LAB 5

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

```
nada@Ubuntu:~$ 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, 1.04788 s, 19.5 MB/s
```

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

```
nada@Ubuntu:~$ sudo losetup -f
[sudo] password for nada:
/dev/loop1
```

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

```
nada@Ubuntu:~$ sudo fdisk /dev/loop1

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 0x53aad6e1.

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.
```

- format the new partition using `mkfs.ext4` command

```
nada@Ubuntu:~$ 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
```

- mount the formatted partition into /mnt directory

```
nada@Ubuntu:~$ sudo mount /dev/loop1 /mnt
nada@Ubuntu:~$ ls /mnt
lost+found
```

- create some files inside the mounted /mnt directory

```
nada@Ubuntu:~$ sudo touch /mnt/file1.txt
nada@Ubuntu:~$ sudo touch /mnt/file2.txt
nada@Ubuntu:~$ sudo touch /mnt/file3.txt
nada@Ubuntu:~$ ls /mnt
file1.txt  file2.txt  file3.txt  lost+found
```

- unmount `/mnt` directory using `umount` command

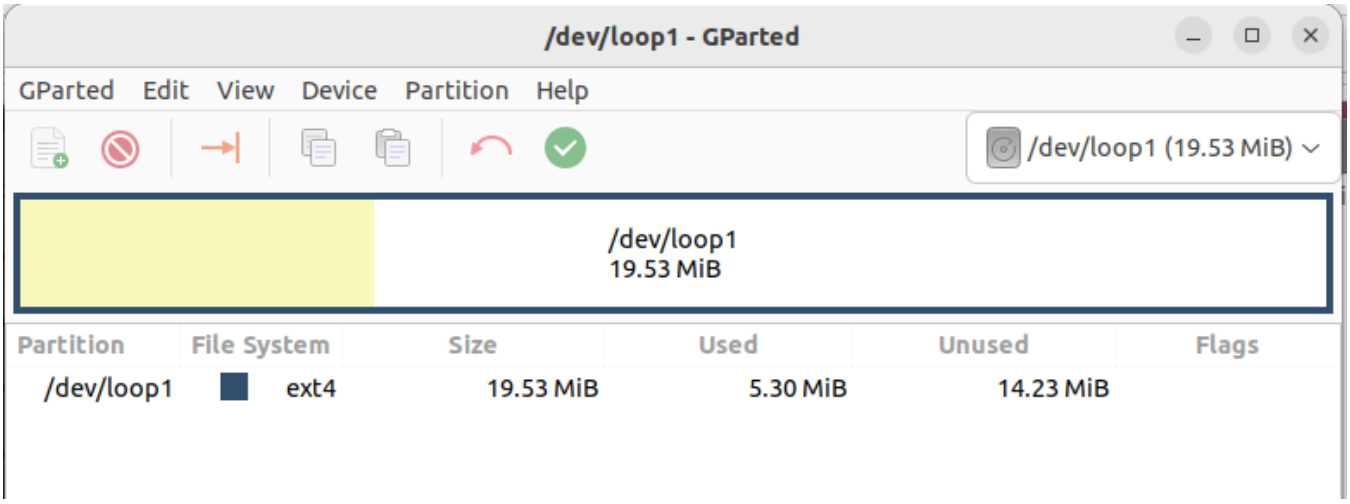
```
nada@Ubuntu:~$ sudo umount /mnt
```

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

```
nada@Ubuntu:~$ 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:
  libreoffice-ogltrans systemd-hwe-hwdb
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
0 upgraded, 2 newly installed, 0 to remove and 240 not upgraded.
Need to get 490 kB of archives.
After this operation, 2,128 kB of additional disk space will be used.
```

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

```
nada@Ubuntu:~$ gparted /dev/loop1
GParted 1.3.1
configuration --enable-libparted-dmraid --enable-online-resize
libparted 3.4
```


/dev/loop1 - GParted
GParted
Edit
View
Device
Partition
Help
/dev/loop1 (19.53 MiB)
/dev/loop1
19.53 MiB
Partition
File System
Size
Used
Unused
Flags
/dev/loop1
ext4
19.53 MiB
5.30 MiB
14.23 MiB