

1. Using dd command create empty file with size 20MB (hint: count 4000, bs=512)

```
ubuntu@ubuntu:~$ dd if=/dev/zero of=empty_file bs=512 count=4000
4000+0 records in
4000+0 records out
2048000 bytes (2.0 MB, 2.0 MiB) copied, 0.0621606 s, 32.9 MB/s
ubuntu@ubuntu:~$ ls
Desktop    Downloads  Pictures   Templates  empty_file
Documents  Music      Public     Videos     snap
ubuntu@ubuntu:~$
```

2. Attach the file as loop device using losetup command (hint: user losetup -f to allocate free device)

```
ubuntu@ubuntu:~$ sudo losetup -f
/dev/loop9
ubuntu@ubuntu:~$ sudo losetup -f /dev/loop9 empty_file
losetup: unexpected arguments
ubuntu@ubuntu:~$ sudo losetup /dev/loop9 empty_file
```

3. Using fdisk command, create new partition into the loop device(`fdisk /dev/loop<??>` Where <??> is the device number)

```
ubuntu@ubuntu:~$ sudo fdisk /dev/loop9

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 0xa899435f.

Command (m for help): n
Partition type
  10 GB Volume y (0 primary, 0 extended, 4 free)
  e extended (container for logical partitions)
Select (default p): p
Partition number (1-4, default 1): 1
First sector (1-3999, default 1): 1
Last sector, +/-sectors or +/-size{K,M,G,T,P} (1-3999, default 3999): 3999

Created a new partition 1 of type 'Linux' and of size 2 MiB.

Command (m for help):
```

4. Format the new partition using mkfs.ext4 command

```
ubuntu@ubuntu:~$ sudo mkfs.ext4 empty_file
mke2fs 1.46.5 (30-Dec-2021)

Filesystem too small for a journal
Discarding device blocks: done
Creating filesystem with 500 4k blocks and 256 inodes

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done
```

5. Mount the formatted partition into /mnt directory

```
ubuntu@ubuntu:~$ sudo mount /dev/loop9 /mnt
ubuntu@ubuntu:~$ ls /mnt
lost+found
ubuntu@ubuntu:~$
```

6. Create some files inside the mounted /mnt directory

```
ubuntu@ubuntu:~$ sudo touch /mnt/empty2.txt
ubuntu@ubuntu:~$ sudo touch /mnt/empty3.txt
ubuntu@ubuntu:~$ ls /mnt
empty2.txt empty3.txt lost+found
ubuntu@ubuntu:~$
```

7. Unmount /mnt directory using unmount command

```
~$ Sudo umount /mnt
```

8. Using `apt` command, search and install `gparted` program

```
ubuntu@ubuntu:~$ sudo apt install gparted
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
gparted is already the newest version (1.3.1-1ubuntu1).
0 upgraded, 0 newly installed, 0 to remove and 417 not upgraded.
ubuntu@ubuntu:~$
```

9. Navigate and use gparted to detect the new partition

~\$ gparted /dev/loop9

