

CYSE 270 Assignment #7 Manage Local Storage

OLD DOMINION UNIVERSITY  
CYSE 270 LINUX SYSTEM FOR CYBERSECURITY

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Assignment #7 Manage Local Storage

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CYSE 270 Assignment #7 Manage Local Storage

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

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

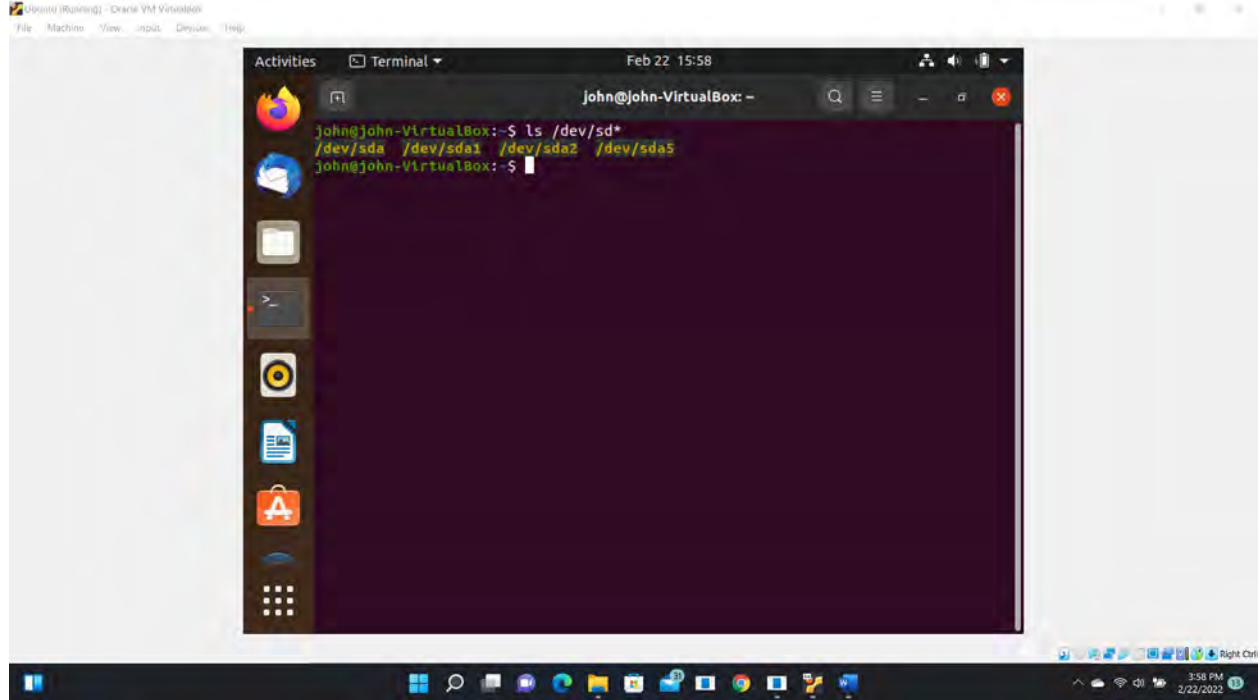


Figure 1 Screenshots of JWILS082 Computer screen for Step 1.

Above is the screen shot using the commands “`ls /dev/sd*`” which shows the current hard disk drives. “`ls`” is the command that lists the files or directories. “`/dev/sd`” are the drives SETA, SCSI, and USB that start with `/dev/sd`.

## CYSE 270 Assignment #7 Manage Local Storage

**Step 2.** Execute the `fdisk -l` command to list the current hard disk partitions.

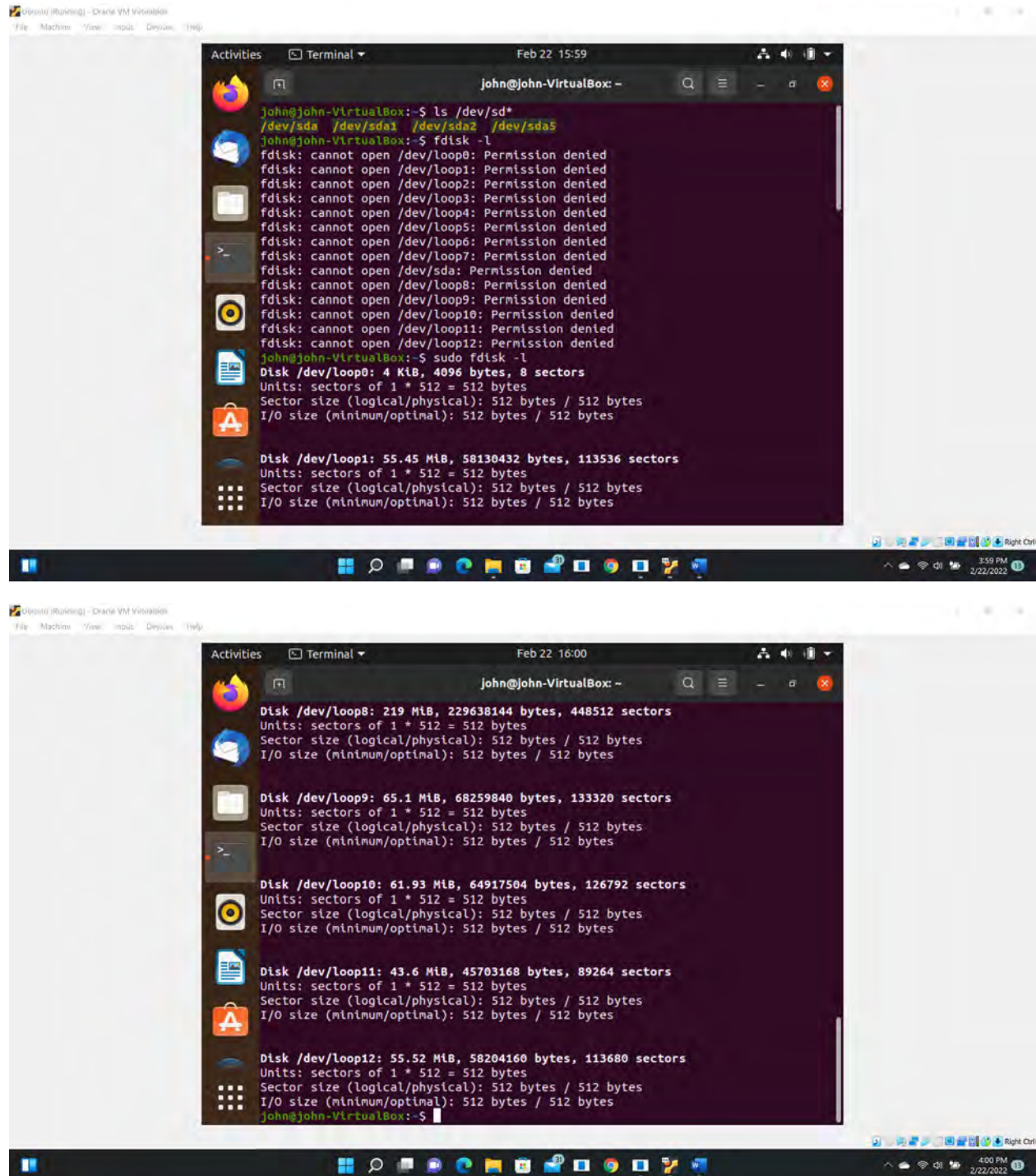


Figure 2 Screenshots of JWILS082 Computer screen for Step 2.

Above is the screen shot using the commands “`sudo fdisk -l`” which shows the current partitions on the disk. “`sudo`” is the command that allows you to run programs with the security privileges of another user (otherwise known as a super user). “`fdisk -l`” is the command that displays the current hard disk partitions.

## CYSE 270 Assignment #7 Manage Local Storage

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

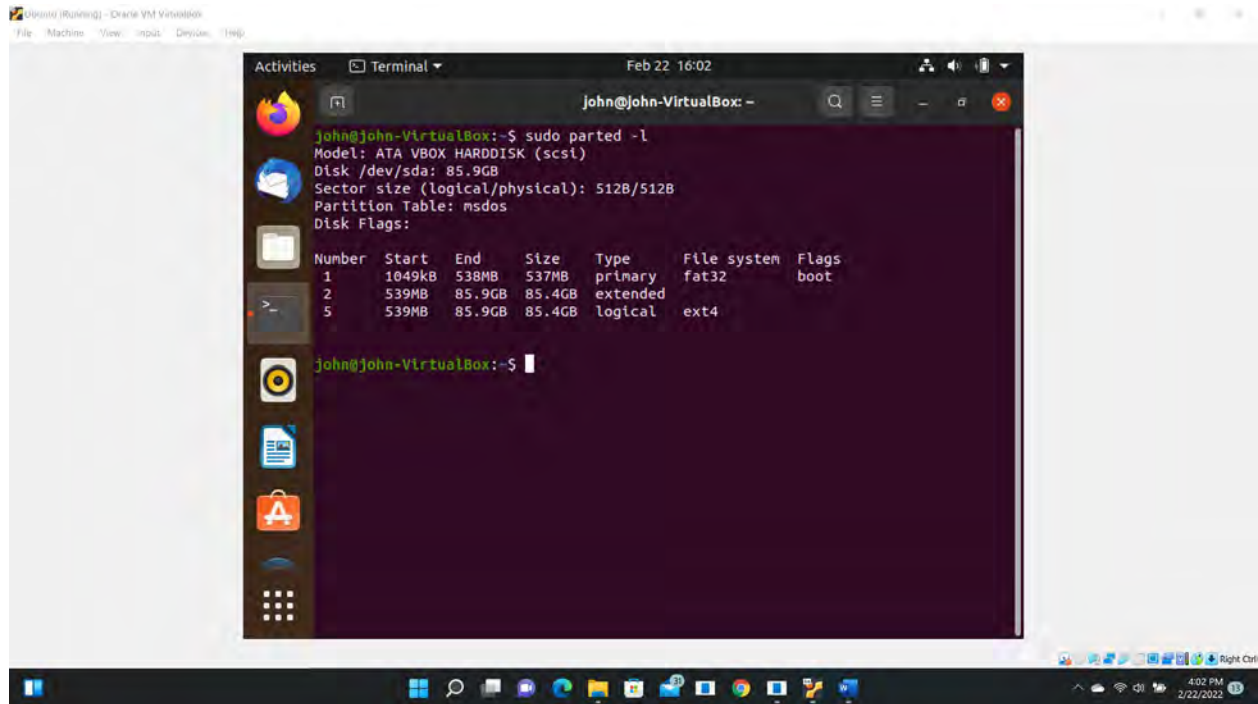


Figure 3 Screenshots of JWILS082 Computer screen for Step 3.

