

CYSE 270: Linux System for Cybersecurity**Lab 7 – Manage Local Storage****July 6, 2025****Goal**

The goal of this lab is to familiarize students with the fundamental tasks of managing user and group accounts in Linux. By completing this lab, students will gain practical experience in creating, modifying, and deleting accounts, as well as managing group memberships and permissions, which are essential skills in system administration and cybersecurity.

Submission Instructions

- Complete all tasks on your chosen Ubuntu/Kali VM.
- Take screenshots for each numbered step as evidence of successful command execution.
- Save all your screenshots and results in a single PDF or Word document.
- Ensure that all commands are executed correctly and include detailed explanations for each step taken.

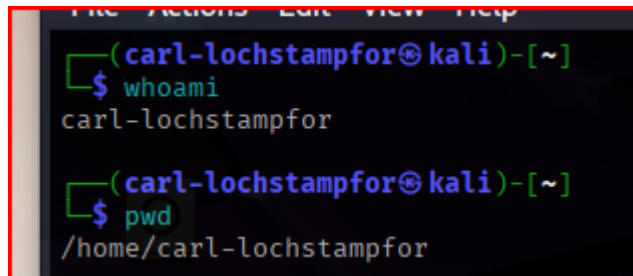
Part I– Check your file system (30 points).

Submit the screenshot for All the three steps.

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

Command >>

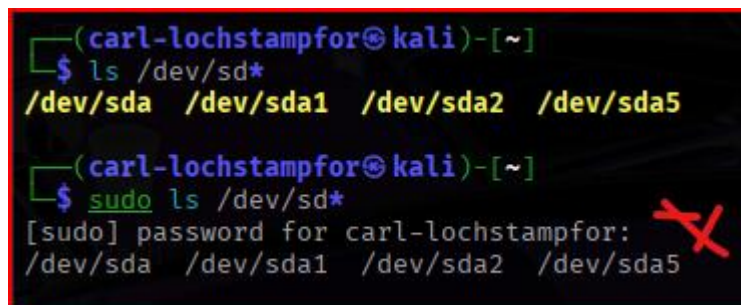
- Verify the current user and directory I am working in.
a. `whoami; pwd`



```
(carl-lochstampfor@kali)-[~]  
$ whoami  
carl-lochstampfor  
  
(carl-lochstampfor@kali)-[~]  
$ pwd  
/home/carl-lochstampfor
```

Command >>

- Show the current hard disk devices
a. `sudo ls /dev/sd*`



```
(carl-lochstampfor@kali)-[~]  
$ ls /dev/sd*  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5  
  
(carl-lochstampfor@kali)-[~]  
$ sudo ls /dev/sd*  
[sudo] password for carl-lochstampfor:  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5
```

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

Command >>

- List the current hard disk partitions
 - sudo fdisk -l**

```
(carl-lochstampfor@kali)-[~]
$ sudo fdisk -l
Disk /dev/sda: 25 GiB, 26843545600 bytes, 52428800 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: 0xa603cfb6

Device      Boot    Start        End    Sectors    Size Id Type
/dev/sda1   *          2048    49641471   49639424   23.7G 83 Linux
/dev/sda2             49643518   52426751   2783234    1.3G  f W95 Ext'd (LBA)
/dev/sda5             49643520   52426751   2783232    1.3G 82 Linux swap / Solaris
```

