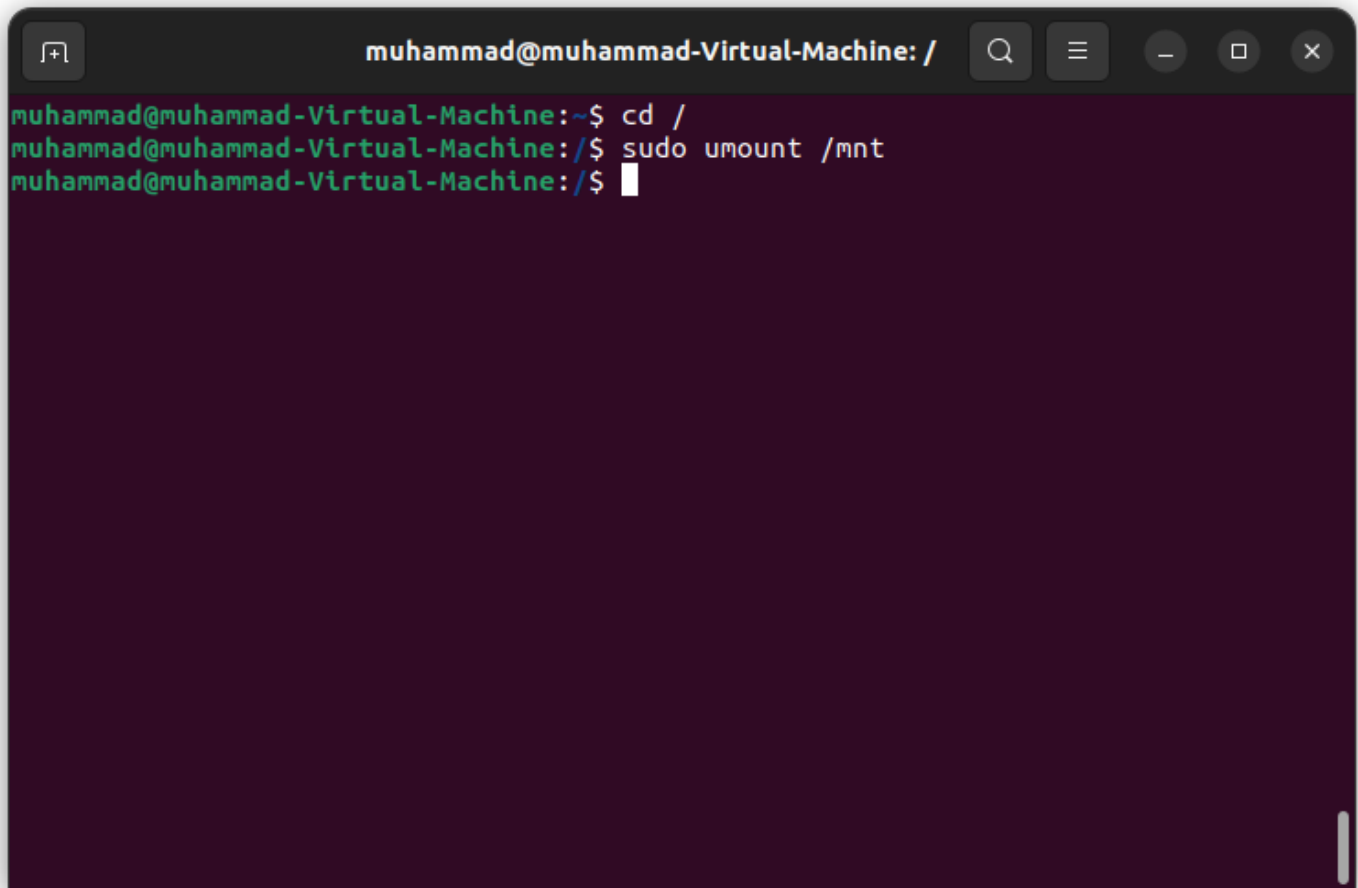
```
muhammad@muhammad-Virtual-Machine: ~$ sudo mount /dev/loop8 /mnt
muhammad@muhammad-Virtual-Machine: ~$
```

- create some files inside the mounted /mnt directory

A terminal window titled "muhammad@muhammad-Virtual-Machine: /mnt" with standard window controls. The terminal shows a sequence of commands: "sudo touch file1.txt", "sudo touch file2.txt", and "ls". The output of "ls" is "file1.txt file2.txt lost+found".

```
muhammad@muhammad-Virtual-Machine: /mnt$ sudo touch file1.txt
muhammad@muhammad-Virtual-Machine: /mnt$ sudo touch file2.txt
muhammad@muhammad-Virtual-Machine: /mnt$ ls
file1.txt  file2.txt  lost+found
muhammad@muhammad-Virtual-Machine: /mnt$
```