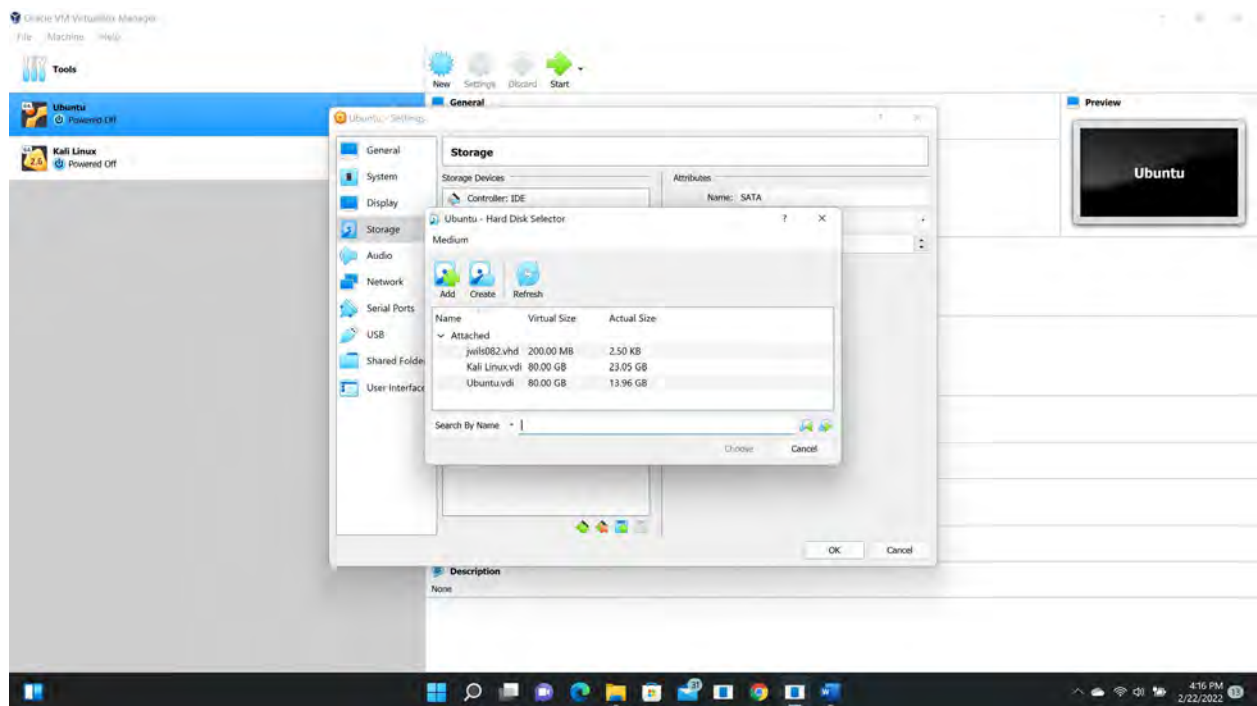
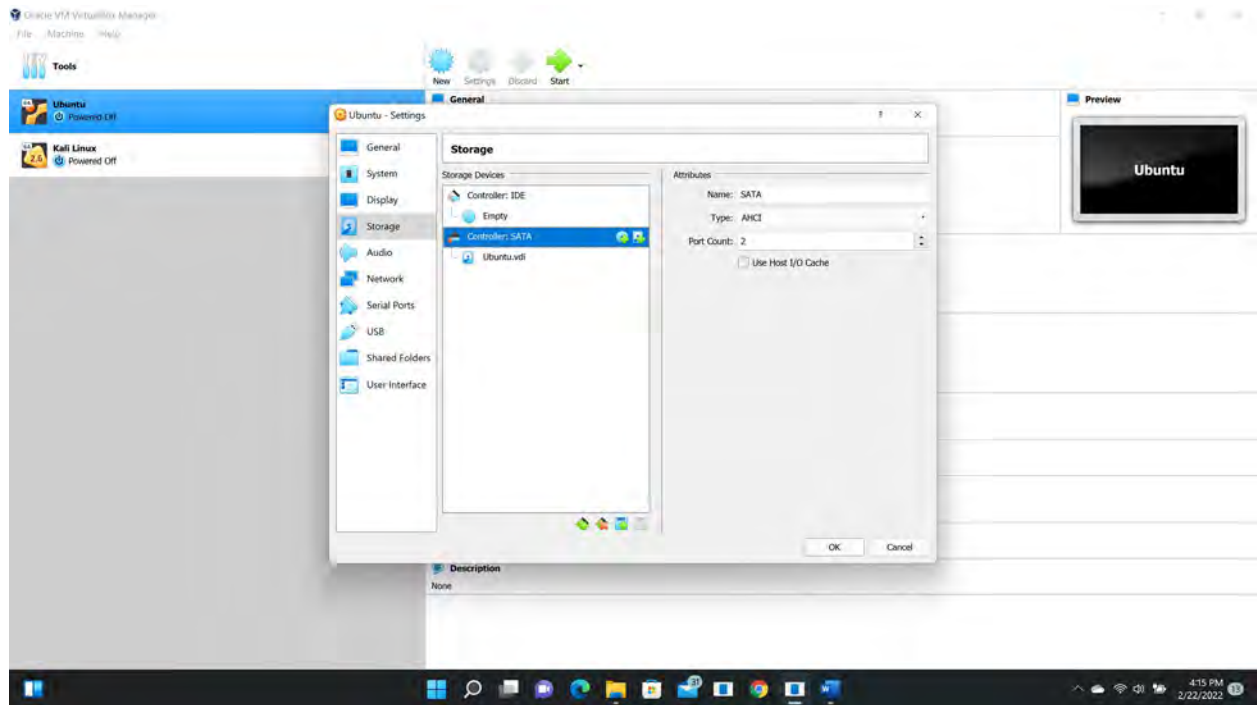
Above is the screen shot using the commands “sudo parted -l” which lists the current partitions table.

## CYSE 270 Assignment #7 Manage Local Storage

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

**Step 1.** In the Oracle VM VirtualBox setting, attach a new virtual hard disk with the size of 200 MB to your current Linux VM. Name it as “your\_midas.vdi”

