

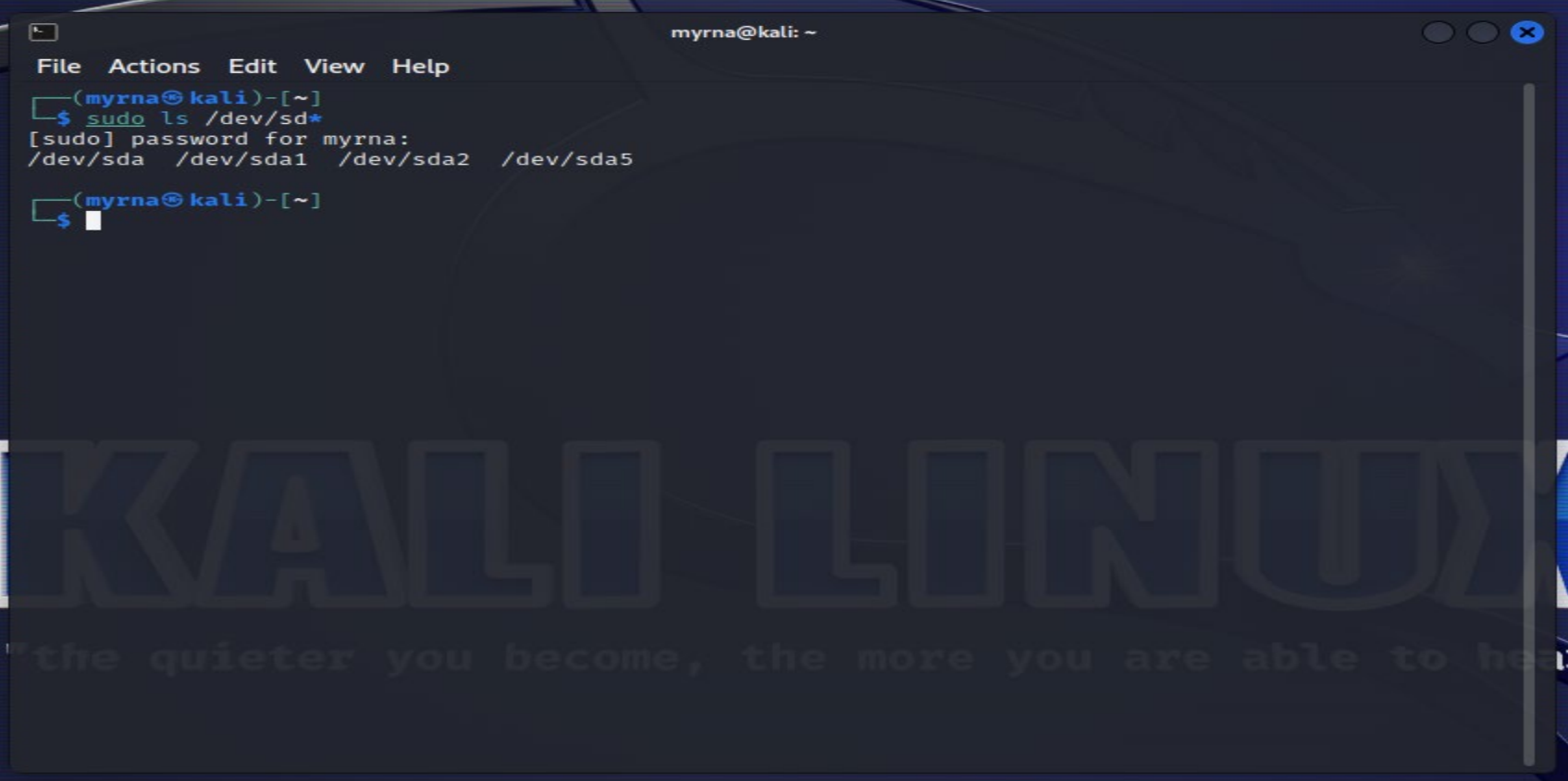
Myrna Santiago

CYSE 270_20306

Assignment 7: Storage Management

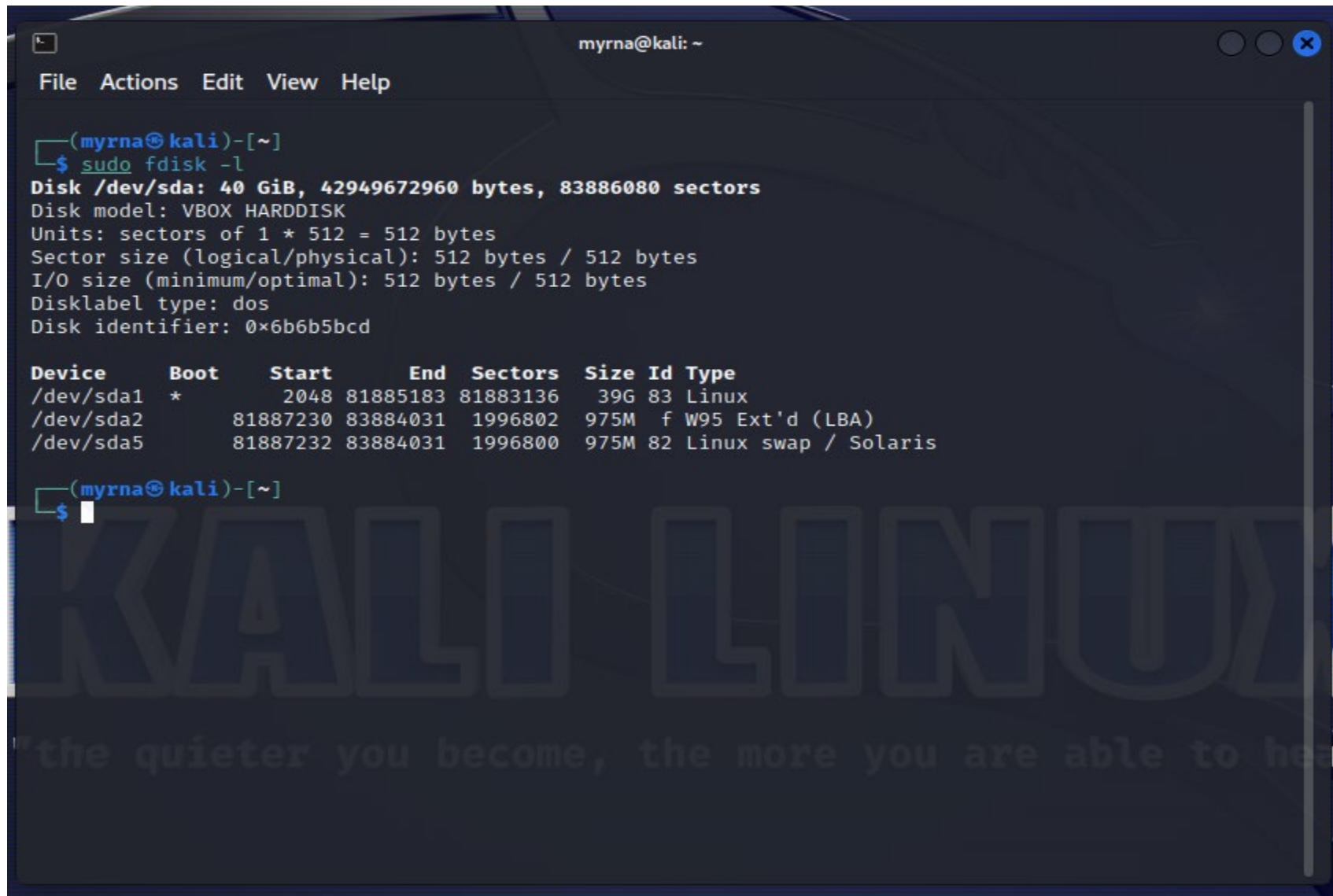
Part I: Check your file system

Step 1: `sudo ls /dev/sd*` shows the available hard disk devices.



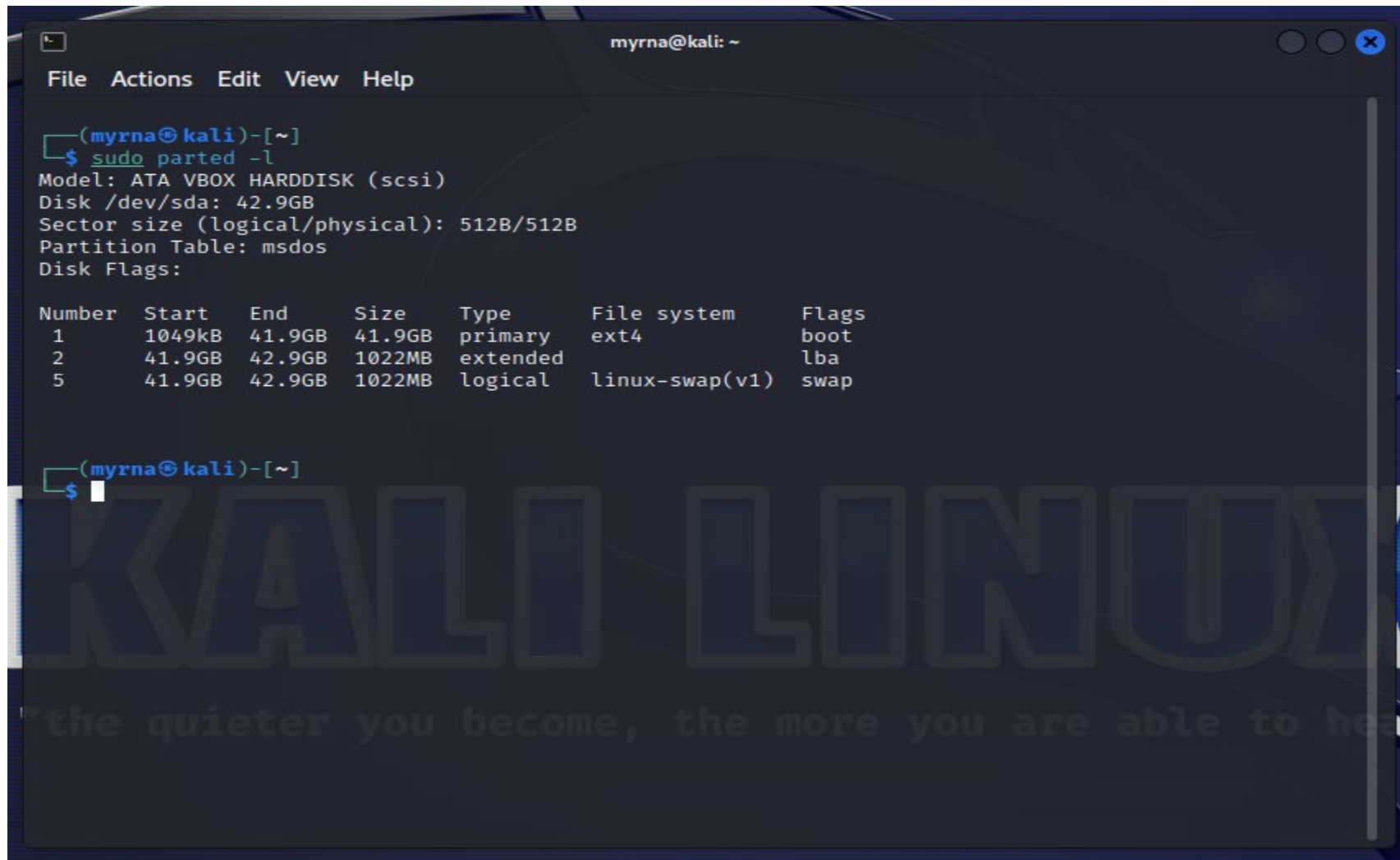
```
myrna@kali: ~  
File Actions Edit View Help  
(myrna@kali)-[~]  
└─$ sudo ls /dev/sd*  
[sudo] password for myrna:  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5  
(myrna@kali)-[~]  
└─$
```

Step 2: `sudo fdisk -l` shows list of current hard disk partitions.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo fdisk -l  
Disk /dev/sda: 40 GiB, 42949672960 bytes, 83886080 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: 0x6b6b5bcd  
  
Device      Boot      Start          End      Sectors      Size Id Type  
/dev/sda1   *          2048      81885183   81883136      39G 83 Linux  
/dev/sda2                   81887230   83884031   1996802      975M  f W95 Ext'd (LBA)  
/dev/sda5                   81887232   83884031   1996800      975M 82 Linux swap / Solaris  
  
