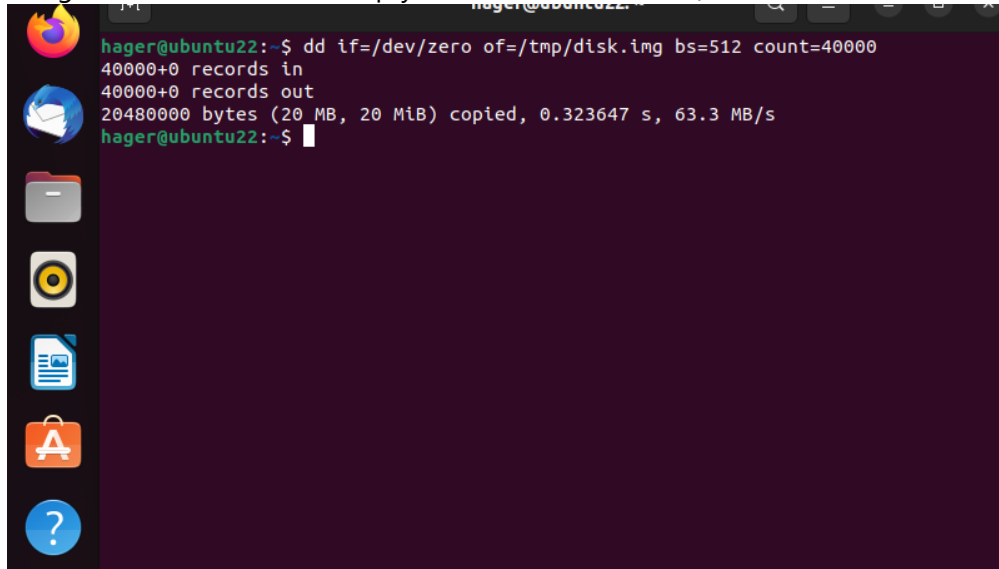


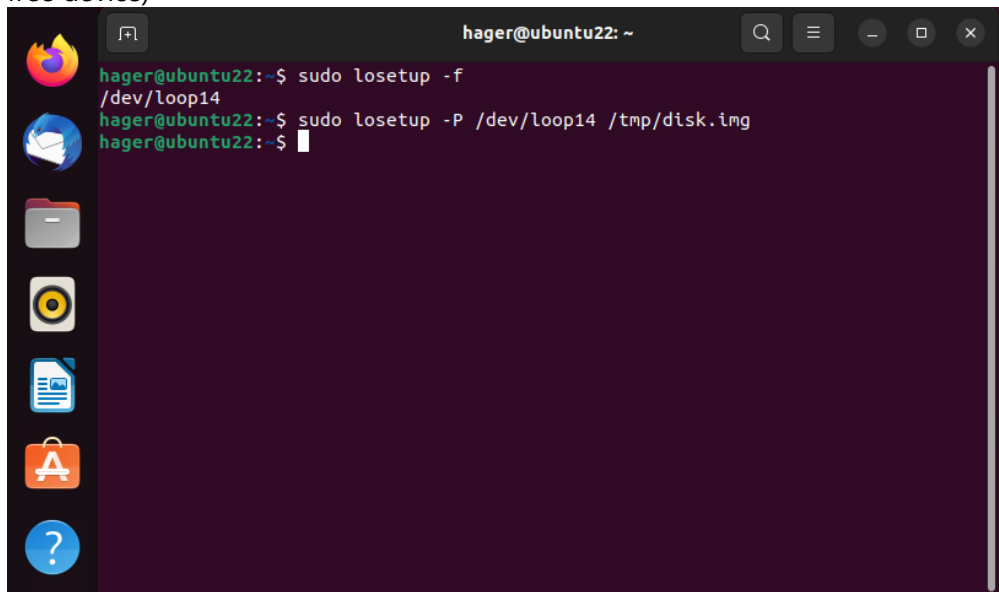
Lab 5

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



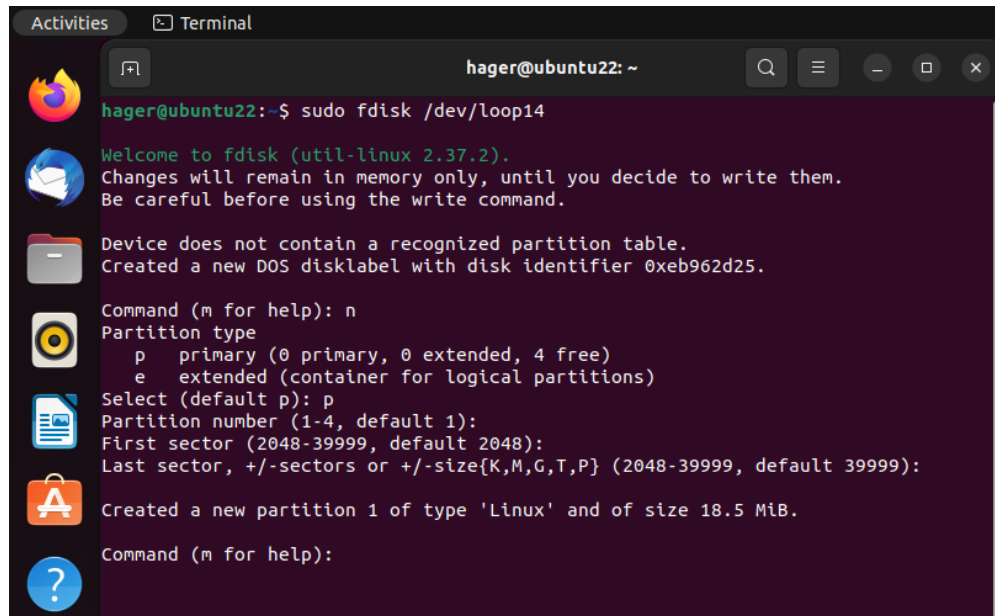
```
hager@ubuntu22:~$ dd if=/dev/zero of=/tmp/disk.img bs=512 count=40000
40000+0 records in
40000+0 records out
20480000 bytes (20 MB, 20 MiB) copied, 0.323647 s, 63.3 MB/s
hager@ubuntu22:~$
```

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



```
hager@ubuntu22:~$ sudo losetup -f
/dev/loop14
hager@ubuntu22:~$ sudo losetup -P /dev/loop14 /tmp/disk.img
hager@ubuntu22:~$
```

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