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



## CYSE 270 Assignment #7 Manage Local Storage

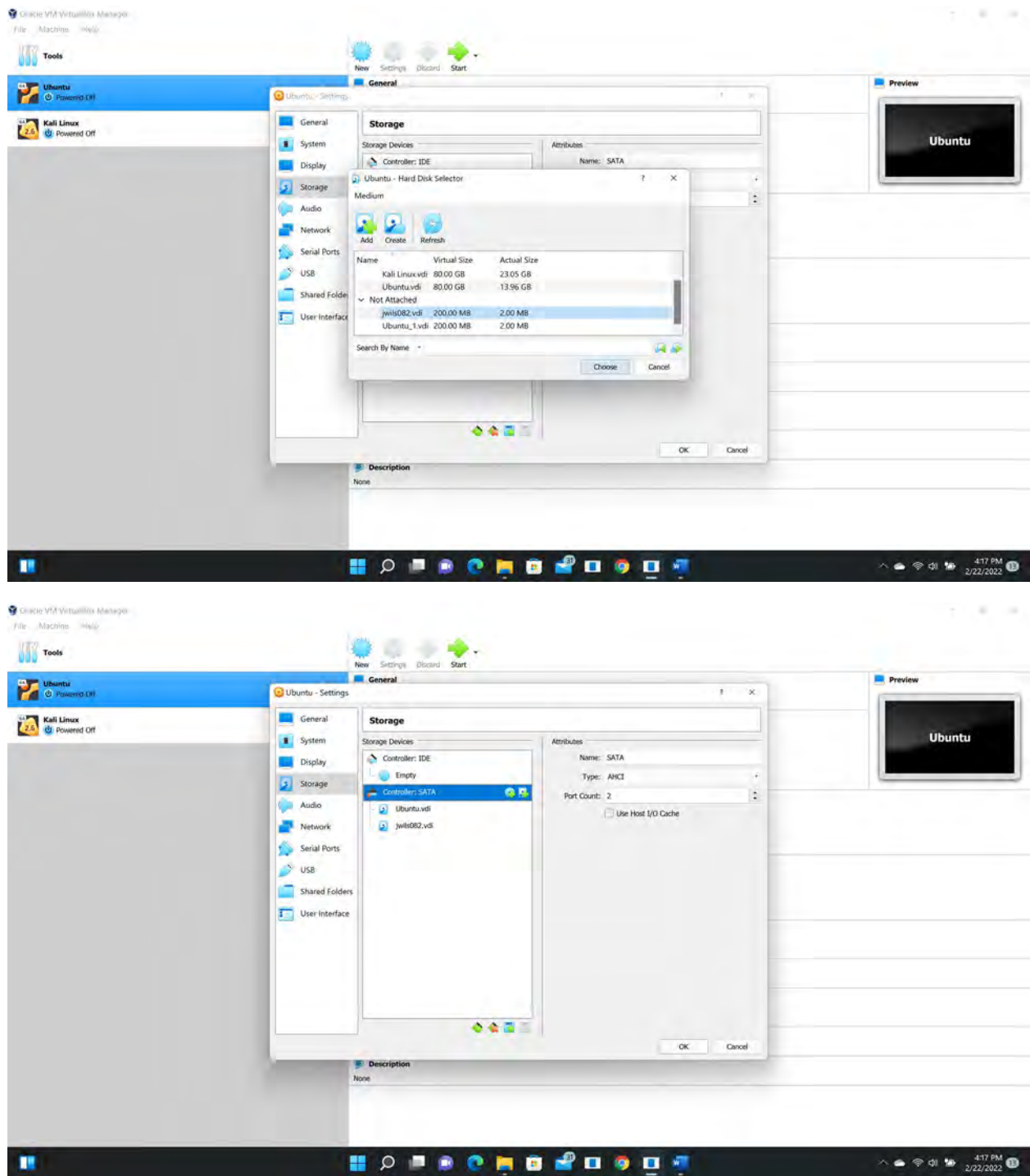


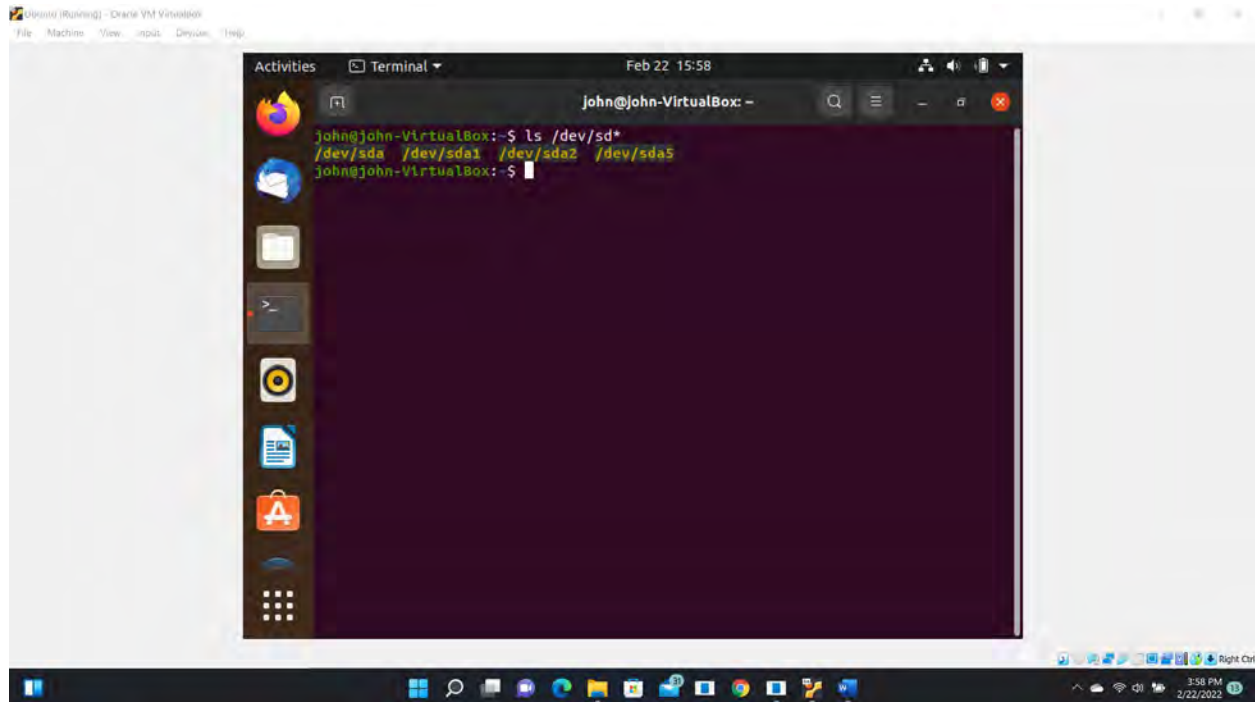
Figure 4 Screenshots of JWILS082 Computer screen for Step 1 and 2.

Above are the screen shots of adding a virtual harddrive with the name “jwils082.vdi” to the existing Ubuntu virtual machine.



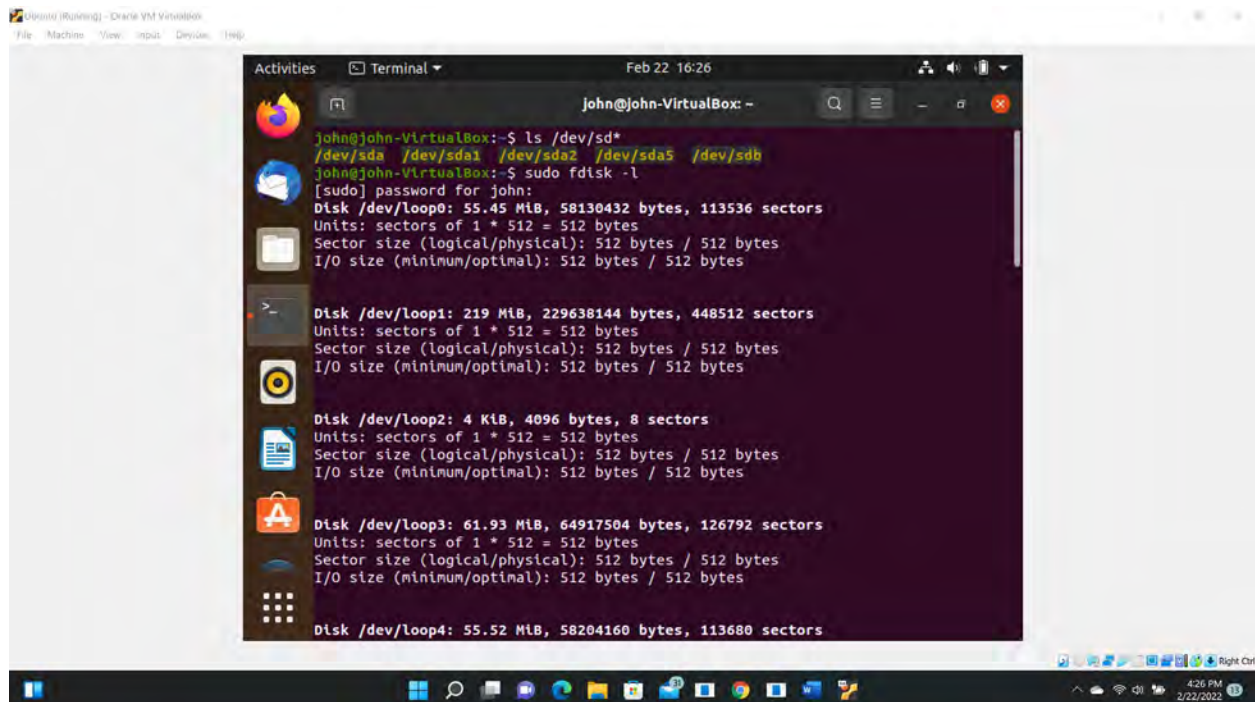
## CYSE 270 Assignment #7 Manage Local Storage

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



The screenshot shows a terminal window titled "John@John-VirtualBox: -" with a search bar and window controls. The terminal output is as follows:

```
John@John-VirtualBox:~$ ls /dev/sd*  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5  
John@John-VirtualBox:~$
```



The screenshot shows a terminal window titled "John@John-VirtualBox: -" with a search bar and window controls. The terminal output is as follows:

```
John@John-VirtualBox:~$ ls /dev/sd*  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5 /dev/sdb  
John@John-VirtualBox:~$ sudo fdisk -l  
[sudo] password for john:  
Disk /dev/loop0: 55.45 MiB, 58130432 bytes, 113536 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/loop1: 219 MiB, 229638144 bytes, 448512 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/loop2: 4 KiB, 4096 bytes, 8 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/loop3: 61.93 MiB, 64917504 bytes, 126792 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/loop4: 55.52 MiB, 58204160 bytes, 113680 sectors
```

## CYSE 270 Assignment #7 Manage Local Storage

The image shows two screenshots of a VirtualBox terminal window. The top screenshot shows disk information for /dev/loop4, /dev/loop5, /dev/loop6, /dev/loop7, and /dev/sda. The bottom screenshot shows disk information for /dev/sda, /dev/sdb, /dev/loop8, and /dev/loop9, along with a table of disk partitions.

**Top Screenshot:**

```
john@John-VirtualBox: ~  
Disk /dev/loop4: 55.52 MiB, 58204160 bytes, 113680 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/loop5: 248.78 MiB, 260841472 bytes, 509456 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/loop6: 50.98 MiB, 53432320 bytes, 104360 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/loop7: 65.22 MiB, 68378624 bytes, 133552 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/sda: 80 GiB, 85899345920 bytes, 167772160 sectors  
Disk model: VBOX HARDDISK
```

**Bottom Screenshot:**

```
john@John-VirtualBox: ~  
Disk /dev/sda: 80 GiB, 85899345920 bytes, 167772160 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: 0x0a974e20  
  
Device      Boot      Start          End      Sectors  Size Id Type  
/dev/sda1   *            2048      1050623      1048576   512M  b W95 FAT32  
/dev/sda2             1052670    167770111    166717442   79.5G  5 Extended  
/dev/sda5             1052672    167770111    166717440   79.5G  83 Linux  
  
Disk /dev/sdb: 200 MiB, 209715200 bytes, 409600 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  
  
Disk /dev/loop8: 219 MiB, 229638144 bytes, 448512 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: 65.1 MiB, 68259840 bytes, 133320 sectors  
Units: sectors of 1 * 512 = 512 bytes
```



## CYSE 270 Assignment #7 Manage Local Storage

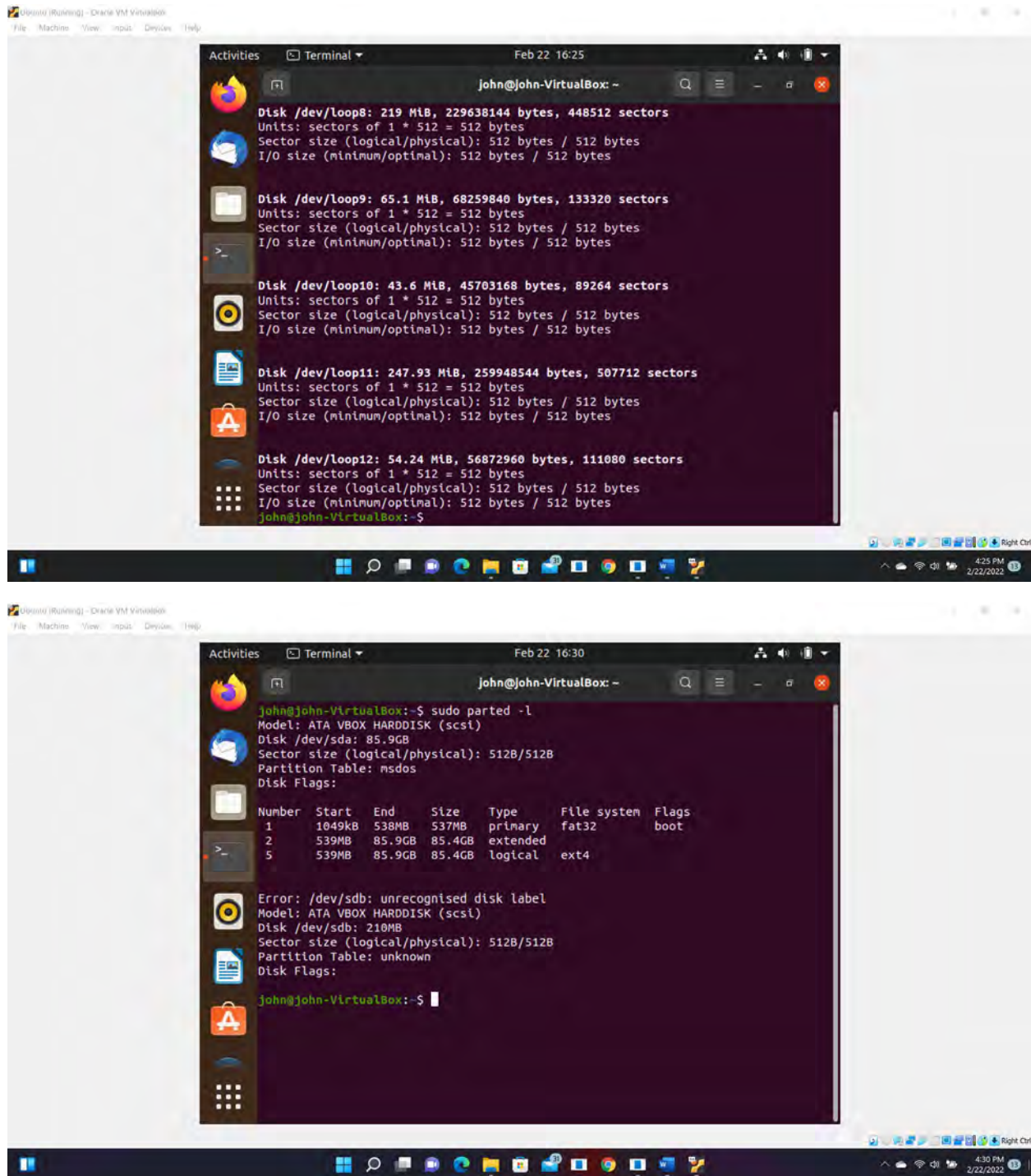


Figure 5 Screenshots of JWILS082 Computer screen for Step 3.