(myrna@kali)-[~]  
└─$
```

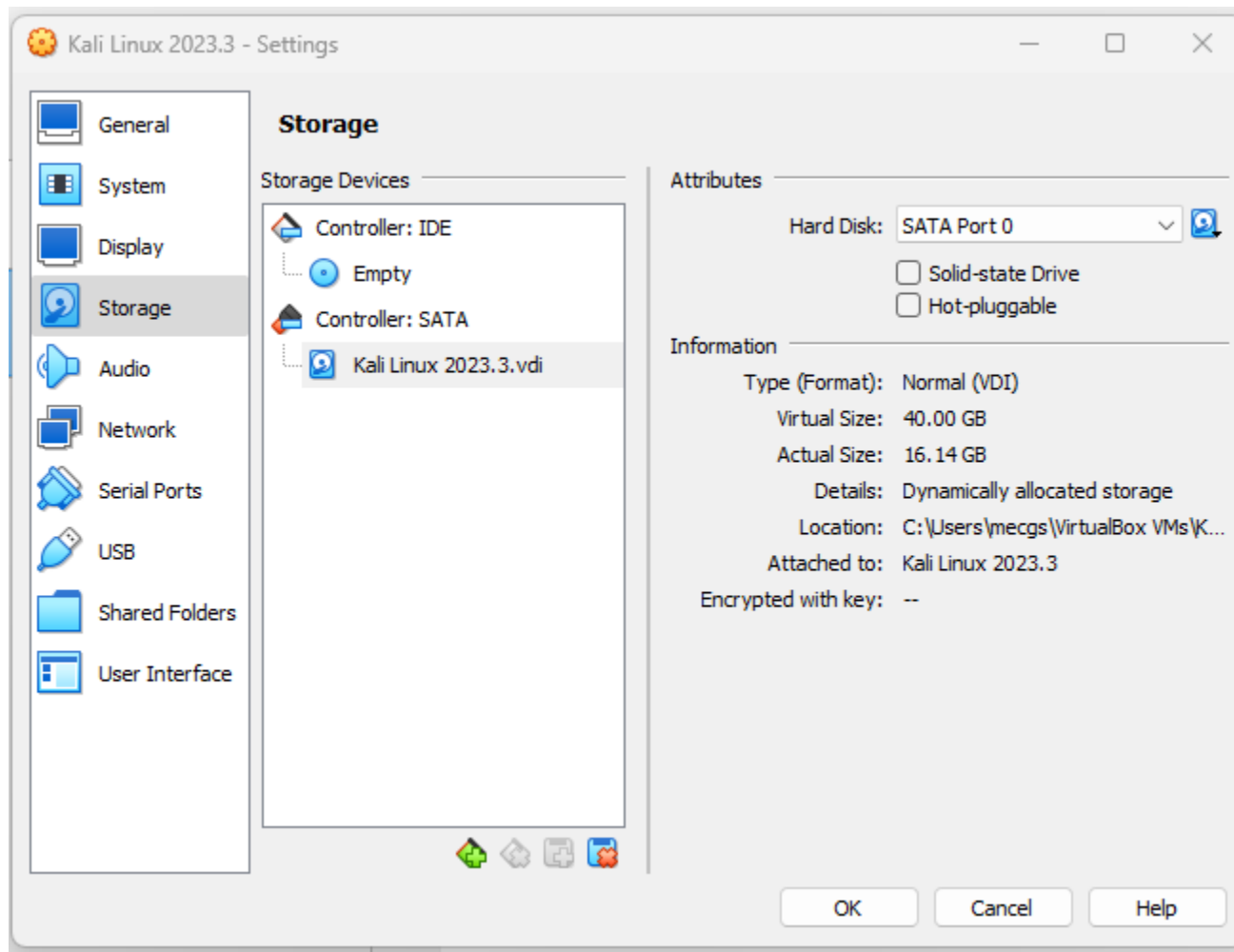
Step 3: `sudo parted -l` shows list of current hard disk partitions table.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo parted -l  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sda: 42.9GB  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  
  
Number  Start   End     Size    Type    File system  Flags  
1       1049kB  41.9GB  41.9GB  primary ext4         boot  
2       41.9GB  42.9GB  1022MB  extended lba  
5       41.9GB  42.9GB  1022MB  logical linux-swap(v1) swap  
  
(myrna@kali)-[~]  
└─$
```

Part II: Create a new virtual disk.

Step 1: A new virtual disk of 200MB was created and named msant023.vdi.



Medium Selector



Add



Create



Refresh

Name	Virtual Size	Actual Size
▼ Attached		
Kali Linux 2023.3.vdi	40.00 GB	16.14 GB
msant023.vdi	200.00 MB	2.00 MB
Ubuntu 22.04.3.vdi	30.00 GB	13.64 GB