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

Command >>

- List the current hard disk partition table.
 - sudo parted -l**

```
(carl-lochstampfor@kali)-[~]
$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 26.8GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

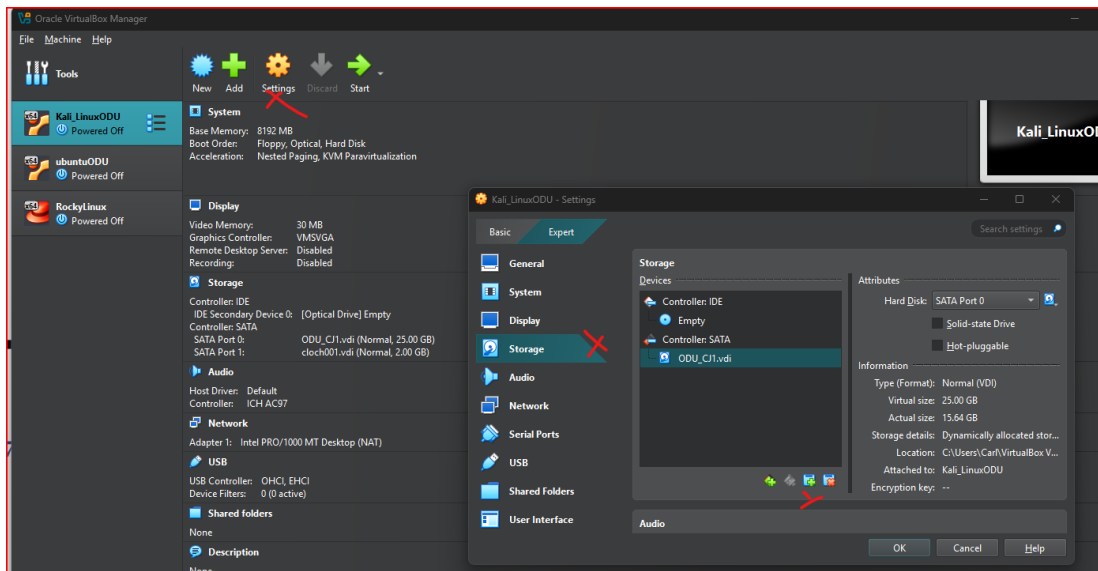
Number  Start   End     Size    Type     File system  Flags
  1      1049kB  25.4GB  25.4GB  primary  ext4         boot
  2      25.4GB  26.8GB  1425MB  extended lba
  5      25.4GB  26.8GB  1425MB  logical  linux-swap(v1) swap
```

Part II– Create a new virtual disk (30 points)

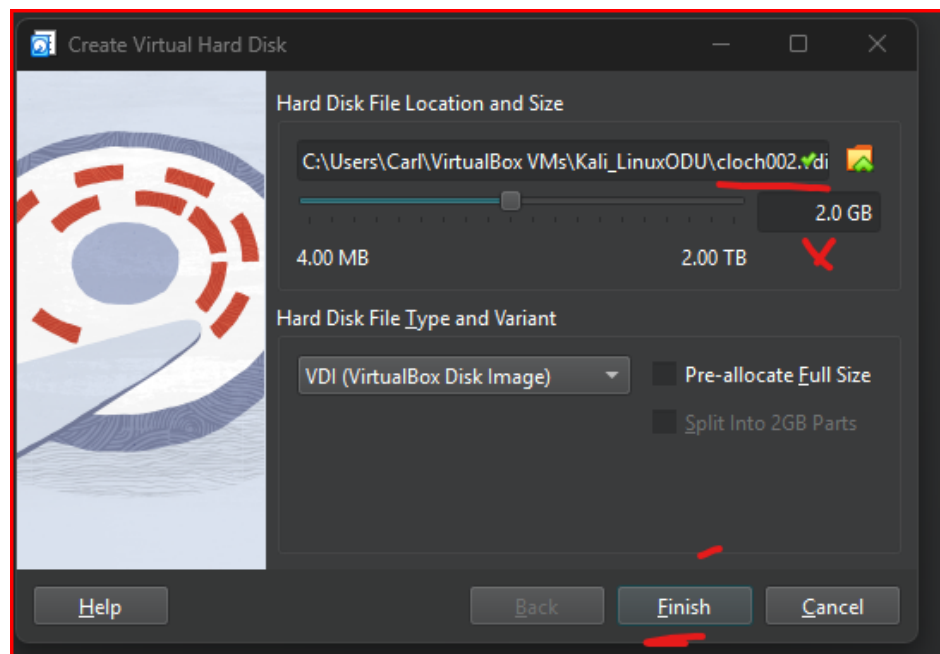
Submit the screenshot for All the three steps.

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]