Above are the screen shots showing the differences of the virtual disks before and after the addition of “jwils082.vdi”. The first shot is of before and the second shot is after the addition. Please notice that “/dev/sdb” is the addition.

I also ran the command “sudo fdisk -l” to show the additional partitions.

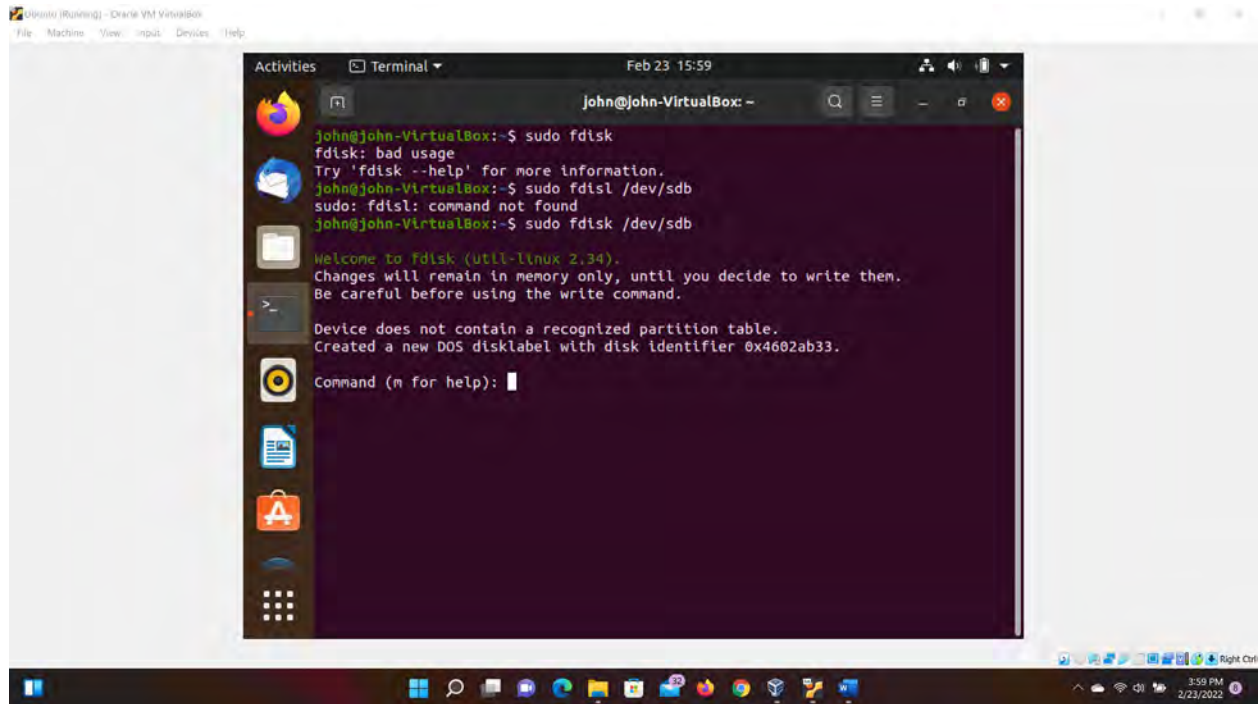
## CYSE 270 Assignment #7 Manage Local Storage

Above is the screen shot using the commands “sudo parted -l” which lists the current partitions table.

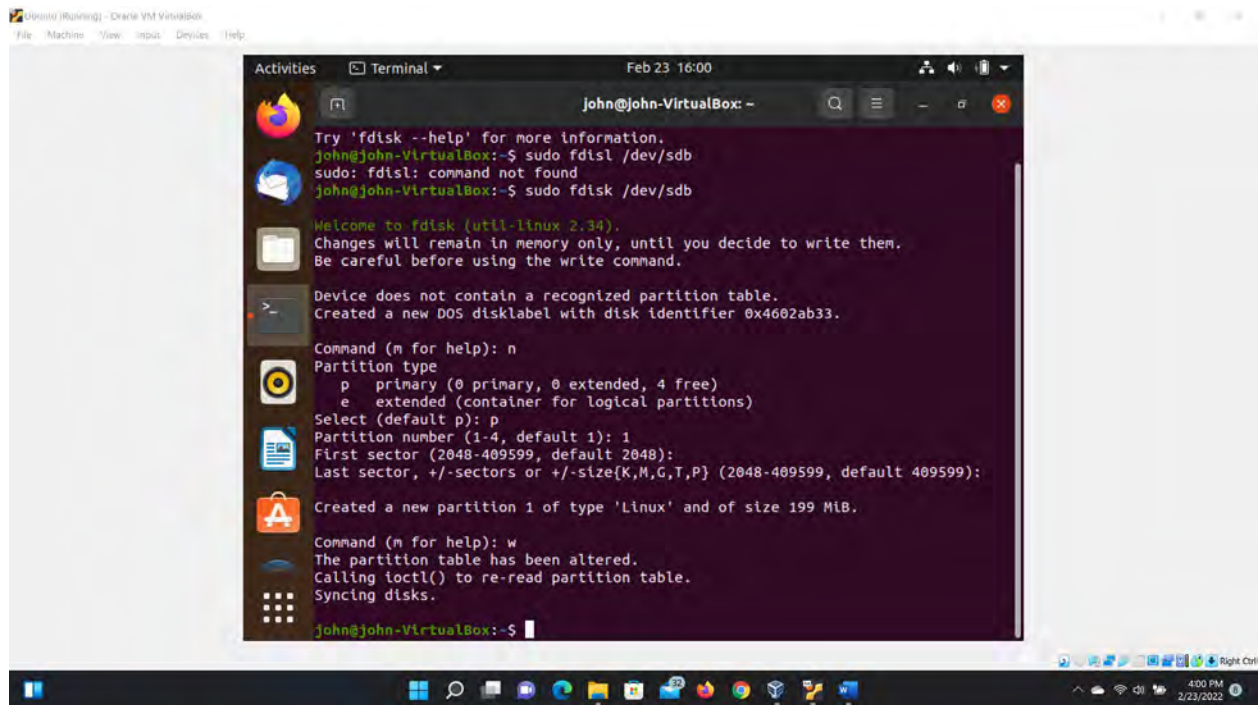
## CYSE 270 Assignment #7 Manage Local Storage

### **Part III**– Creating Partitions and Filesystems (60 points)

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

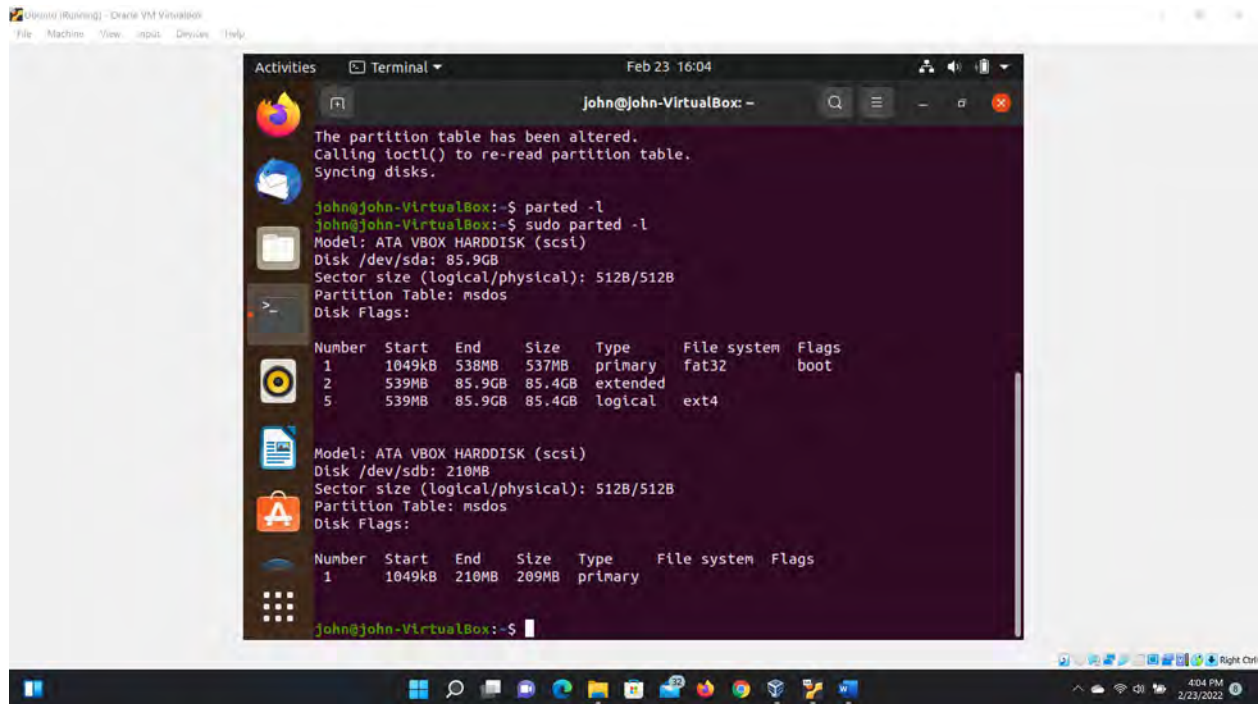


```
john@john-VirtualBox: ~  
john@john-VirtualBox:~$ sudo fdisk  
fdisk: bad usage  
Try 'fdisk --help' for more information.  
john@john-VirtualBox:~$ sudo fdisk /dev/sdb  
sudo: fdisk: command not found  
john@john-VirtualBox:~$ sudo fdisk /dev/sdb  
  
Welcome to fdisk (util-linux 2.34).  
Changes 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 0x4602ab33.  
  
Command (m for help):
```



```
john@john-VirtualBox: ~  
Try 'fdisk --help' for more information.  
john@john-VirtualBox:~$ sudo fdisk /dev/sdb  
sudo: fdisk: command not found  
john@john-VirtualBox:~$ sudo fdisk /dev/sdb  
  
Welcome to fdisk (util-linux 2.34).  
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 0x4602ab33.  
  
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 (2048-409599, default 2048):  
Last sector, +/-sectors or +/-size[K,M,G,T,P] (2048-409599, default 409599):  
  
Created a new partition 1 of type 'Linux' and of size 199 MiB.  
  
Command (m for help): w  
The partition table has been altered.  
Calling ioctl() to re-read partition table.  
Syncing disks.  
john@john-VirtualBox:~$
```