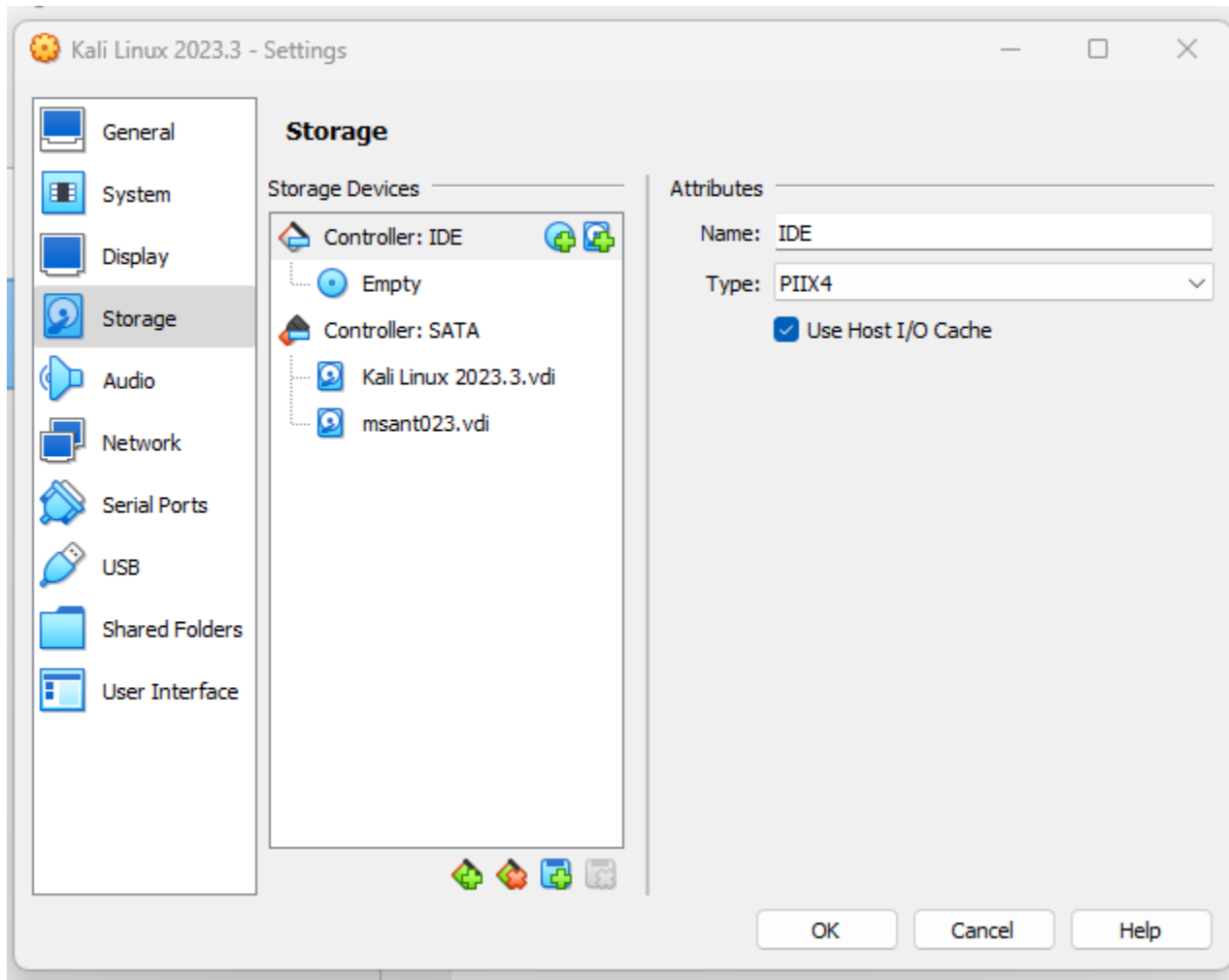
Search By Name



Choose

Cancel

Step 2: Loading virtual hard disk into virtual machine.



myrna@kali: ~

File Actions Edit View Help

(myrna@kali)-[~]

\$ sudo fdisk -l

Disk /dev/sda: 40 GiB, 42949672960 bytes, 83886080 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: 0x6b6b5bcd

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sda1	*	2048	81885183	81883136	39G	83	Linux
/dev/sda2		81887230	83884031	1996802	975M	f	W95 Ext'd (LBA)
/dev/sda5		81887232	83884031	1996800	975M	82	Linux swap / Solaris

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

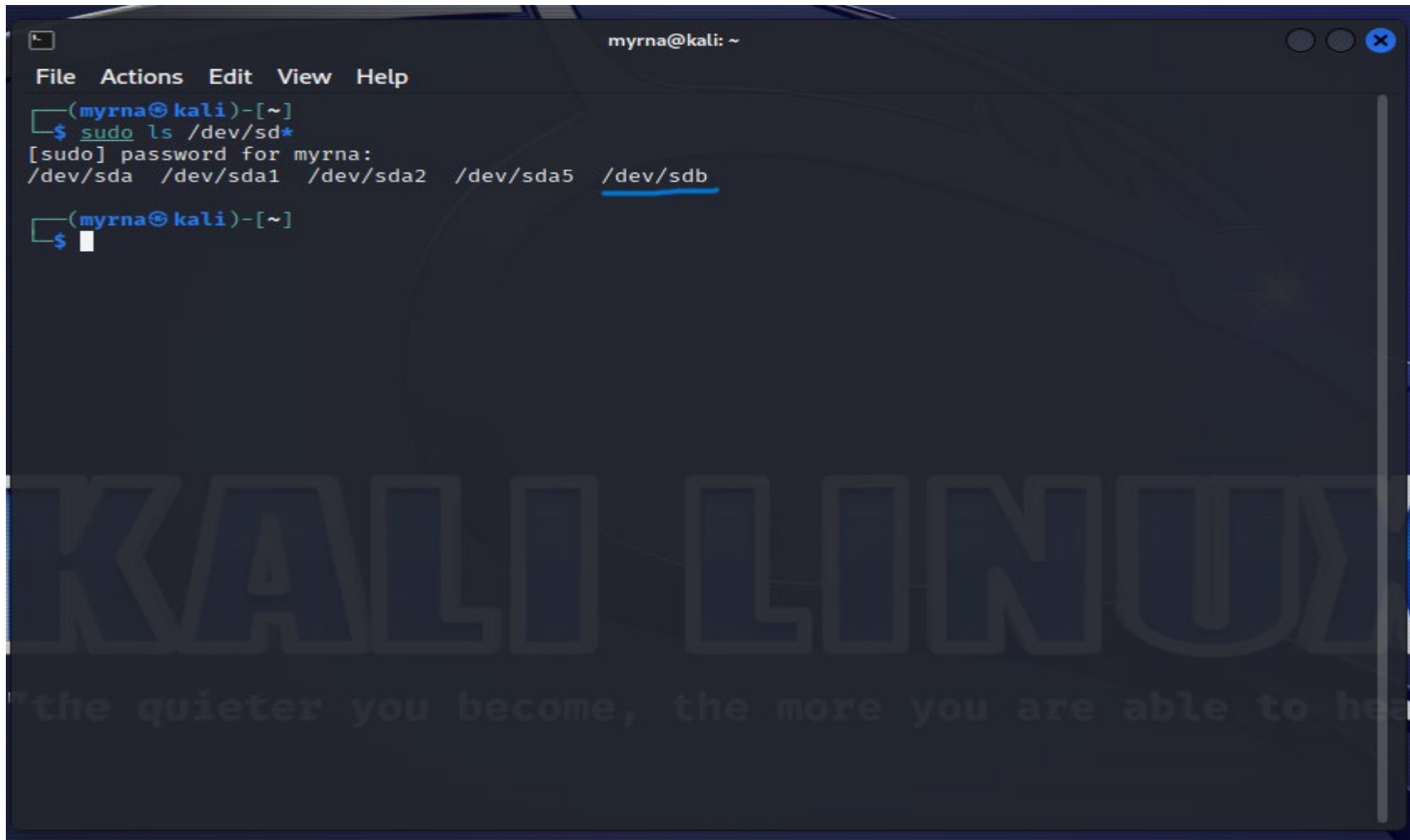
Disk identifier: 0x804d4674

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	409599	407552	199M	83	Linux

(myrna@kali)-[~]

\$

Step 3a: Using `sudo ls /dev/sb*` once more we can see the new hard disk (blue underline).



```
myrna@kali: ~  
File Actions Edit View Help  
[myrna@kali]~  
$ sudo ls /dev/sd*  
[sudo] password for myrna:  
/dev/sda /dev/sda1 /dev/sda2 /dev/sda5 /dev/sdb  
[myrna@kali]~  
$
```

