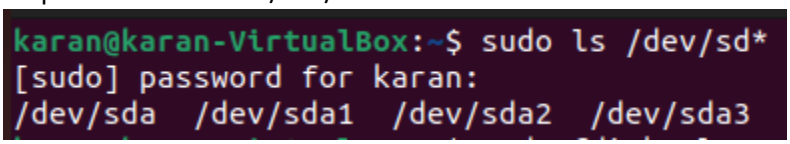
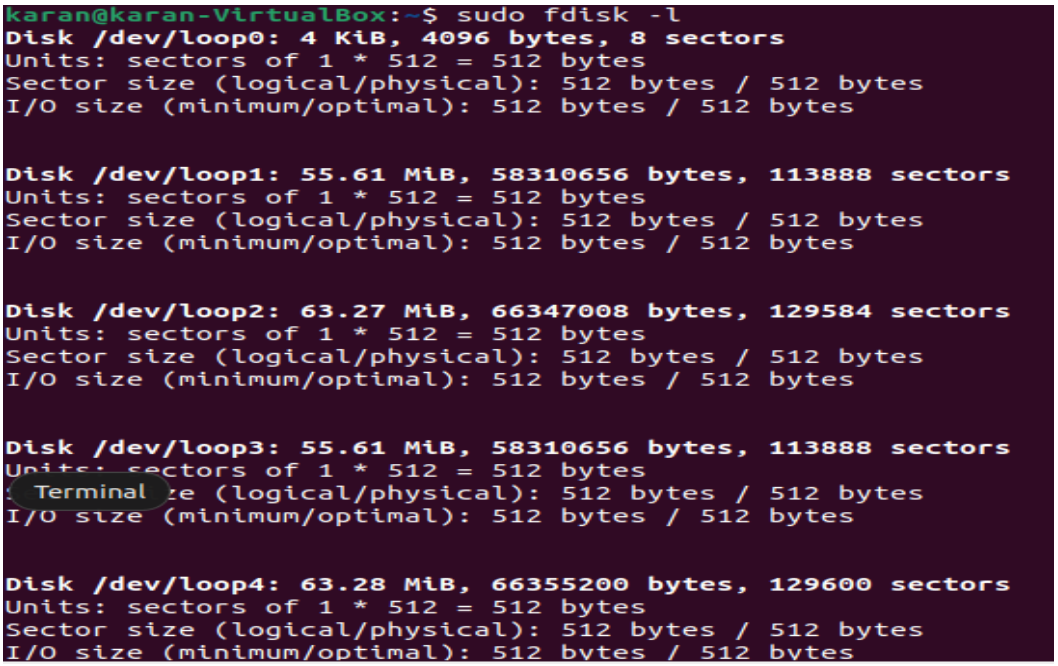
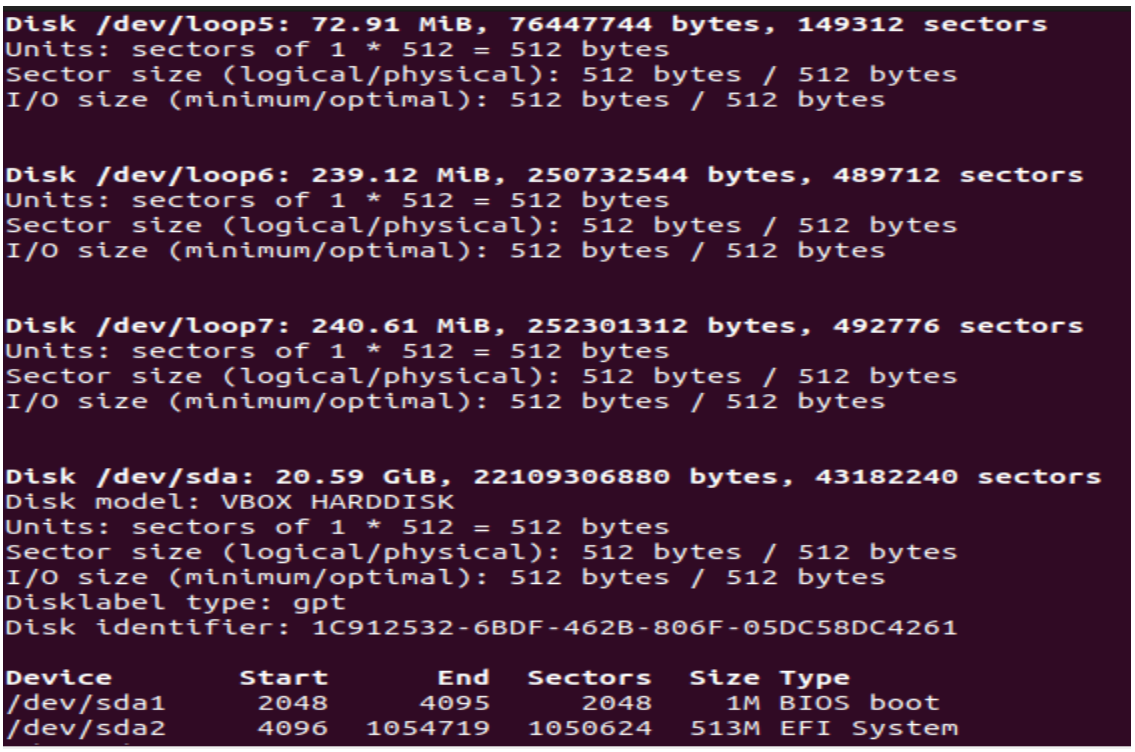
Step 1. Execute the ls  /dev/sd* command to see the current hard disk devices. [use  sudo ]