A terminal window titled 'Terminal' with the user 'hager@ubuntu22: ~'. The command 'sudo fdisk /dev/loop14' has been executed. The output shows the fdisk utility's welcome message, confirmation that the device is empty, and the creation of a new DOS disklabel. It then prompts for a partition type, where 'p' (primary) is selected. The partition number is set to 1, and the first and last sectors are confirmed. Finally, it reports the creation of a new partition of type 'Linux' with a size of 18.5 MiB.

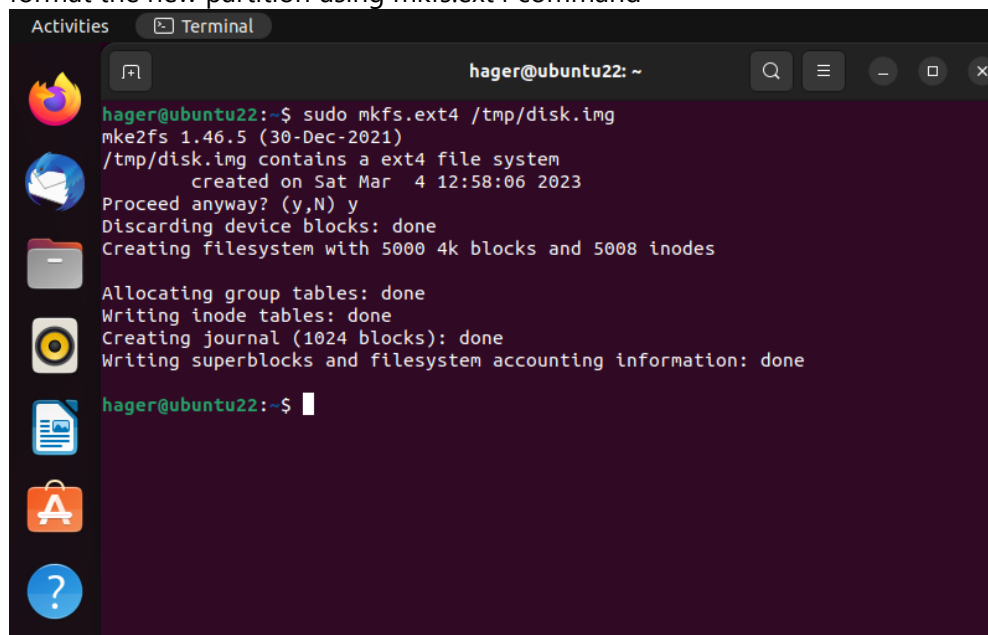
```
hager@ubuntu22:~$ sudo fdisk /dev/loop14
Welcome to fdisk (util-linux 2.37.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0xeb962d25.

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.

Command (m for help):
```