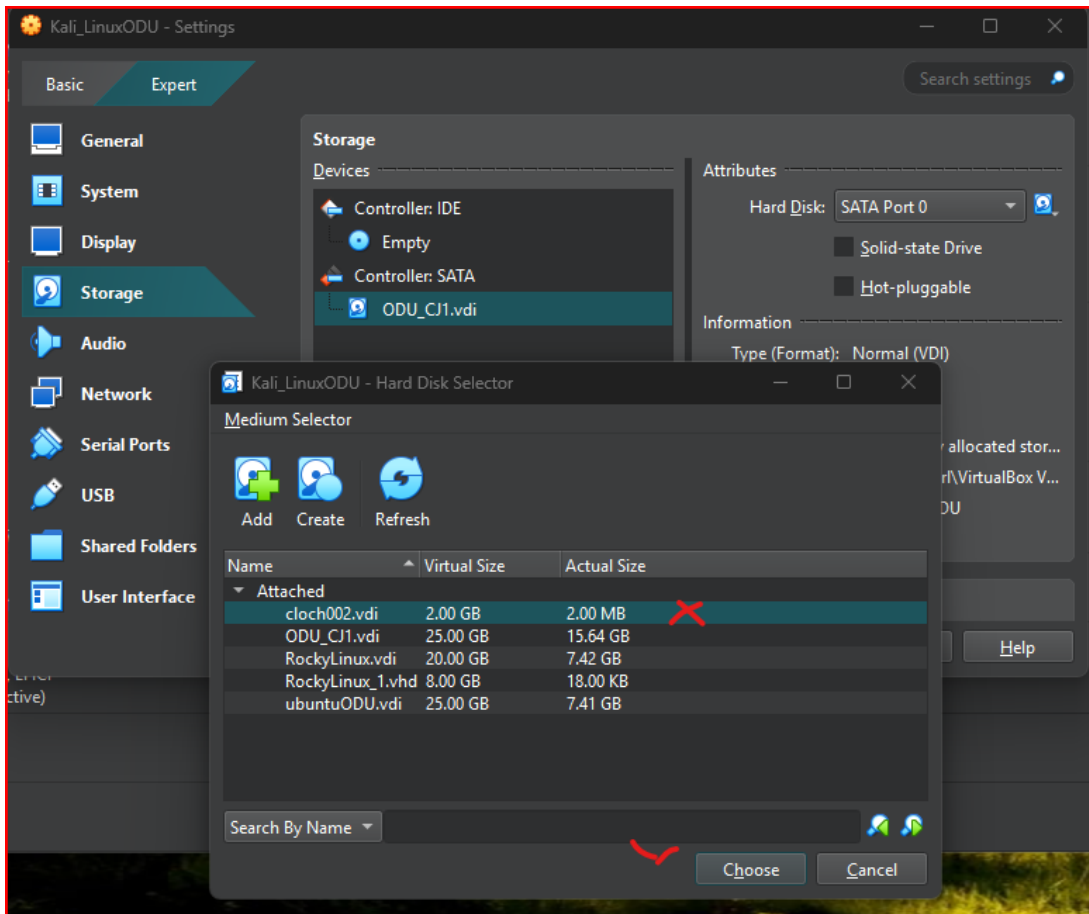
1. In VirtualBox, click the VM/Settings/Storage/Add Attachment/Hard Drive



2. Click Create, choose the amount of storage (i.e., 2 GBs), change the Virtual Hard Disk Name (e.g., cloch002), then click finish. (Typo: 2 should be 1)



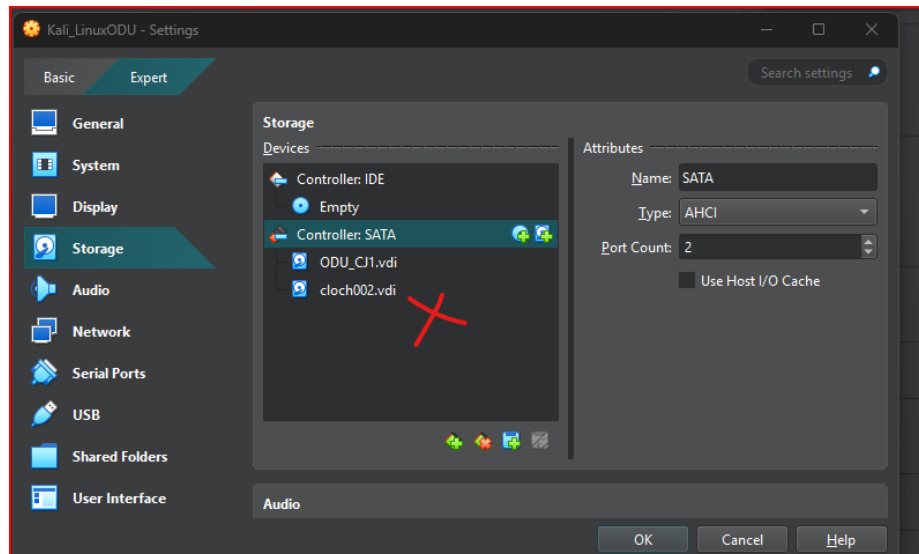
3. Click the newly created Virtual Hard Disk (i.e., **cloch002**), then Choose at the bottom.