## CYSE 270 Assignment #7 Manage Local Storage



The screenshot shows a terminal window titled "John@John-VirtualBox: ~" with a date and time of "Feb 23 16:04". The terminal displays the following text:

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

john@john-VirtualBox:~$ parted -l
john@john-VirtualBox:~$ sudo parted -l
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 85.9GB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number      Start   End     Size    Type     File system  Flags
 1          1049kB  538MB   537MB   primary  fat32        boot
 2          539MB   85.9GB  85.4GB   extended
 5          539MB   85.9GB  85.4GB   logical  ext4

Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sdb: 210MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number      Start   End     Size    Type     File system  Flags
 1          1049kB  210MB   209MB   primary
```

The terminal window is part of a desktop environment with a taskbar at the bottom showing various application icons and a system tray on the right with the date "4:04 PM 2/23/2022".

Figure 6 Screenshots of JWILS082 Computer screen for Step 1.

Above are the screen shots showing the command “sudo fdisk /dev/sdb” which creates a partition on the virtual drive.

I also used the command “sudo parted -l” to validate the partition was created.



## CYSE 270 Assignment #7 Manage Local Storage

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

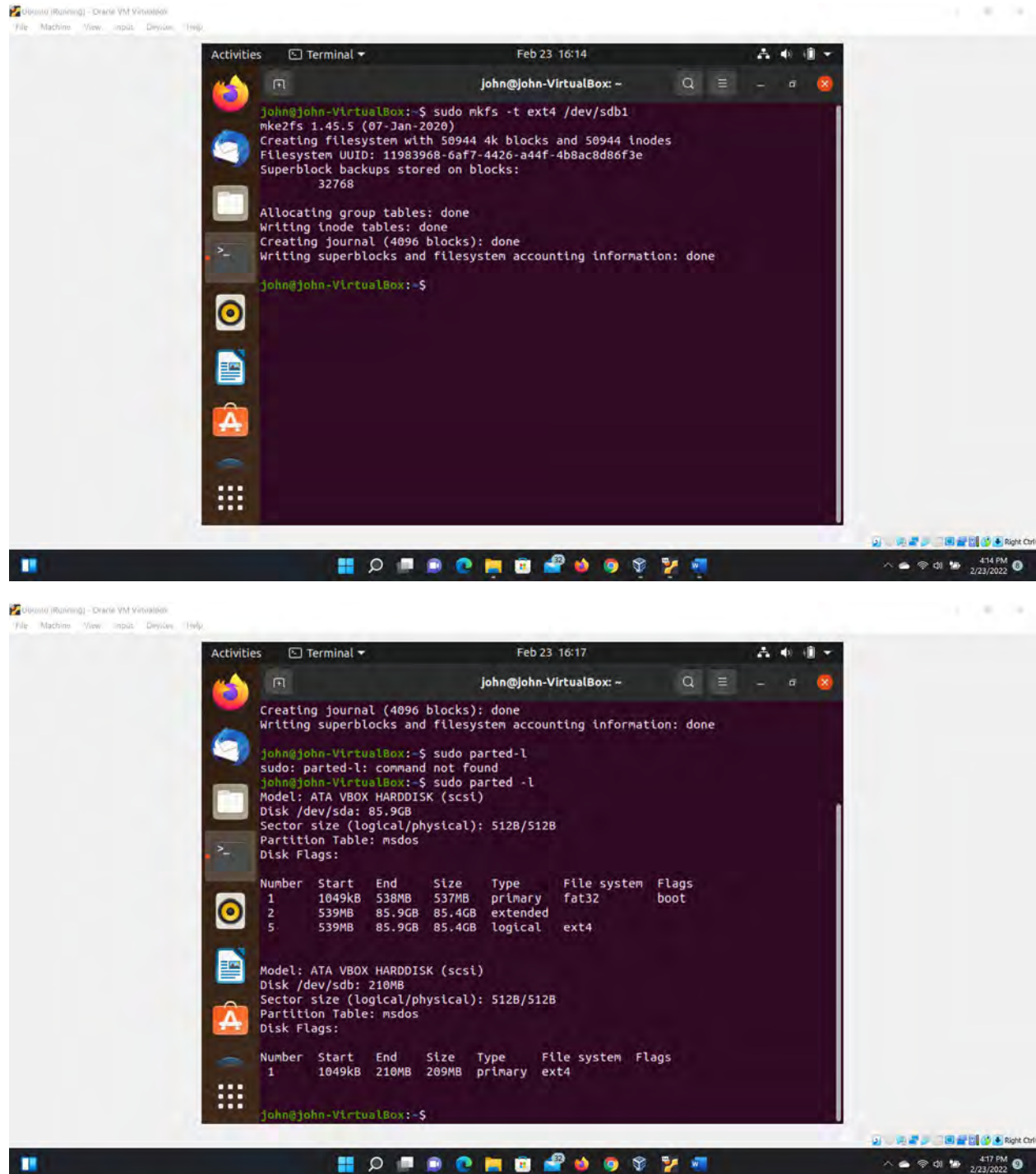


Figure 7 Screenshots of JWILS082 Computer screen for Step 2.

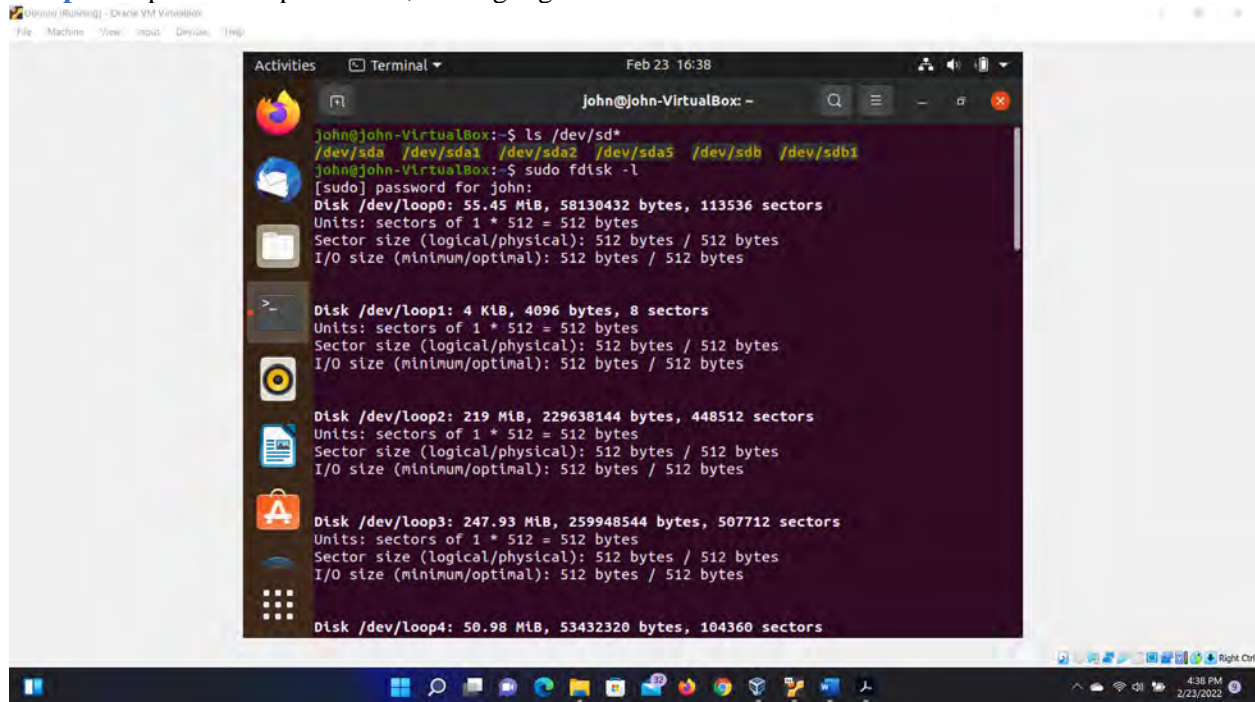
Above are the screen shots showing the command “`sudo mkfs -t ext4 /dev/sdb1`” which creates an ext4 filesystem on partition `sdb1`.

I also used the command “`sudo parted -l`” to validate the ext4 file system was created.

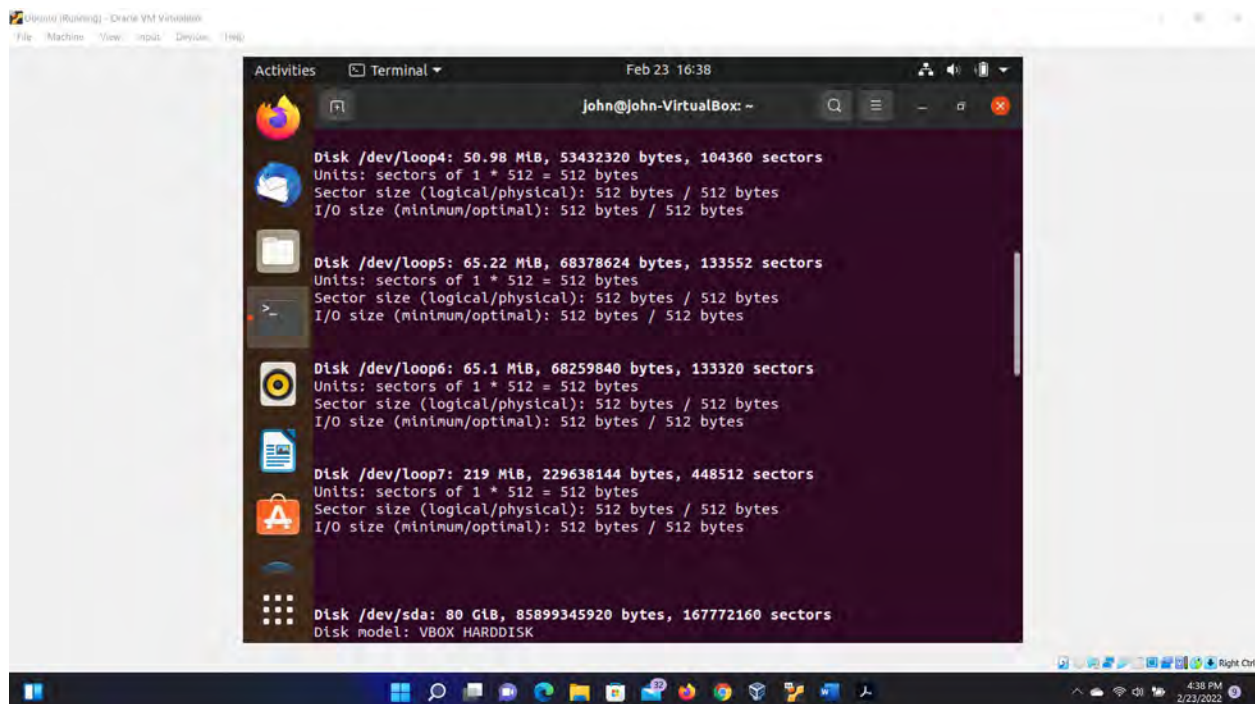


## CYSE 270 Assignment #7 Manage Local Storage

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

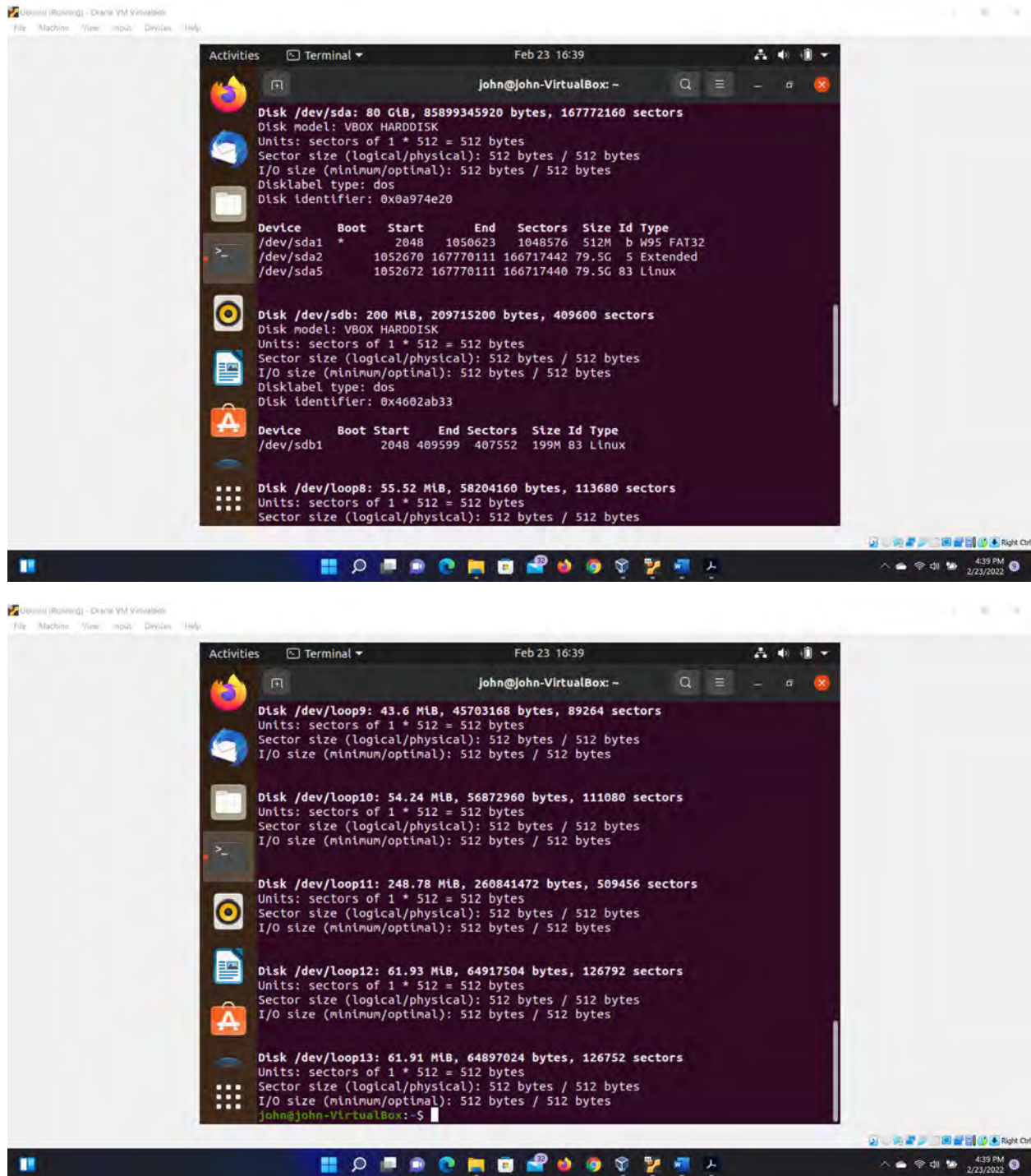