- format the new partition using mkfs.ext4 command

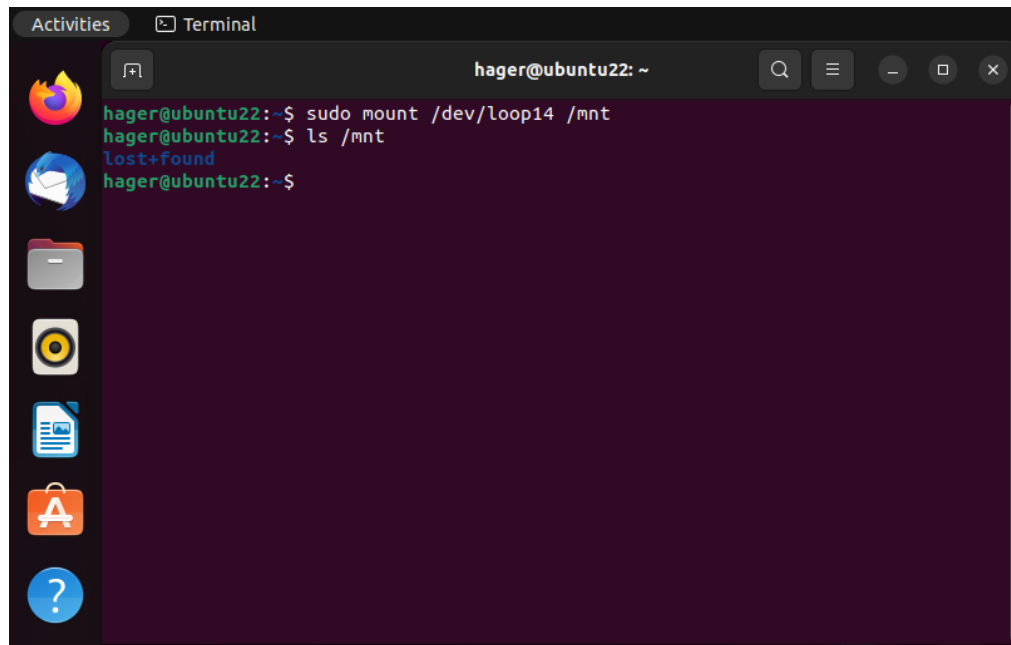
A terminal window titled 'Terminal' with the user 'hager@ubuntu22: ~'. The command 'sudo mkfs.ext4 /tmp/disk.img' has been executed. The output shows the mkfs utility's version and date, confirmation that the file contains an ext4 file system, and the creation date. It then prompts to proceed, where 'y' is entered. The process of discarding device blocks, creating the filesystem with 5000 4k blocks and 5008 inodes, allocating group tables, writing inode tables, creating a journal, and writing superblocks and filesystem accounting information is shown. The terminal ends with the prompt 'hager@ubuntu22:~\$' and a cursor.

```
hager@ubuntu22:~$ sudo mkfs.ext4 /tmp/disk.img
mke2fs 1.46.5 (30-Dec-2021)
/tmp/disk.img contains a ext4 file system
   created on Sat Mar  4 12:58:06 2023
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

hager@ubuntu22:~$
```