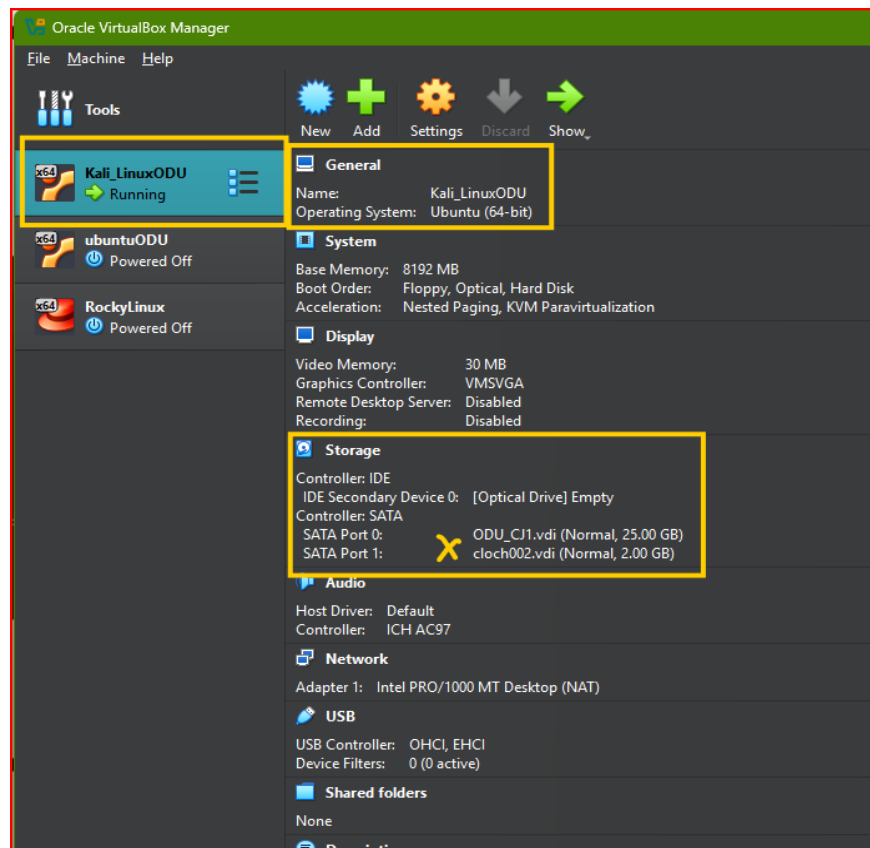
Step 2. Load this virtual hard disk to your virtual machine.

Command >>

1. Verify the VHD was added, then click Okay at the bottom right of the screen.



2. View and Verify the Virtual Hard Disk was loaded to your VM (See 'Storage' section)



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

Command >>

1. List the current hard disk partitions

a. **sudo ls /dev/sd***

```
(carl-lochstampfor@kali)-[~]  
$ sudo ls /dev/sd*  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5 /dev/sdb
```

2. List the current hard disk partition table.

a. **sudo parted -l**

```
(carl-lochstampfor@kali)-[~]  
$ sudo parted -l  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sda: 26.8GB  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  


| Number | Start  | End    | Size   | Type     | File system    | Flags |
|--------|--------|--------|--------|----------|----------------|-------|
| 1      | 1049kB | 25.4GB | 25.4GB | primary  | ext4           | boot  |
| 2      | 25.4GB | 26.8GB | 1425MB | extended |                | lba   |
| 5      | 25.4GB | 26.8GB | 1425MB | logical  | linux-swap(v1) | swap  |

  
Error: /dev/sdb: unrecognised disk label  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sdb: 2147MB  
Sector size (logical/physical): 512B/512B  
Partition Table: unknown  
Disk Flags:
```

3. View and verify the new created Disk/Drive (i.e., 2 GiB)
 - a. `sudo fdisk -l`

```
(carl-lochstampfor@kali)-[~]
$ sudo fdisk -l
[sudo] password for carl-lochstampfor:
Disk /dev/sda: 25 GiB, 26843545600 bytes, 52428800 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: 0xa603cfb6

Device      Boot      Start      End  Sectors  Size Id Type
/dev/sda1   *          2048 49641471 49639424 23.7G 83 Linux
/dev/sda2             49643518 52426751 2783234  1.3G  f W95 Ext'd (LBA)
/dev/sda5             49643520 52426751 2783232  1.3G 82 Linux swap / Solaris

Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 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
```


Part III – Creating Partitions and Filesystems (60 points)

Submit the screenshot for All the three eight steps.