Step 3b: Using `sudo fdisk -l` we can see new disk partitions.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo fdisk -l  
Disk /dev/sda: 40 GiB, 42949672960 bytes, 83886080 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: 0x6b6b5bcd  
  
Device      Boot      Start          End      Sectors      Size Id Type  
/dev/sda1   *          2048      81885183   81883136     39G 83 Linux  
/dev/sda2                   81887230   83884031    1996802     975M  f W95 Ext'd (LBA)  
/dev/sda5                   81887232   83884031    1996800     975M 82 Linux swap / Solaris  
  
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  
  
(myrna@kali)-[~]  
└─$
```

NEW

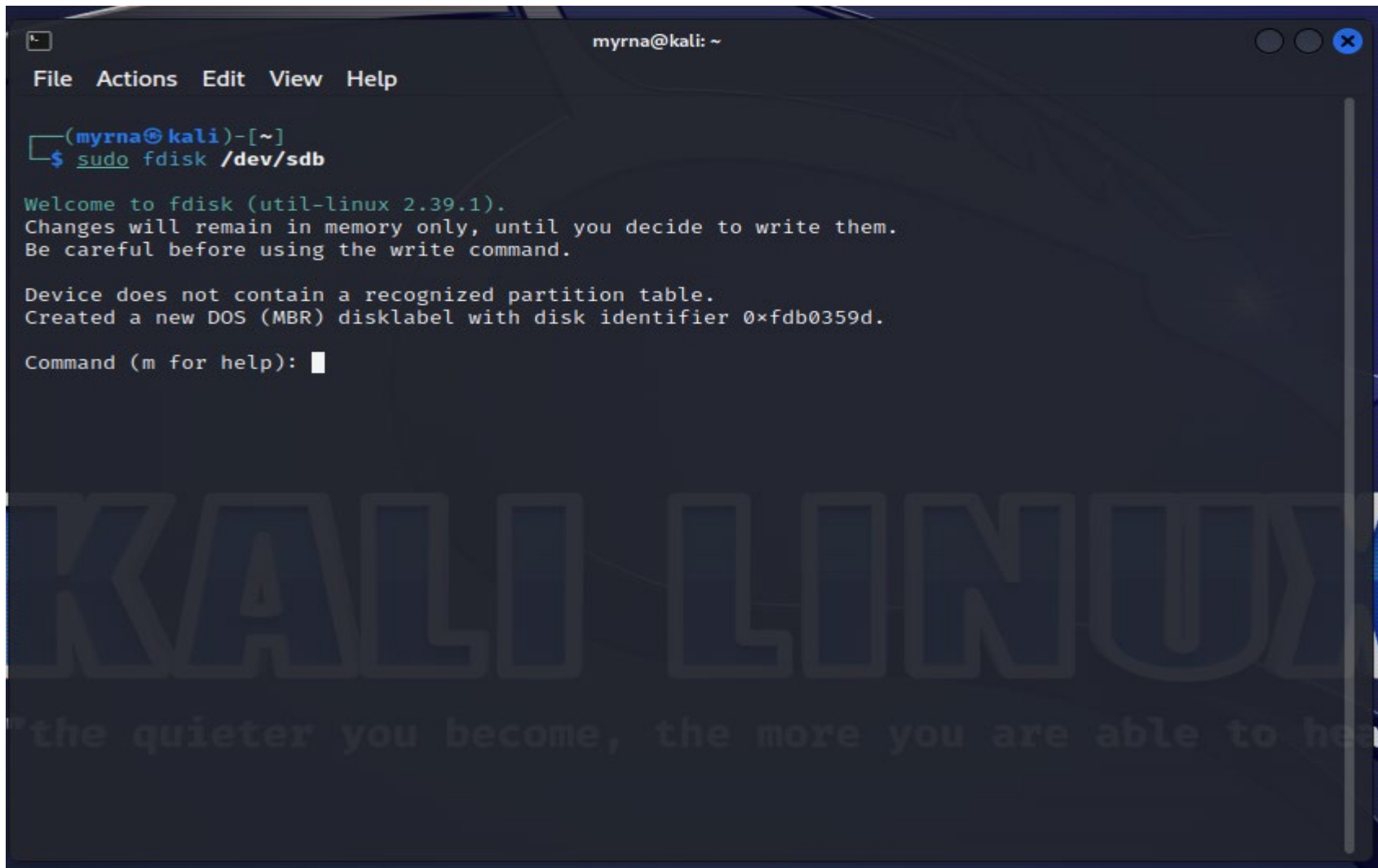
Step 3c: Using **sudo parted -l** we can see the new partition table with an additional label showing an error because the disk label is unknown.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo parted -l  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sda: 42.9GB  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  
  
Number  Start   End     Size    Type     File system  Flags  
1       1049kB  41.9GB  41.9GB  primary  ext4         boot  
2       41.9GB  42.9GB  1022MB  extended lba  
5       41.9GB  42.9GB  1022MB  logical  linux-swap(v1) swap  
  
Error: /dev/sdb: unrecognised disk label  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sdb: 210MB  
Sector size (logical/physical): 512B/512B  
Partition Table: unknown  
Disk Flags:  
  
(myrna@kali)-[~]  
└─$
```

NEW

Part III: Creating Partitions and Filesystems.

Step 1: Using `sudo fdisk /dev/sdb` we create a new primary partition on the new virtual disk.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo fdisk /dev/sdb  
  
Welcome to fdisk (util-linux 2.39.1).  
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 0xfdb0359d.  
  