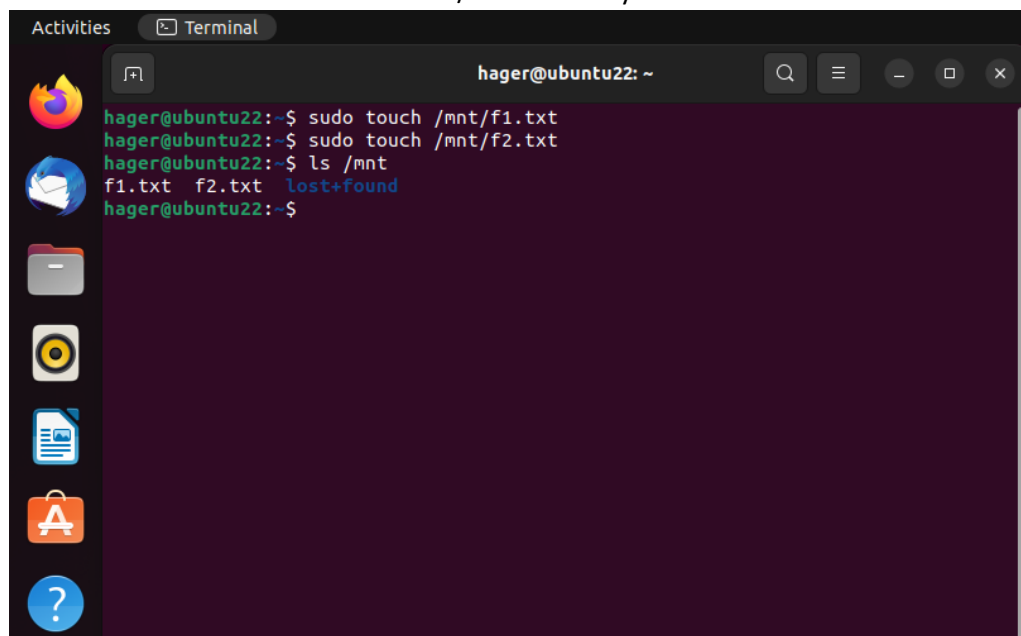
- mount the formatted partition into /mnt directory



A terminal window titled "Terminal" with the prompt "hager@ubuntu22: ~". The user enters the command `sudo mount /dev/loop14 /mnt`, followed by `ls /mnt`, which outputs `lost+found`. The terminal has a dark purple background and a sidebar on the left with various application icons.

```
hager@ubuntu22:~$ sudo mount /dev/loop14 /mnt
hager@ubuntu22:~$ ls /mnt
lost+found
hager@ubuntu22:~$
```

- create some files inside the mounted /mnt directory



A terminal window titled "Terminal" with the prompt "hager@ubuntu22: ~". The user enters the commands `sudo touch /mnt/f1.txt` and `sudo touch /mnt/f2.txt`, followed by `ls /mnt`, which outputs `f1.txt f2.txt lost+found`. The terminal has a dark purple background and a sidebar on the left with various application icons.

```
hager@ubuntu22:~$ sudo touch /mnt/f1.txt
hager@ubuntu22:~$ sudo touch /mnt/f2.txt
hager@ubuntu22:~$ ls /mnt
f1.txt f2.txt lost+found
hager@ubuntu22:~$
```

- unmount /mnt directory using umount command

```
hager@ubuntu22: ~  
hager@ubuntu22:~$ sudo touch /mnt/f1.txt  
hager@ubuntu22:~$ sudo touch /mnt/f2.txt  
hager@ubuntu22:~$ ls /mnt  
f1.txt f2.txt lost+found  
hager@ubuntu22:~$ sudo umount /mnt  
hager@ubuntu22:~$ 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  
xfsprogs exfatprogs  
The following NEW packages will be installed:  
gparted gparted-common  
0 upgraded, 2 newly installed, 0 to remove and 172 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://us.archive.ubuntu.com/ubuntu jammy/main amd64 gparted-common all 1.
```

- using `apt` command, search and install `gparted` program
- navigate and use gparted to detect the the new partition

Activities GParted

```
hager@ubuntu22: ~  
hager@ubuntu22:~$ sudo gparted /dev/loop14  
GParted 1.3.1  
configuration --enable-libparted-dmraid --enable-online-resize  
libparted 3.4
```

/dev/loop14 - GParted

GParted Edit View Device Partition Help

/dev/loop14 (19.53 MiB)

Partition	File System	Size	Used	Unused	Flags
/dev/loop14	ext4	19.53 MiB	5.30 MiB	14.23 MiB	

0 operations pending