- unmount /mnt directory using umount command

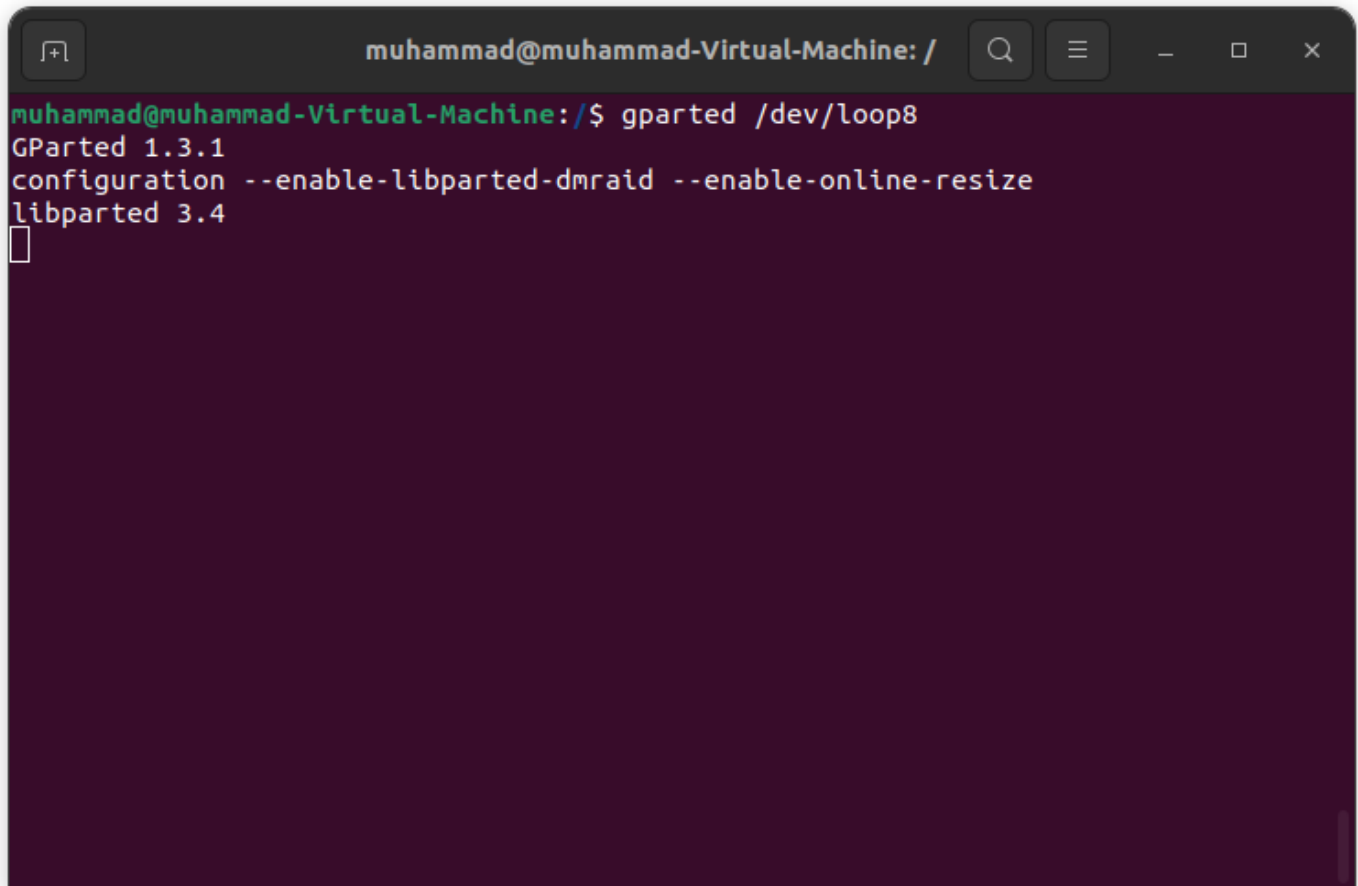
A terminal window titled "muhammad@muhammad-Virtual-Machine: /" with standard window controls. The terminal shows a sequence of commands: "cd /", "sudo umount /mnt", and a blank prompt. The text is green on a dark purple background.

```
muhammad@muhammad-Virtual-Machine:~$ cd /
muhammad@muhammad-Virtual-Machine:/$ sudo umount /mnt
muhammad@muhammad-Virtual-Machine:/$
```

- using `apt` command, search and install `gparted` program

```
muhammad@muhammad-Virtual-Machine: /
muhammad@muhammad-Virtual-Machine:/$ apt-cache search gparted
gparted - GNOME partition editor
gparted-common - GNOME partition editor -- common data
partitionmanager - file, disk and partition management for KDE
muhammad@muhammad-Virtual-Machine:/$ sudo apt-get install gparted
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  dctrl-tools dmeventd dpkg-repack gir1.2-timezonemap-1.0 gir1.2-xkl-1.0
  libaio1 libdebian-installer4 libdevmapper-event1.02.1 libdpkg-perl
  libfile-fcntllock-perl libflashrom1 libftdi1-2 libllvm13 liblvm2cmd2.03
  libqt5designer5 libqt5help5 libqt5positioning5 libqt5sensors5 libqt5test5
  libqt5webchannel5 libqt5webkit5 libtimezonemap-data libtimezonemap1
  linux-headers-5.15.0-27 linux-headers-5.15.0-27-generic
  linux-image-5.15.0-27-generic linux-modules-5.15.0-27-generic
  linux-modules-extra-5.15.0-27-generic lvm2 python3-dbus.mainloop.pyqt5
  python3-icu python3-pam python3-pyqt5 python3-pyqt5.qtsvg
  python3-pyqt5.qtwebkit python3-pyqt5.sip rdate thin-provisioning-tools
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  gparted-common
Suggested packages:
  gpart jfsutils mtools reiser4progs reiserfsprogs udftools xfsprogs
```


- navigate and use gparted to detect the the new partition.

A terminal window with a dark background and light text. The title bar at the top reads "muhammad@muhammad-Virtual-Machine: /". The terminal content shows the command "gparted /dev/loop8" being executed, followed by the output "GParted 1.3.1", "configuration --enable-libparted-dmraid --enable-online-resize", and "libparted 3.4". A cursor is visible on the line following the output.

```
muhammad@muhammad-Virtual-Machine: /  
muhammad@muhammad-Virtual-Machine:/$ gparted /dev/loop8  
GParted 1.3.1  
configuration --enable-libparted-dmraid --enable-online-resize  
libparted 3.4  
█
```