Command (m for help): █
```

myrna@kali: ~

File Actions Edit View Help

(myrna@kali)-[~]

\$ sudo fdisk -l

Disk /dev/sda: 40 GiB, 42949672960 bytes, 83886080 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: 0x6b6b5bcd

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sda1	*	2048	81885183	81883136	39G	83	Linux
/dev/sda2		81887230	83884031	1996802	975M	f	W95 Ext'd (LBA)
/dev/sda5		81887232	83884031	1996800	975M	82	Linux swap / Solaris

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: 0x804d4674

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	409599	407552	199M	83	Linux

(myrna@kali)-[~]

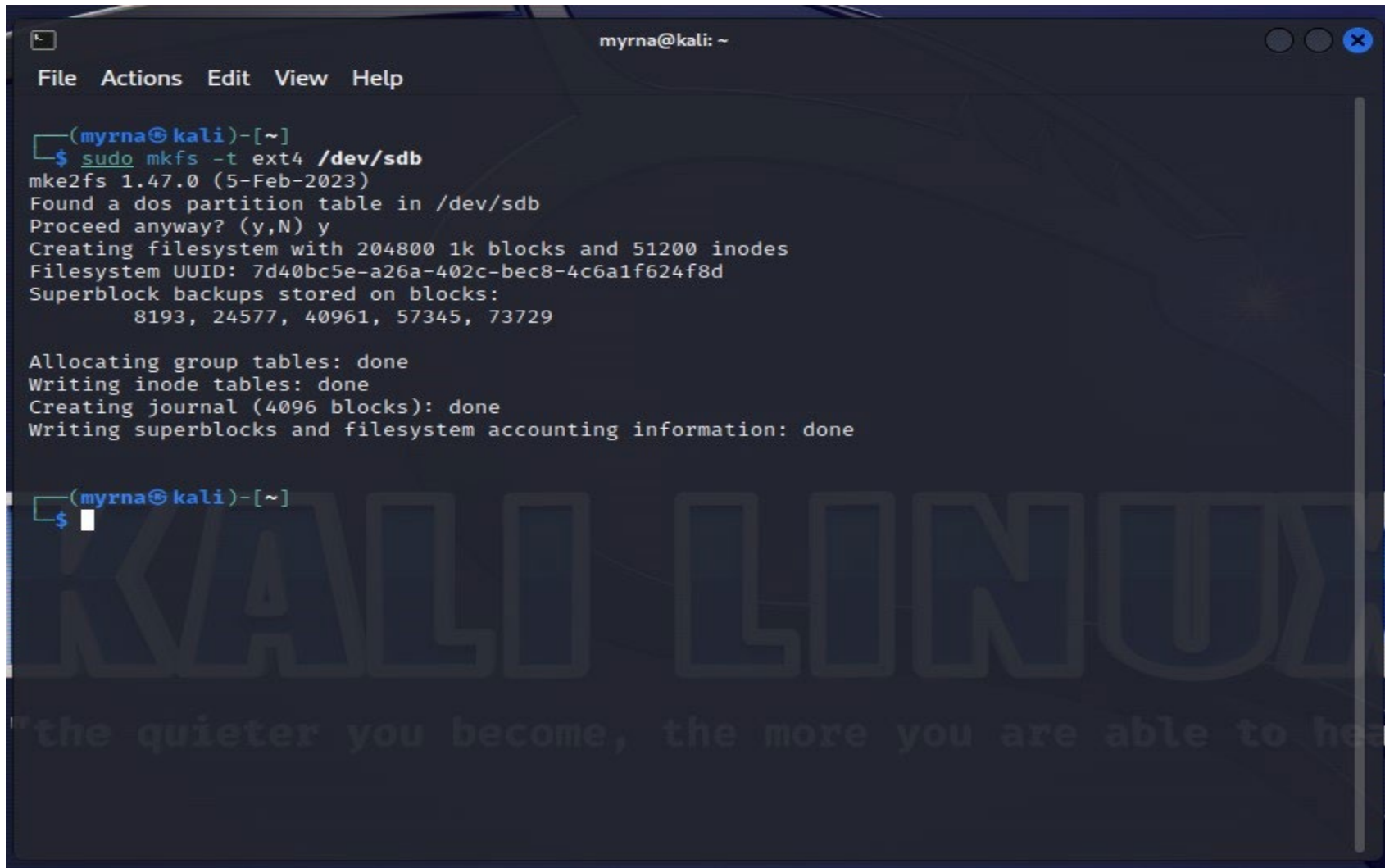
\$

NEW

Step 2a: `sudo parted -l` show the primary partition without defined file system.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo parted -l  
[sudo] password for myrna:  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sda: 42.9GB  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  
  
Number  Start   End     Size   Type   File system  Flags  
1       1049kB  41.9GB  41.9GB primary ext4          boot  
2       41.9GB  42.9GB  1022MB extended                lba  
5       41.9GB  42.9GB  1022MB logical  linux-swap(v1)  swap  
  
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  
  
(myrna@kali)-[~]  
└─$
```

Step 2b: `sudo mkfs -t ext4 /dev/sdb` we create an ext4 filesystem on the new partition.

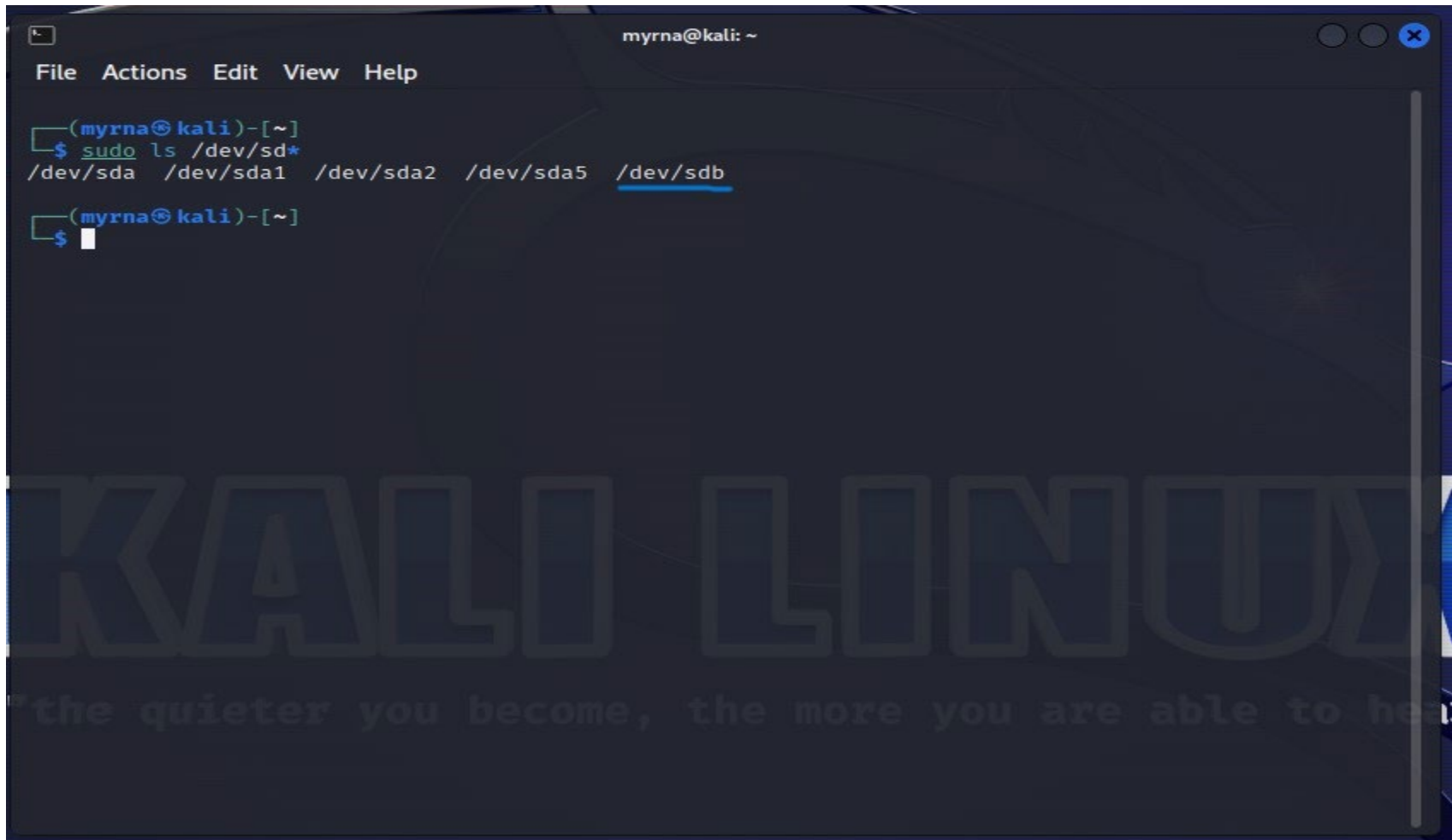


```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo mkfs -t ext4 /dev/sdb  
mke2fs 1.47.0 (5-Feb-2023)  
Found a dos partition table in /dev/sdb  
Proceed anyway? (y,N) y  
Creating filesystem with 204800 1k blocks and 51200 inodes  
Filesystem UUID: 7d40bc5e-a26a-402c-bec8-4c6a1f624f8d  
Superblock backups stored on blocks:  
    8193, 24577, 40961, 57345, 73729  
  
Allocating group tables: done  
Writing inode tables: done  
Creating journal (4096 blocks): done  
Writing superblocks and filesystem accounting information: done  
  
(myrna@kali)-[~]  
└─$
```

