

## Lab 5

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

```
habiba@habiba-VirtualBox: ~  
habiba@habiba-VirtualBox:~$ dd if=/dev/zero of=/tmp/disk.img bs=512 count=4000  
4000+0 records in  
4000+0 records out  
2048000 bytes (2.0 MB, 2.0 MiB) copied, 0.0456455 s, 44.9 MB/s
```

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

```
habiba@habiba-VirtualBox:~$ losetup -f  
/dev/loop14  
habiba@habiba-VirtualBox:~$ losetup -p /dev/loop14 /tmp/disk.img  
losetup: invalid option -- 'p'  
Try 'losetup --help' for more information.  
habiba@habiba-VirtualBox:~$ losetup -P /dev/loop14 /tmp/disk.img  
losetup: /dev/loop14: failed to set up loop device: Permission denied  
habiba@habiba-VirtualBox:~$ sudo losetup /dev/loop14 /tmp/disk.img  
[sudo] password for habiba:
```

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

```
[sudo] password for habiba:  
habiba@habiba-VirtualBox:~$ sudo fdisk /dev/loop14  
  
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 0x293ad932.  
  
Command (m for help): m  
  
Help:  
  
DOS (MBR)  
a toggle a bootable flag  
b edit nested BSD disklabel  
c toggle the dos compatibility flag
```

```

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 (1-3999, default 1): 2
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2-3999, default 3999):

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

Command (m for help): p
Disk /dev/loop14: 1.95 MiB, 2048000 bytes, 4000 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0x293ad932

Device            Boot Start    End Sectors  Size Id Type
/dev/loop14p1      2      3999    3998     2M 83 Linux

Command (m for help):
All unwritten changes will be lost. do you really want to quit? y

```

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

```

habiba@habiba-VirtualBox:~$ sudo mkfs.ext4 /tmp/disk.img
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

```

- mount the formatted partition into `/mnt` directory

```

habiba@habiba-VirtualBox:~$ sudo mount /dev/loop14 /mnt
habiba@habiba-VirtualBox:~$ ls /mnt
lost+found

```

- create some files inside the mounted `/mnt` directory

```

habiba@habiba-VirtualBox:~$ sudo touch /mnt/file1.txt
habiba@habiba-VirtualBox:~$ sudo touch /mnt/file2.txt
habiba@habiba-VirtualBox:~$ sudo touch /mnt/file3.txt
habiba@habiba-VirtualBox:~$ ls /mnt
file1.txt file2.txt file3.txt lost+found
habiba@habiba-VirtualBox:~$

```

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

```

file1.txt file2.txt file3.txt lost+found
habiba@habiba-VirtualBox:~$ sudo umount /mnt
habiba@habiba-VirtualBox:~$

```

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

```
habiba@habiba-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

habiba@habiba-VirtualBox:~$ sudo apt install gparted
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  systemd-hwe-hwdb
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  gparted-common
Suggested packages:
  dmraid gpart jfsutils kpartx mtools reiser4progs reiserfsprogs udftools
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 2s (201 kB/s)
Selecting previously unselected package gparted-common.
(Reading database ... 199321 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) ...
```

navigate and use gparted to detect the the new partition.