Step 2. Execute the fdisk -l command to list the current hard disk partitions. [use  sudo ]



```
/dev/sda3  1054720 43182079 42127360 20.1G Linux filesystem


Disk /dev/loop8: 346.33 MiB, 363151360 bytes, 709280 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


Disk /dev/loop9: 91.69 MiB, 96141312 bytes, 187776 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


Disk /dev/loop10: 452.4 MiB, 474374144 bytes, 926512 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


Disk /dev/loop11: 45.93 MiB, 48156672 bytes, 94056 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


Disk /dev/loop12: 45.93 MiB, 48160768 bytes, 94064 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


Disk /dev/loop13: 304 KiB, 311296 bytes, 608 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


Disk /dev/loop14: 49.83 MiB, 52248576 bytes, 102048 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


Disk /dev/loop15: 49.84 MiB, 52260864 bytes, 102072 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


Disk /dev/loop16: 428 KiB, 438272 bytes, 856 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
```

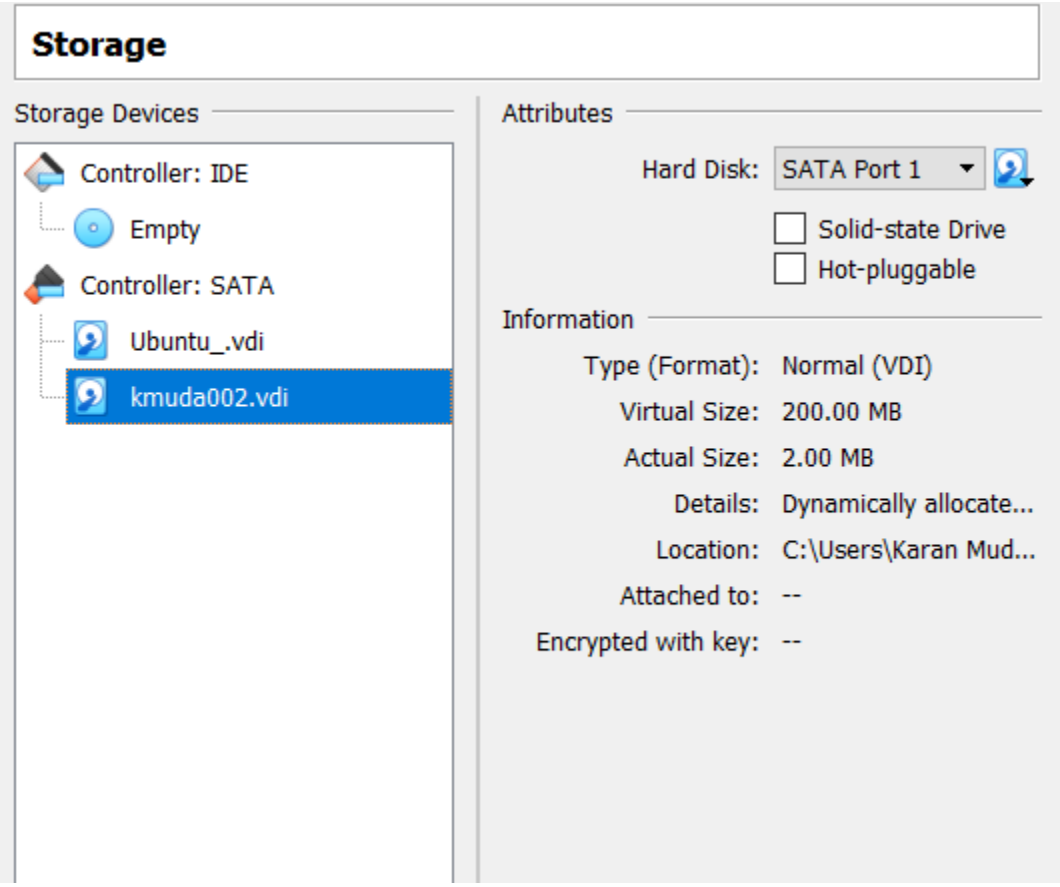
```
Disk /dev/loop17: 76.54 MiB, 80257024 bytes, 156752 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

Step 3. Execute the parted -l command to list the current hard disk partition table. [use  sudo ]

```
karan@karan-VirtualBox:~$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 22.1GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name                  Flags
 1      1049kB  2097kB  1049kB                                     bios_grub
 2      2097kB  540MB   538MB   fat32        EFI System Partition  boot, esp
 3      540MB   22.1GB  21.6GB  ext4
```

Step 1. In the VM setting, attach a new virtual hard disk with the size of 200 MB to our current Linux VM. Name it as “your_midas.vdi” [ HINT: Please refer to the slides and discussion during the class for week 7]




Step 2. Load this virtual hard disk to your virtual machine.

Step 3. Repeat the steps in Part I and highlight the differences after adding the new virtual hard disk.