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

Command >>

1. Start the partitioning process.
 - a. **sudo fdisk /dev/sdb**

```
(carl-lochstampfor@kali)-[~]
$ sudo fdisk /dev/sdb

Welcome to fdisk (util-linux 2.40.4).
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 (MBR) disklabel with disk identifier 0xbc276615.

Command (m for help):
```

2. Chose the default settings for each line of request
 - a. **p for primary; 1 for default; Enter for default; Enter for default**

```
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 (2048-4194303, default 2048):

Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-4194303, default 4194303):

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

Command (m for help):
```

3. Verified the changes by printing the partition table (input **p**), then writing and saving the changes (input **w**) to the disk, exiting **fdisk**.

```

Command (m for help): p

Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 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: 0xbc276615

Device      Boot Start      End Sectors Size Id Type
/dev/sdb1           2048 4194303 4192256  2G 83 Linux

Command (m for help): w

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

```

4. View and verify the new changes using the command, **sudo fdisk -l**

```

(carl-lochstampfor@kali)-[~]
$ sudo fdisk -l
Disk /dev/sda: 25 GiB, 26843545600 bytes, 52428800 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: 0xa603cfb6

Device      Boot      Start      End Sectors Size Id Type
/dev/sda1   *           2048 49641471 49639424 23.7G 83 Linux
/dev/sda2             49643518 52426751 2783234  1.3G  f W95 Ext'd (LBA)
/dev/sda5             49643520 52426751 2783232  1.3G  82 Linux swap / Solaris

Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 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: 0xbc276615

Device      Boot Start      End Sectors Size Id Type
/dev/sdb1           2048 4194303 4192256  2G 83 Linux

```

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

Command >>

1. Creating an ext4 filesystem on the new partition.

a. `sudo mkfs.ext 3 /dev/sdb1`

```
(carl-lochstampfor@kali)-[~]  
$ sudo mkfs.ext4 /dev/sdb1  
mke2fs 1.47.2 (1-Jan-2025)  
Creating filesystem with 524032 4k blocks and 131072 inodes  
Filesystem UUID: a17f0733-15d3-4249-86d4-a15ee36c4ca6  
Superblock backups stored on blocks:  
        32768, 98304, 163840, 229376, 294912  
File System  
Allocating group tables: done  
Writing inode tables: done  
Creating journal (8192 blocks): done  
Writing superblocks and filesystem accounting information: done
```

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

Command >>

1. Show the current hard disk devices

a. `sudo ls /dev/sd*`

```
(carl-lochstampfor@kali)-[~]  
$ sudo ls /dev/sd*  
/dev/sda  /dev/sda1  /dev/sda2  /dev/sda5  /dev/sdb  /dev/sdb1
```

2. List the current hard disk partitions

- a. **sudo fdisk -l**

```
(carl-lochstampfor@kali)-[~]
$ sudo fdisk -l
Disk /dev/sda: 25 GiB, 26843545600 bytes, 52428800 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: 0xa603cfb6

Device      Boot    Start        End    Sectors    Size Id Type
/dev/sda1   *          2048 49641471 49639424 23.7G 83 Linux
/dev/sda2             49643518 52426751 2783234 1.3G  f W95 Ext'd (LBA)
/dev/sda5             49643520 52426751 2783232 1.3G 82 Linux swap / Solaris

Disk /dev/sdb: 2 GiB, 2147483648 bytes, 4194304 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: 0xbc276615

Device      Boot    Start        End    Sectors    Size Id Type
/dev/sdb1             2048 4194303 4192256 2G 83 Linux
```

3. List the current hard disk partition table.

- a. **sudo parted -l**

```
(carl-lochstampfor@kali)-[~]
$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 26.8GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End     Size    Type     File system  Flags
  1      1049kB  25.4GB  25.4GB  primary  ext4          boot
  2      25.4GB  26.8GB  1425MB  extended lba
  5      25.4GB  26.8GB  1425MB  logical  linux-swap(v1) swap

Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 2147MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number  Start   End     Size    Type     File system  Flags
  1      1049kB  2147MB  2146MB  primary  ext4
```

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

Command >>

1. Making the new directory, then verifying the results.

a. **`sudo mkdir /cyse; ls -ld /cyse`**

```
(carl-lochstampfor@kali)-[~]  
$ sudo mkdir /cyse  
  
(carl-lochstampfor@kali)-[~]  
$ ls -ld /cyse  
drwxr-xr-x 2 root root 4096 Jul  1 21:27 /cyse
```

2. Mounting the new partition *UNDER* this new directory (`/cyse`).

a. **`sudo mount /dev/sdb1 /cyse`**

```
(carl-lochstampfor@kali)-[~]  
$ sudo mount /dev/sdb1 /cyse
```

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

Command >>

- Mounting the new partition *UNDER* this new directory (`/cyse`), then verifying the results.