Step 2c: Now we can see that the file system is ext4.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo parted -l  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sda: 42.9GB  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  
  
Number  Start   End     Size    Type     File system  Flags  
  1      1049kB  41.9GB  41.9GB  primary  ext4         boot  
  2      41.9GB  42.9GB  1022MB  extended lba  
  5      41.9GB  42.9GB  1022MB  logical  linux-swap(v1) swap  
  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sdb: 210MB  
Sector size (logical/physical): 512B/512B  
Partition Table: loop  
Disk Flags:  
  
Number  Start   End     Size    File system  Flags  
  1      0.00B  210MB  210MB  ext4  
  
(myrna@kali)-[~]  
└─$
```


Step 3a: We can see that the new disk is still shown.

A terminal window titled "myrna@kali: ~" with a menu bar containing "File", "Actions", "Edit", "View", and "Help". The terminal shows a command prompt "(myrna@kali)-[~]" followed by the command "\$ sudo ls /dev/sd*". The output is a list of disk paths: "/dev/sda", "/dev/sda1", "/dev/sda2", "/dev/sda5", and "/dev/sdb". The path "/dev/sdb" is underlined. Below the output, the prompt "(myrna@kali)-[~]" is shown again with a "\$" and a cursor.

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

Step 3b: The new hard disk partitions is still shown.

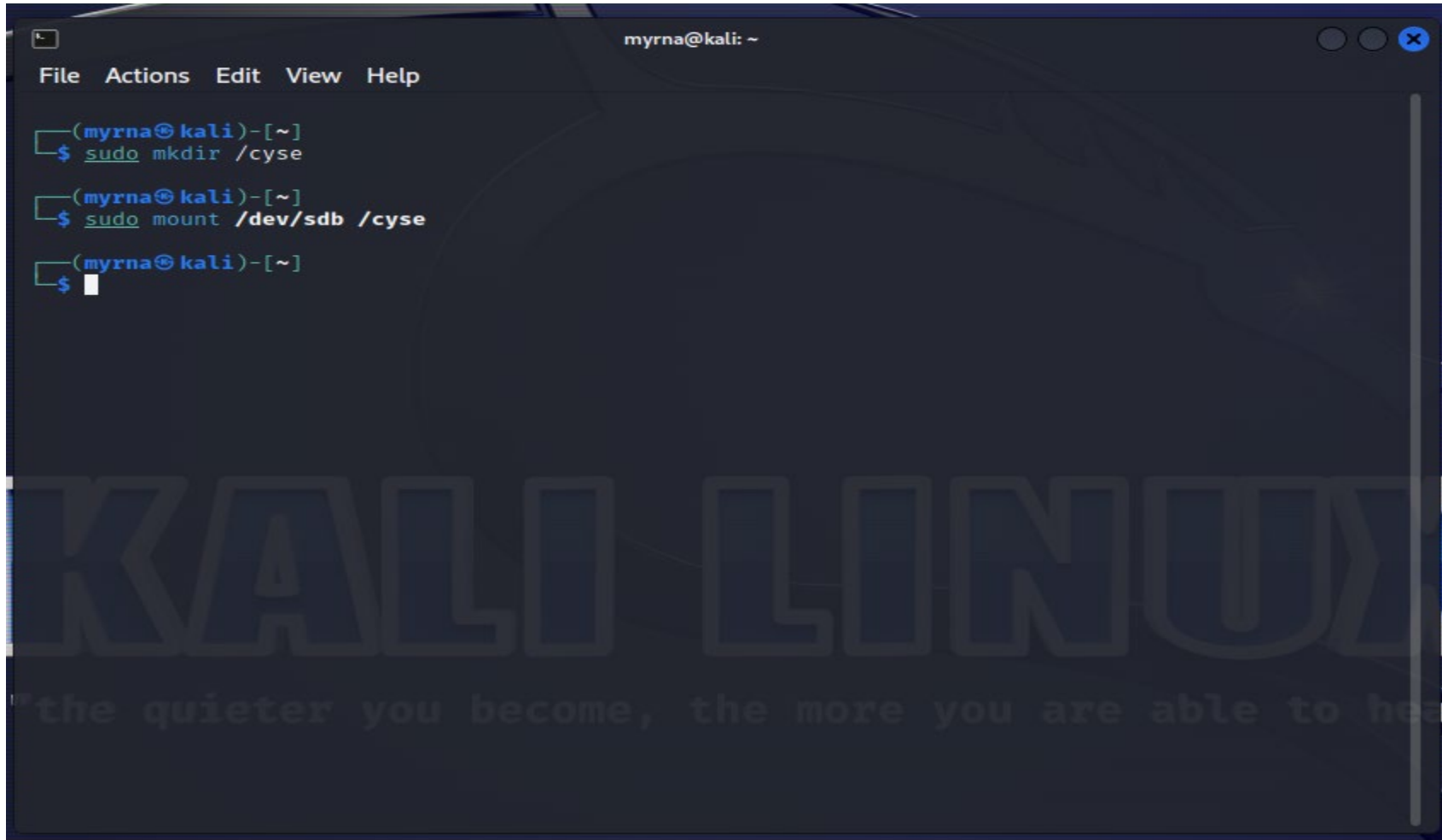
```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo fdisk -l  
Disk /dev/sda: 40 GiB, 42949672960 bytes, 83886080 sectors  
Disk model: VBOX HARDDISK  
Units: sectors of 1 * 512 = 512 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disklabel type: dos  
Disk identifier: 0x6b6b5bcd  
  