```
john@john-VirtualBox:~$ ls /dev/sd*  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda3 /dev/sdb /dev/sdb1  
john@john-VirtualBox:~$ sudo fdisk -l  
[sudo] password for john:  
Disk /dev/loop0: 55.45 MiB, 58130432 bytes, 113536 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
  
Disk /dev/loop1: 4 KiB, 4096 bytes, 8 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/loop2: 219 MiB, 229638144 bytes, 448512 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/loop3: 247.93 MiB, 259948544 bytes, 507712 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/loop4: 50.98 MiB, 53432320 bytes, 104360 sectors
```



```
john@john-VirtualBox:~$  
Disk /dev/loop4: 50.98 MiB, 53432320 bytes, 104360 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/loop5: 65.22 MiB, 68378624 bytes, 133552 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/loop6: 65.1 MiB, 68259840 bytes, 133320 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/loop7: 219 MiB, 229638144 bytes, 448512 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/sda: 80 GiB, 85899345920 bytes, 167772160 sectors  
Disk model: VBOX HARDDISK
```

## CYSE 270 Assignment #7 Manage Local Storage



The image displays two screenshots of a Linux terminal window, likely running in a virtual machine (John@John-VirtualBox). The terminal shows the output of the `lsblk` command, providing detailed information about the system's storage devices.

**Top Screenshot:**

```
john@John-VirtualBox: ~  
Disk /dev/sda: 80 GiB, 85899345920 bytes, 167772160 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: 0x0a974e20  
  
Device      Boot      Start        End    Sectors    Size Id Type  
-----  
/dev/sda1   *          2048      1050623   1048576    512M b W95 FAT32  
/dev/sda2             1052670  167770111  166717442   79.5G 5 Extended  
/dev/sda5             1052672  167770111  166717440   79.5G 83 Linux  
  
Disk /dev/sdb: 200 MiB, 209715200 bytes, 409600 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: 0x4002ab33  
  
Device      Boot      Start        End    Sectors    Size Id Type  
-----  
/dev/sdb1             2048    409599    407552    199M 83 Linux  
  
Disk /dev/loop8: 55.52 MiB, 58204160 bytes, 113680 sectors  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes
```

**Bottom Screenshot:**

