LAB5

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

```
tahoun@tahoun-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, 0.145282 s, 141 MB/s
```

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

losetup -f
sudo losetup -P /dev/loop18 /tmp/disk.img

```
tahoun@tahoun-VirtualBox:~$ sudo losetup -f
[sudo] password for tahoun:
/dev/loop19
```

```
tahoun@tahoun-VirtualBox:~$ sudo losetup -P /dev/loop19 /tmp/disk.img
```

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

```
tahoun@tahoun-VirtualBox:~$ sudo fdisk /dev/loop19

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 0x7c633b71.

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):
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): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

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

```
tahoun@tahoun-VirtualBox:~$ 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
```

5- mount the formatted partition into /mnt directory

```
Command (m for help): sudo mount /dev/loop18p1 /mnt
Created a new partition 1 of type 'Linux native' and of size 7.8 MiB.
Created a new partition 2 of type 'Linux swap' and of size 7.8 MiB.
Created a new partition 3 of type 'Whole disk' and of size 15.7 MiB.
Created a new Sun disklabel.
```

6- create some files inside the mounted /mnt director

```
tahoun@tahoun-VirtualBox:~$ sudo mount /dev/loop19 /mnt
tahoun@tahoun-VirtualBox:~$ ls /mnt
lost+found
tahoun@tahoun-VirtualBox:~$ cd /mnt
tahoun@tahoun-VirtualBox:/mnt$ sudo touch file1.txt
tahoun@tahoun-VirtualBox:/mnt$ ls
file1.txt  lost+found
tahoun@tahoun-VirtualBox:/mnt$
```

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

```
tahoun@tahoun-VirtualBox:~$ sudo umount /mnt
tahoun@tahoun-VirtualBox:~$ ls /mnt
file1.txt
```

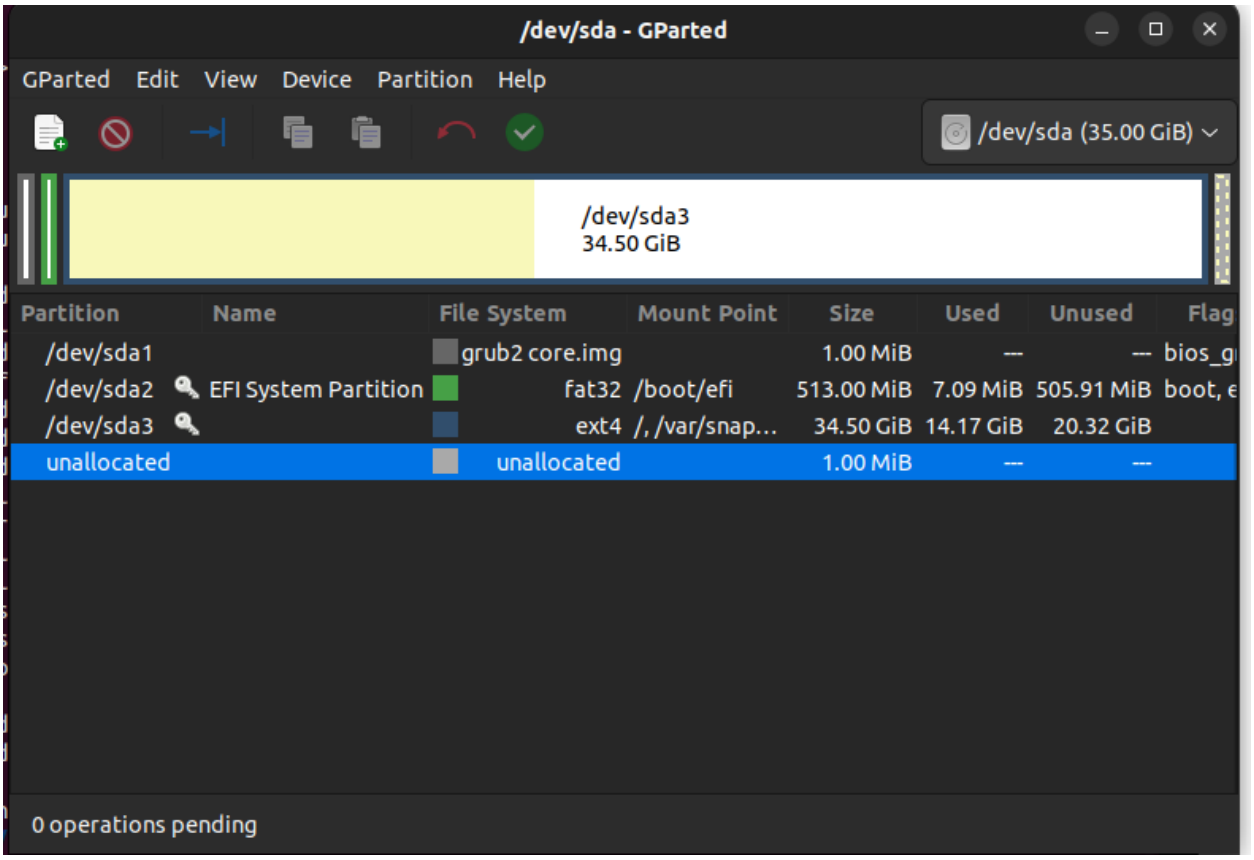
8- using `apt` command, search and install `gparted` program

```
tahoun@tahoun-VirtualBox:~$ sudo apt search gparted
Sorting... Done
Full Text Search... Done
gparted/jammy 1.3.1-1ubuntu1 amd64
  GNOME partition editor

gparted-common/jammy,jammy 1.3.1-1ubuntu1 all
  GNOME partition editor -- common data

partitionmanager/jammy 21.12.3-0ubuntu1 amd64
  file, disk and partition management for KDE
```

```
tahoun@tahoun-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:
  libflashrom1 libftdi1-2 libllvm13
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 77 not upgraded.
Need to get 490 kB of archives.
After this operation, 2,128 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 gparted-common all 1.3.1-1ubuntu1 [71.9 kB]
Get:2 http://eg.archive.ubuntu.com/ubuntu jammy/main amd64 gparted amd64 1.3.1-1ubuntu1 [418 kB]
Fetched 490 kB in 1s (345 kB/s)
Selecting previously unselected package gparted-common.
(Reading database ... 204274 files and directories currently installed.)
Preparing to unpack .../gparted-common_1.3.1-1ubuntu1_all.deb ...
Unpacking gparted-common (1.3.1-1ubuntu1) ...
Selecting previously unselected package gparted.
Preparing to unpack .../gparted_1.3.1-1ubuntu1_amd64.deb ...
Unpacking gparted (1.3.1-1ubuntu1) ...
Setting up gparted-common (1.3.1-1ubuntu1) ...
Setting up gparted (1.3.1-1ubuntu1) ...
Processing triggers for mailcap (3.70+nmu1ubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
Processing triggers for hicolor-icon-theme (0.17-2) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
tahoun@tahoun-VirtualBox:~$
```

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

```
tahoun@tahoun-VirtualBox:~$ sudo gparted
GParted 1.3.1
configuration --enable-libparted-dmraid --enable-online-resize
libparted 3.4
```



```
tahoun@tahoun-VirtualBox:~$ sudo gparted /dev/loop19
GParted 1.3.1
configuration --enable-libparted-dmraid --enable-online-resize
libparted 3.4
```