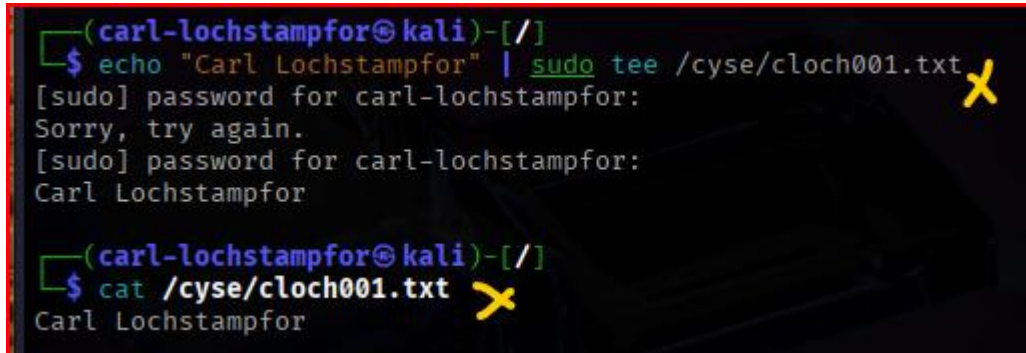
a. **`sudo df` or `df -h`**

```
(carl-lochstampfor@kali)-[~]  
$ sudo mount /dev/sdb1 /cyse ✗  
  
(carl-lochstampfor@kali)-[~]  
$ sudo df ✓  
Filesystem      1K-blocks    Used Available Use% Mounted on  
udev            4002484        0   4002484   0% /dev  
tmpfs            813896        992    812904   1% /run  
/dev/sda1       24253528 14887052   8109108  65% /  
tmpfs            4069476         4   4069472   1% /dev/shm  
tmpfs            5120          0     5120   0% /run/lock  
tmpfs            1024          0     1024   0% /run/credentials/systemd-journald.service  
tmpfs            4069476         8   4069468   1% /tmp  
tmpfs            1024          0     1024   0% /run/credentials/getty@tty1.service  
tmpfs            813892       116    813776   1% /run/user/1000  
/dev/sdb1       2024296        532   1902576   1% /cyse
```


Step 6. Create a new file named for **YourMIDAS.txt** (replace YourMIDAS with **cloch001**) in the directory /cyse and put your name in that file.

Command >>

1. Print my name into /cyse/cloch001.txt.
 - a. **echo "Carl Lochstampfor" | sudo tee /cyse/cloch001.txt**
2. Verify the file content.
 - a. **cat /cyse/cloch001.txt**

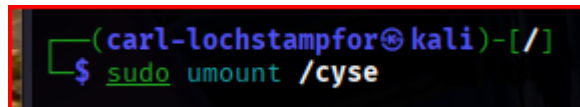


```
(carl-lochstampfor@kali)-[/]  
$ echo "Carl Lochstampfor" | sudo tee /cyse/cloch001.txt  
[sudo] password for carl-lochstampfor:  
Sorry, try again.  
[sudo] password for carl-lochstampfor:  
Carl Lochstampfor  
  
(carl-lochstampfor@kali)-[/]  
$ cat /cyse/cloch001.txt  
Carl Lochstampfor
```

Step 7. Unmount /cyse directory.

Command >>

1. **sudo umount /cyse**



```
(carl-lochstampfor@kali)-[/]  
$ sudo umount /cyse
```

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

Command >>

1. There are no contents within the directory because the mount point directory returns to its prior state *before* anything was mounted there (i.e., when the directory was created, there were no files at the start). The contents remain or reside on the /dev/sdb1 partition.
 - a. In other words, the partition still exists, but since it's not mounted anymore the contents are not visible or reachable through that mount point from the (root unless I remount the partition).

b. `ls -l /cyse; ls -la /cyse`

```
(carl-lochstampfor@kali)-[/]  
$ ls -l /cyse  
total 0
```

```
(carl-lochstampfor@kali)-[/]  
$ ls -la /cyse  
total 8  
drwxr-xr-x  2 root root 4096 Jul  1 21:27 .  
drwxr-xr-x 20 root root 4096 Jul  1 21:27 ..
```