```
john@John-VirtualBox: ~  
Disk /dev/loop9: 43.6 MiB, 45703168 bytes, 89264 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: 54.24 MiB, 56872960 bytes, 111080 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: 248.78 MiB, 260841472 bytes, 509456 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: 61.93 MiB, 64917504 bytes, 126792 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: 61.91 MiB, 64897024 bytes, 126752 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  
john@John-VirtualBox:~$
```

## CYSE 270 Assignment #7 Manage Local Storage

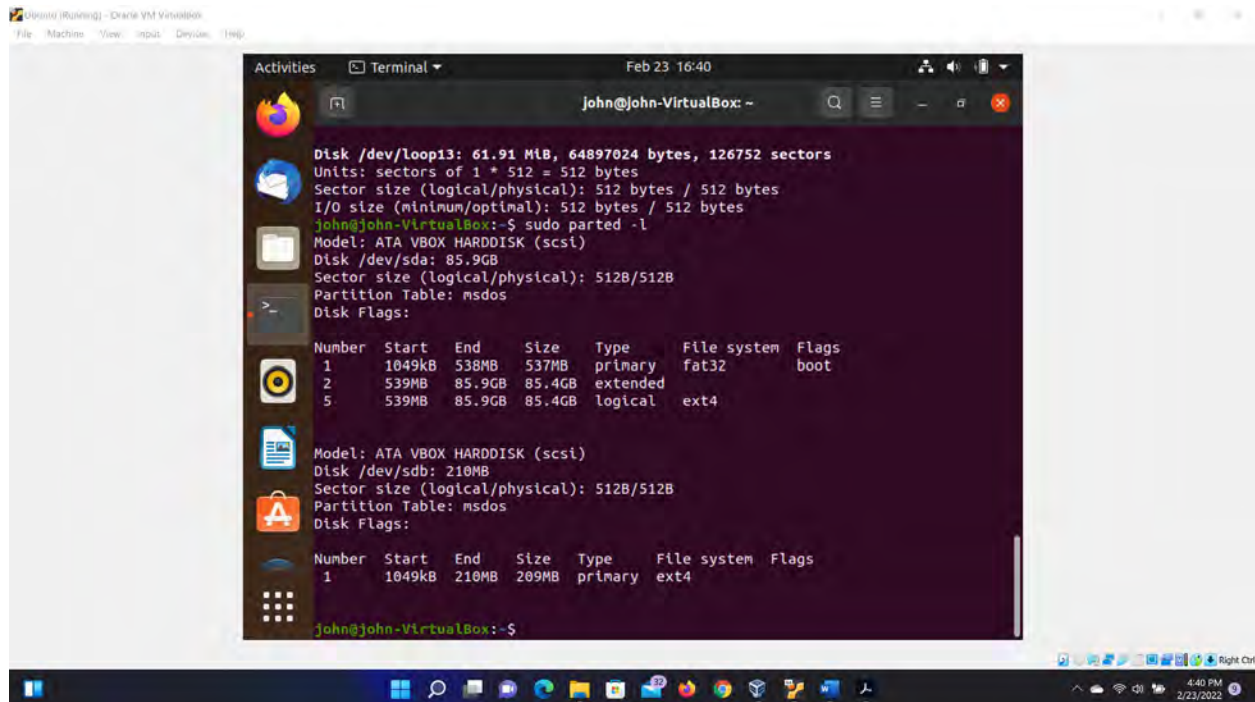


Figure 8 Screenshots of JWILS082 Computer screen for Step 3.

Above is the screen shot using the commands “ls /dev/sd\*” which shows the current hard disk drives. “ls” is the command that lists the files or directories. “/dev/sd” are the drives SETA, SCSI, and USB that start with /dev/sd\*

I also used the command “sudo fdisk -l” which shows the current partitions on the disk. “sudo” is the command that allows you to run programs with the security privileges of another user (otherwise known as a super user). “fdisk -l” is the command that displays the current har disk partitions.

I also used the command “sudo parted -l” to validate the ext4 file system was created. . “sudo” is the command that allows you to run programs with the security privileges of another user (otherwise known as a super user). “parted -l” is the command that displays the current hardisk partition table.



## CYSE 270 Assignment #7 Manage Local Storage

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

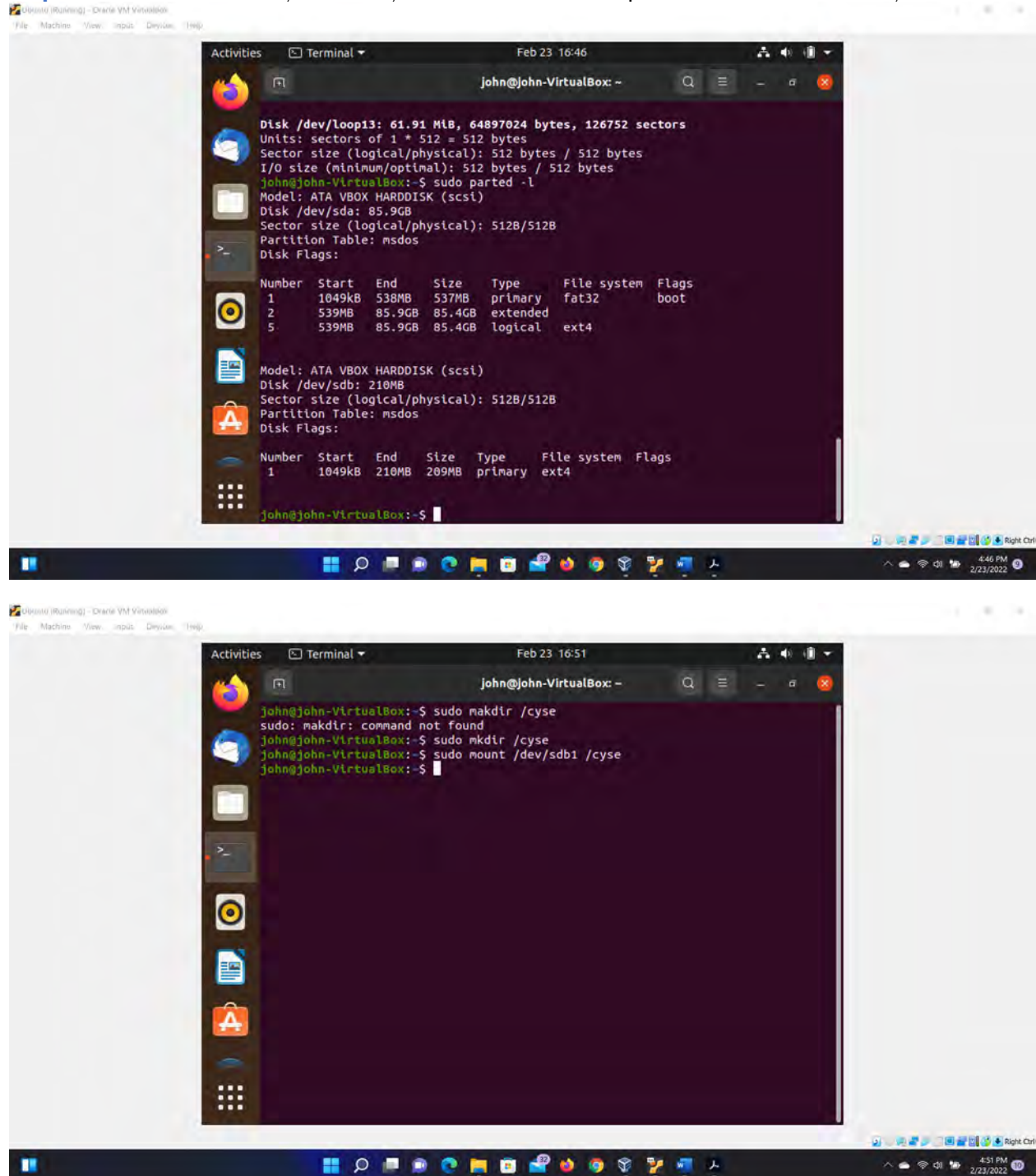


Figure 9 Screenshots of JWILS082 Computer screen for Step 4.

Above is the screen shot using the commands “mkdir /cyse” which makes a new directory that will be mounted with the new partition /dev/sdb1. “mkdir” is the command that creates a new directory. “/cyse” is the name and location of the new directory.

I then used the command “sudo mount /dev/sdb1 /cyse” to mount the partition under the directory /cyse.

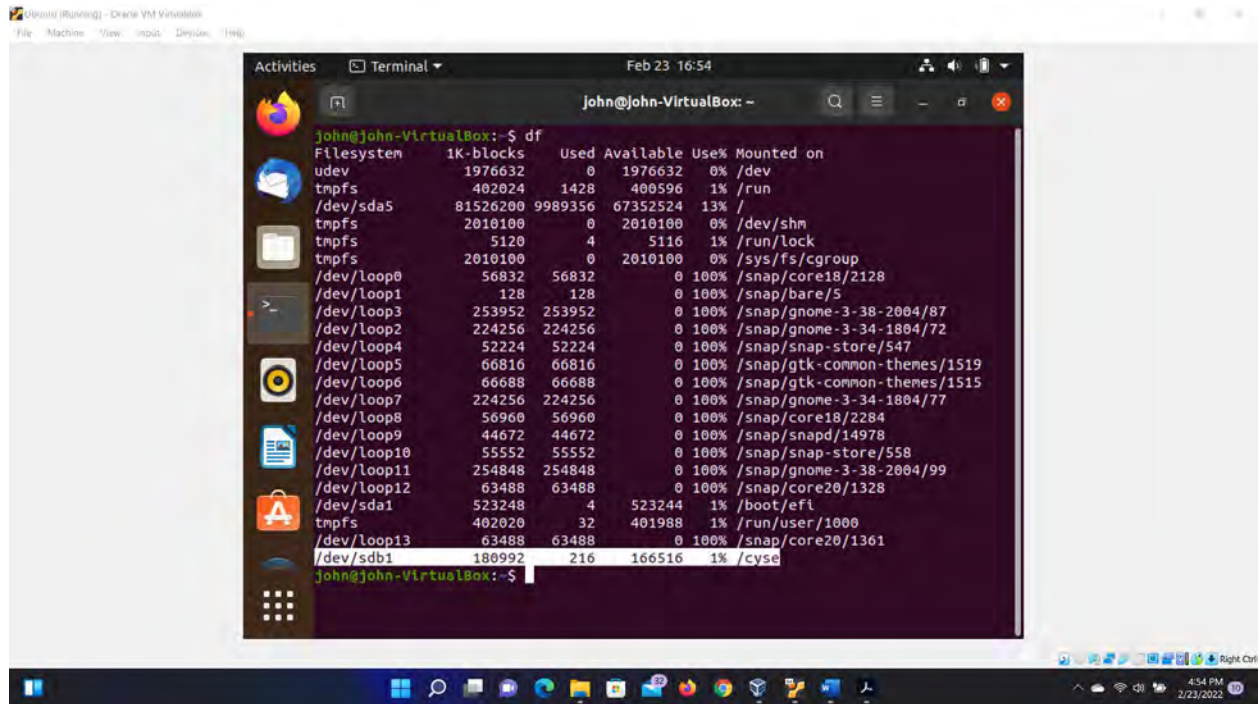
## CYSE 270 Assignment #7 Manage Local Storage

“sudo” is the command that allows you to run programs with the security privileges of another user (otherwise known as a super user). “mount” is the command that mounts a device to a mount point. “/dev/sdb1” is the partition that you want to mount. “/cyse” is the name of the directory that the partition will be mounted.



## CYSE 270 Assignment #7 Manage Local Storage

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



The screenshot shows a terminal window titled "John@John-VirtualBox: ~" with the command `df` executed. The output is a table showing disk space usage for various filesystems. The filesystem `/dev/sdb1` is highlighted, showing it is mounted at `/cyse` with 1% usage.

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
udev	1976632	0	1976632	0%	/dev
