

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

```
nehad@nehad-VirtualBox:~$ 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, 0.611684 s, 33.5 MB/s
```

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

```
nehad@nehad-VirtualBox:~$ sudo losetup -f
/dev/loop15
nehad@nehad-VirtualBox:~$ sudo losetup /dev/loop15 /tmp/disk.img
```

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

```
nehad@nehad-VirtualBox:~$ sudo fdisk /dev/loop15

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 0x2d33ccbe.

Command (m for help): m

Help:

DOS (MBR)
a toggle a bootable flag
b edit nested BSD disklabel
c toggle the dos compatibility flag

Generic
d delete a partition
F list free unpartitioned space
l list known partition types
n add a new partition
p print the partition table
t change a partition type
v verify the partition table
i print information about a partition
```

```

x  extra functionality (experts only)

Script
I  load disk layout from sfdisk script file
O  dump disk layout to sfdisk script file

Save & Exit
w  write table to disk and exit
q  quit without saving changes

Create a new label
g  create a new empty GPT partition table
G  create a new empty SGI (IRIX) partition table
o  create a new empty DOS partition table
s  create a new empty Sun partition table

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): 1
First sector (2048-39999, default 2048): 2048
Last sector, +/-sectors or +/-size[K,M,G,T,P] (2048-39999, default 39999): +5

Created a new partition 1 of type 'Linux' and of size 3 KiB.

```

4-format the new partition using mkfs.ext4 command

```

nehad@nehad-VirtualBox:~$ sudo mkfs.ext4 /tmp/disk.img
mke2fs 1.46.5 (30-Dec-2021)
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

```

5-mount the formatted partition into /mnt directory

```

nehad@nehad-VirtualBox:~$ ls /mnt
lost+found

```

6-create some files inside the mounted /mnt directory

```

nehad@nehad-VirtualBox:~$ sudo touch file1 file2
nehad@nehad-VirtualBox:~$ ls
Desktop      file2          list_output_number.txt  Pictures      Videos
Documents    file2.txt      list-output.txt         Public
Downloads    index.html     Music                   snap
file1        iti-0          my-website              task1
file1.txt    iti-1          os_team_workspace       Templates

```

7-unmount /mnt directory using umount command

```

nehad@nehad-VirtualBox:~$ sudo umount /mnt

```

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

```

nehad@nehad-VirtualBox:~$ sudo apt 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:
 chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver
 intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58
 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1
 libcodec2-1.0 libdavid5 libflite1 libgme0 libgsm1
 libgstreamer-plugins-bad1.0-0 libigdgmm12 liblilv-0-0 libllvm15 libmfx1
 libmysofa1 libnorm1 libopenmpt0 libpgm-5.3-0 libpostproc55 librabbitmq4
 librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0
 libsrt1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0
 libva-drm2 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1
 libx265-199 libxvidcore4 libzimg2 libzmq5 libzvbi-common libzvbi0
 mesa-va-drivers mesa-va-drivers pocketsphinx-en-us systemd-hwe-hwdb
 va-driver-all vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
 gparted-common
Suggested packages:
 dmraid gpart jfsutils kpartx mtools reiser4progs reiserfsprogs udftools
 xfsprogs exfatprogs
The following NEW packages will be installed:
 gparted gparted-common

```

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

```

nehad@nehad-VirtualBox:~$ sudo gparted /dev/loop15
GParted 1.3.1
configuration --enable-libparted-dmraid --enable-online-resize
libparted 3.4

```

/dev/loop15 - GParted

GParted


Edit


View


Device


Partition


Help


















 /dev/loop15 (19.53 MiB) ▾

/dev/loop15
19.53 MiB

| Partition | File System | Size | Used | Unused | Flags |
|-------------|------------------|-----------|----------|-----------|-------|
| /dev/loop15 | <div></div> ext4 | 19.53 MiB | 5.30 MiB | 14.23 MiB | |

/dev/loop15 (19.53 MiB) ▾

/dev/loop15
19.53 MiB

| Partition | File System | Size | Used | Unused | Flags |
|-------------|------------------|-----------|----------|-----------|-------|
| /dev/loop15 | <div></div> ext4 | 19.53 MiB | 5.30 MiB | 14.23 MiB | |