```
karan@karan-VirtualBox:~$ ls /dev/sd*
/dev/sda  /dev/sda1  /dev/sda2  /dev/sda3  /dev/sdb
```

```
Device       Start      End  Sectors  Size Type
/dev/sda1     2048     4095     2048    1M BIOS boot
/dev/sda2     4096  1054719  1050624  513M EFI System
/dev/sda3  1054720 43182079 42127360 20.1G Linux filesystem


Disk /dev/sdb: 206.55 MiB, 216578560 bytes, 423005 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

```
karan@karan-VirtualBox:~$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 22.1GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Na
 1      1049kB  2097kB  1049kB
 2      2097kB  540MB   538MB   fat32        EF
 3      540MB   22.1GB  21.6GB  ext4


Error: /dev/sdb: unrecognised disk label
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 217MB
Sector size (logical/physical): 512B/512B
Partition Table: unknown
Disk Flags:
```

Step 1. Use the fdisk command to create a new primary partition on the new virtual hard disk attached in Part II.

```
karan@karan-VirtualBox:~$ sudo fdisk /dev/sdb

Welcome to fdisk (util-linux 2.38).
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 0xa4fd2dd5.

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
```

```
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 (2048-423004, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-423004, default 423004):

Created a new partition 1 of type 'Linux' and of size 205.5 MiB.

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

Step 2. Use the correct command to create an ext4 filesystem on the new partition.

```
karan@karan-VirtualBox:~$ sudo mkfs -t ext4 /dev/sdb1
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 52619 4k blocks and 52640 inodes
Filesystem UUID: 9645f5c4-9e69-4fff-9d4e-c1614c3949b1
Superblock backups stored on blocks:
        32768

Allocating group tables: done
Writing inode tables: done
Creating journal (4096 blocks): done
Writing superblocks and filesystem accounting information: done
```

Step 3. Repeat the steps in Part I and highlight the differences.

```
karan@karan-VirtualBox:~$ ls /dev/sd*
/dev/sda  /dev/sda1  /dev/sda2  /dev/sda3  /dev/sdb  /dev/sdb1
```

```
Disk /dev/sdb: 206.55 MiB, 216578560 bytes, 423005 sectors
Disk model: VBOX HARDDISK
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: 0xa4fd2dd5

Device     Boot Start    End Sectors   Size Id Type
/dev/sdb1        2048 423004  420957 205.5M 83 Linux
```

```
karan@karan-VirtualBox:~$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 22.1GB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name                  Flags
 1      1049kB  2097kB  1049kB                                     bios_grub
 2      2097kB  540MB   538MB   fat32        EFI System Partition  boot, esp
 3      540MB   22.1GB  21.6GB  ext4


Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 217MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End    Size   Type     File system  Flags
 1      1049kB  217MB  216MB  primary  ext4
```

Step 4. Make a new directory named /cyse. And mount the new partition under this directory.

```
karan@karan-VirtualBox:~$ sudo mkdir /cyse
karan@karan-VirtualBox:~$ ls /cyse
karan@karan-VirtualBox:~$ sudo mount /dev/sdb1 /cyse
```

Step 5. Use the df command to check the mounting point of the new partition.

```
karan@karan-VirtualBox:~$ sudo df
Filesystem     1K-blocks     Used Available Use% Mounted on
tmpfs            1121232     1476   1119756   1% /run
/dev/sda3       20556360 12132460   7354332  63% /
tmpfs            5606152        0   5606152   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
/dev/sda2         524252     5368    518884   2% /boot/efi
tmpfs            1121228      104   1121124   1% /run/user/1000
/dev/sdb1         180700       24    165948   1% /cyse
```

Step 6. Create a new file named for YourMIDAS.txt (replace YourMIDAS with your MIDAS ID) in the directory /cyse and put your name in that file.

```
karan@karan-VirtualBox:/cyse$ sudo nano kmuda002.txt
karan@karan-VirtualBox:/cyse$ ls
kmuda002.txt  lost+found
```

Step 7. Unmount /cyse directory.

```
karan@karan-VirtualBox:~$ sudo umount /dev/sdb1
karan@karan-VirtualBox:~$ sudo df
Filesystem     1K-blocks     Used Available Use% Mounted on
tmpfs            1121232     1476   1119756   1% /run
/dev/sda3       20556360 12132472   7354320  63% /
tmpfs            5606152        0   5606152   0% /dev/shm
tmpfs               5120        4      5116   1% /run/lock
/dev/sda2         524252     5368    518884   2% /boot/efi
tmpfs            1121228      104   1121124   1% /run/user/1000
```

Step 8. Check the contents in /cyse directory. What do you find?

**Nothing.**

```
karan@karan-VirtualBox:~$ cd /cyse/
karan@karan-VirtualBox:/cyse$ ls
```