tmpfs	402024	1428	400596	1%	/run
/dev/sda5	81526200	9989356	67352524	13%	/
tmpfs	2010100	0	2010100	0%	/dev/shm
tmpfs	5120	4	5116	1%	/run/lock
tmpfs	2010100	0	2010100	0%	/sys/fs/cgroup
/dev/loop0	56832	56832	0	100%	/snap/core18/2128
/dev/loop1	128	128	0	100%	/snap/bare/5
/dev/loop3	253952	253952	0	100%	/snap/gnome-3-38-2004/87
/dev/loop2	224256	224256	0	100%	/snap/gnome-3-34-1804/72
/dev/loop4	52224	52224	0	100%	/snap/snap-store/547
/dev/loop5	66816	66816	0	100%	/snap/gtk-common-themes/1519
/dev/loop6	66688	66688	0	100%	/snap/gtk-common-themes/1515
/dev/loop7	224256	224256	0	100%	/snap/gnome-3-34-1804/77
/dev/loop8	56960	56960	0	100%	/snap/core18/2284
/dev/loop9	44672	44672	0	100%	/snap/snapd/14978
/dev/loop10	55552	55552	0	100%	/snap/snap-store/558
/dev/loop11	254848	254848	0	100%	/snap/gnome-3-38-2004/99
/dev/loop12	63488	63488	0	100%	/snap/core20/1328
/dev/sda1	523248	4	523244	1%	/boot/efi
tmpfs	402020	32	401988	1%	/run/user/1000
/dev/loop13	63488	63488	0	100%	/snap/core20/1361
/dev/sdb1	180992	216	166516	1%	/cyse

Figure 10 Screenshots of JWILS082 Computer screen for Step 5.

Above is the screen shot using the commands “`df`” which validates the mount to the directory was successful.

## CYSE 270 Assignment #7 Manage Local Storage

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

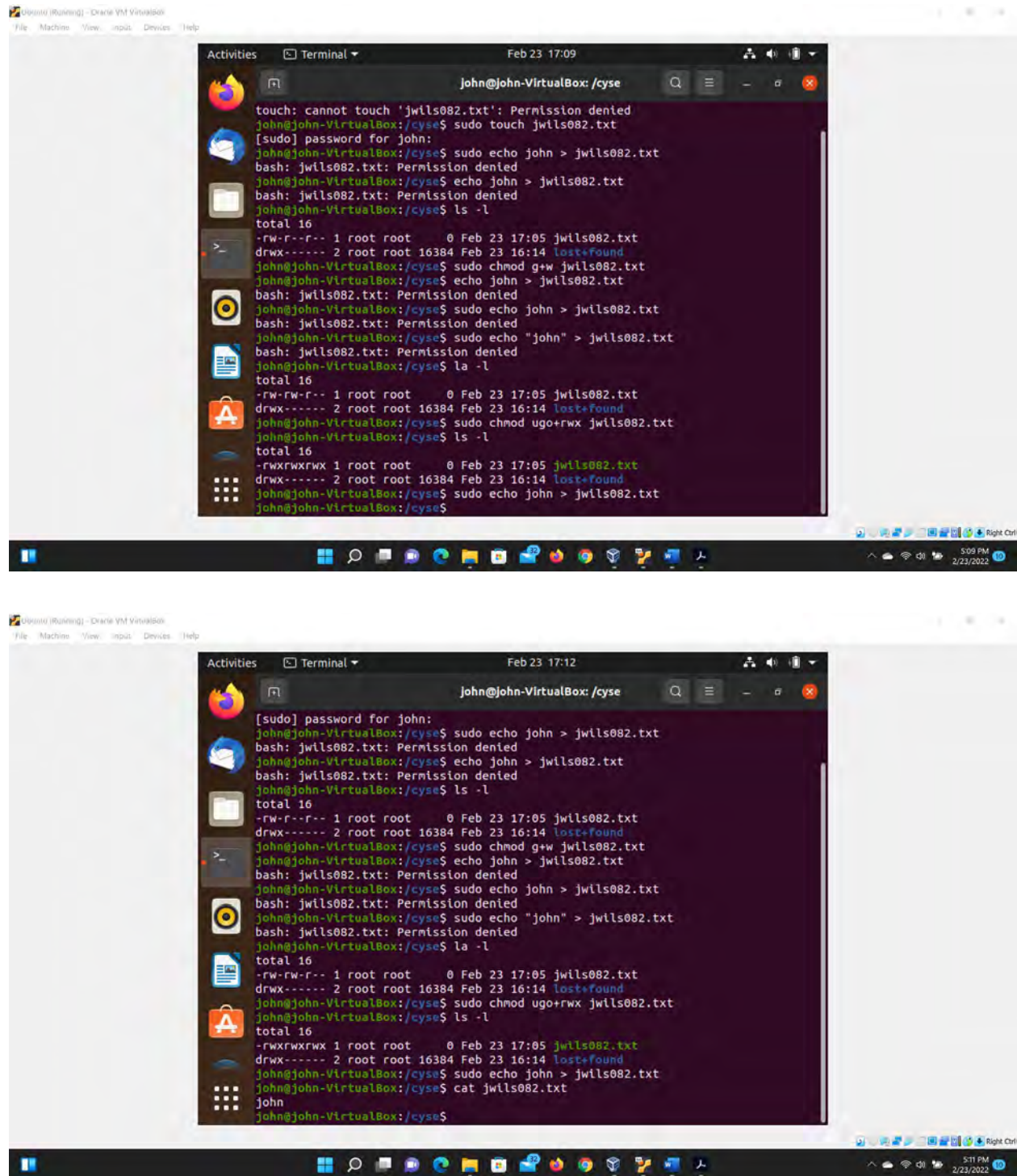


Figure 11 Screenshots of JWILS082 Computer screen for Step 6.

Above is the screen shot using the commands "cd /cyse" to change to the directory /cyse.

## CYSE 270 Assignment #7 Manage Local Storage

I also used the command “touch jwils082.txt” to create a file in the /cyse directory.

I then used the command “echo John > jwils082.txt” to place my name into the file jwils082.txt. as you can see I had a tad bit of trouble adding the name to the file without changing the permission. To do this I used the command “sudo chmod ugo+rw jwils082.txt” to give god like permissions to this file. I know this is not a secure way to do this. I probably should have just done the command “chmod g+rw jwils082.txt”.

I also did the command “cat jwils082.txt” to validate the name “John” was placed in the file.

## CYSE 270 Assignment #7 Manage Local Storage

### Step 7. Unmount /cyse directory.

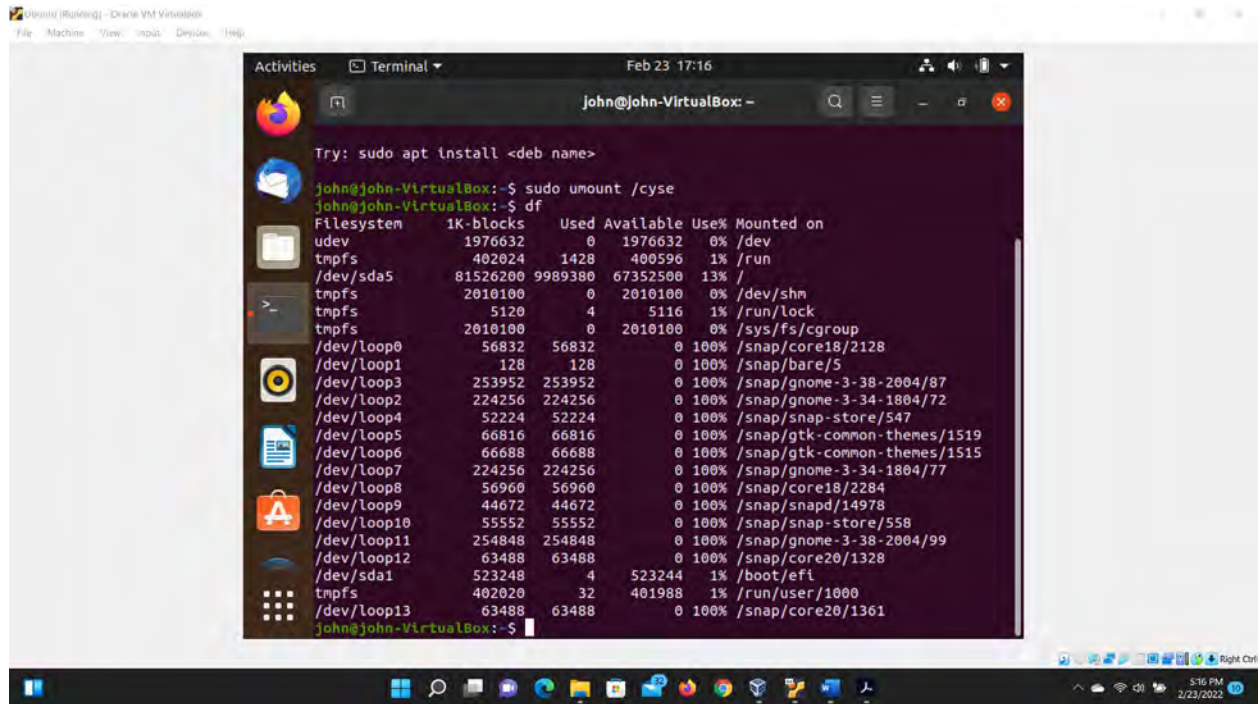


Figure 12 Screenshots of JWILSO82 Computer screen for Step 7.

Above is the screen shot using the commands “umount /cyse” to unmount the device from the directory.

I then used the command “df” to validate the device unmounted from the directory /cyse.



## CYSE 270 Assignment #7 Manage Local Storage

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

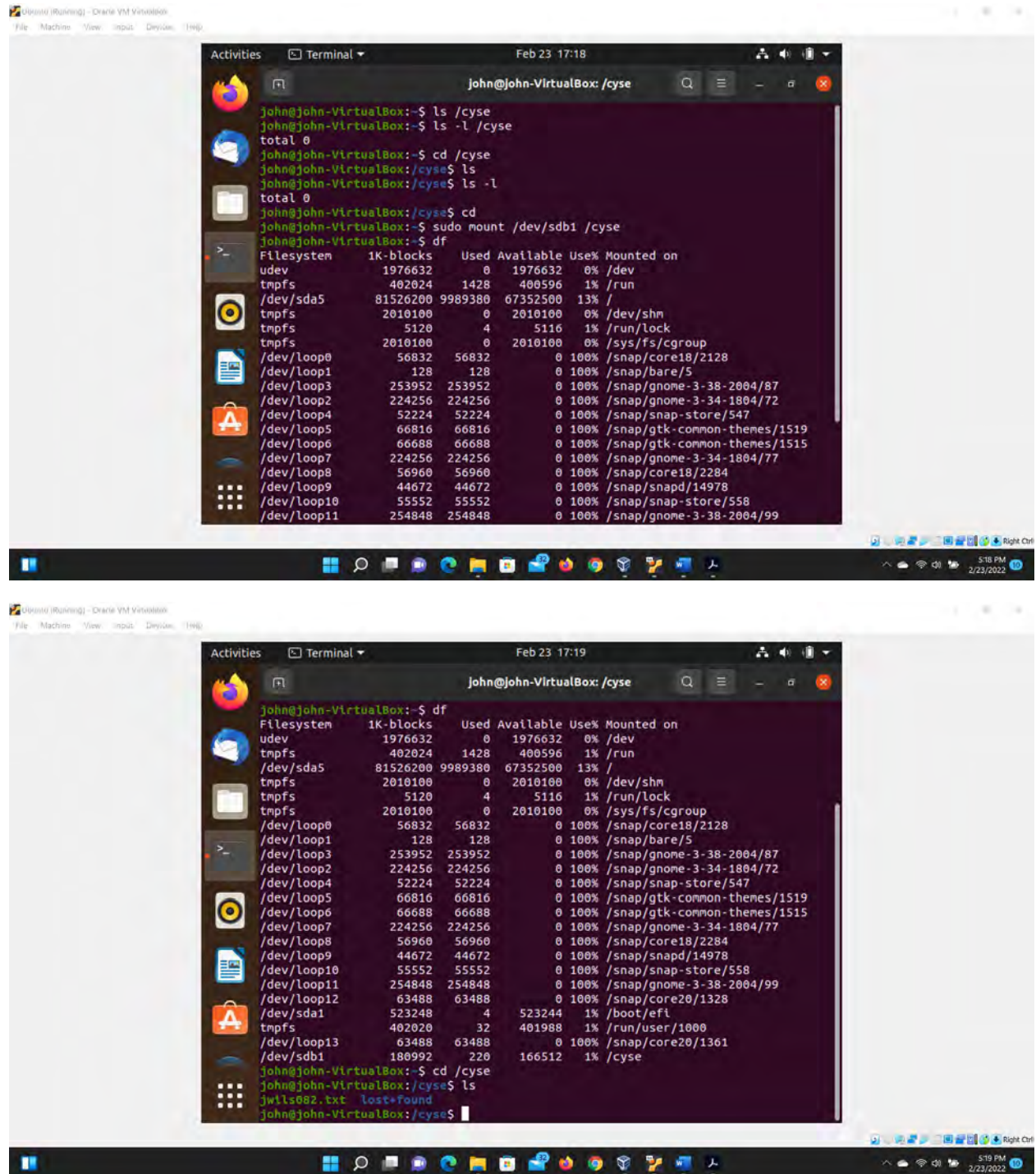


Figure 13 Screenshots of JWILS082 Computer screen for Step 8.

After running the command “ls” I found that no files were located in the directory. However, I mounted /dev/sdb1 to /cyse once again and ran the command “ls” and the files were located in the directory /cyse.