Device      Boot      Start          End      Sectors      Size Id Type  
/dev/sda1   *          2048      81885183   81883136     39G 83 Linux  
/dev/sda2                   81887230   83884031   1996802      975M  f W95 Ext'd (LBA)  
/dev/sda5                   81887232   83884031   1996800      975M 82 Linux swap / Solaris  
  
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  
  
(myrna@kali)-[~]  
└─$
```



Step 3c: Using `sudo parted -l` we see our hard disk partition table with the ext4 file system.

```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo parted -l  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sda: 42.9GB  
Sector size (logical/physical): 512B/512B  
Partition Table: msdos  
Disk Flags:  
  
Number  Start   End     Size    Type     File system  Flags  
  1      1049kB  41.9GB  41.9GB  primary  ext4         boot  
  2      41.9GB  42.9GB  1022MB  extended lba  
  5      41.9GB  42.9GB  1022MB  logical  linux-swap(v1) swap  
  
Model: ATA VBOX HARDDISK (scsi)  
Disk /dev/sdb: 210MB  
Sector size (logical/physical): 512B/512B  
Partition Table: loop  
Disk Flags:  
  
Number  Start   End     Size    File system  Flags  
  1      0.00B   210MB   210MB   ext4  
  
(myrna@kali)-[~]  
└─$
```

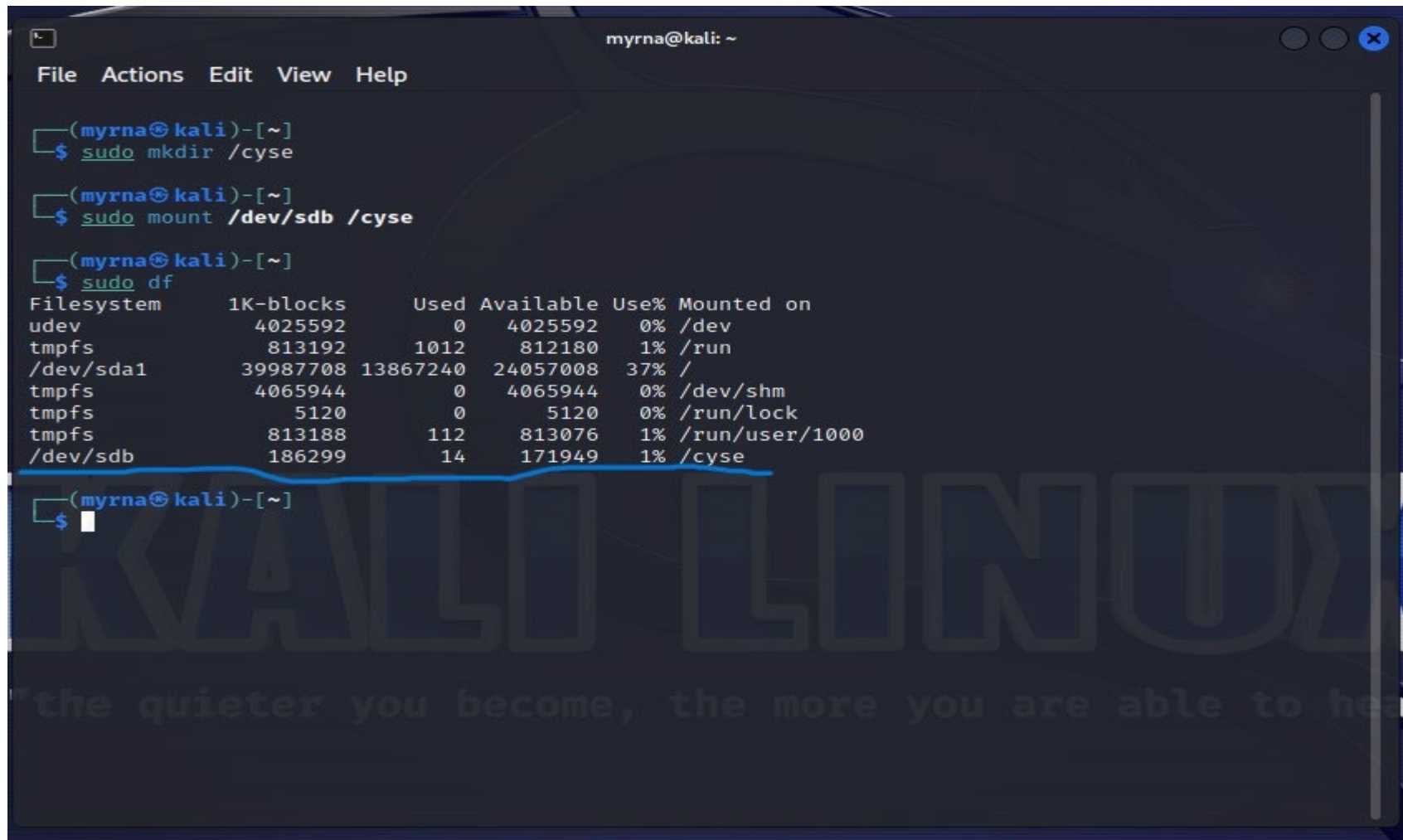
Step 4: Using `sudo mkdir /cyse` we created a directory named cyse. Using `sudo mount /dev/sdb /cyse` we mounted our hard disk to the cyse directory.

A terminal window titled 'myrna@kali: ~' with a menu bar containing 'File', 'Actions', 'Edit', 'View', and 'Help'. The terminal shows three lines of command execution:

```
(myrna@kali)-[~]  
└─$ sudo mkdir /cyse  
  
(myrna@kali)-[~]  
└─$ sudo mount /dev/sdb /cyse  
  
(myrna@kali)-[~]  
└─$
```

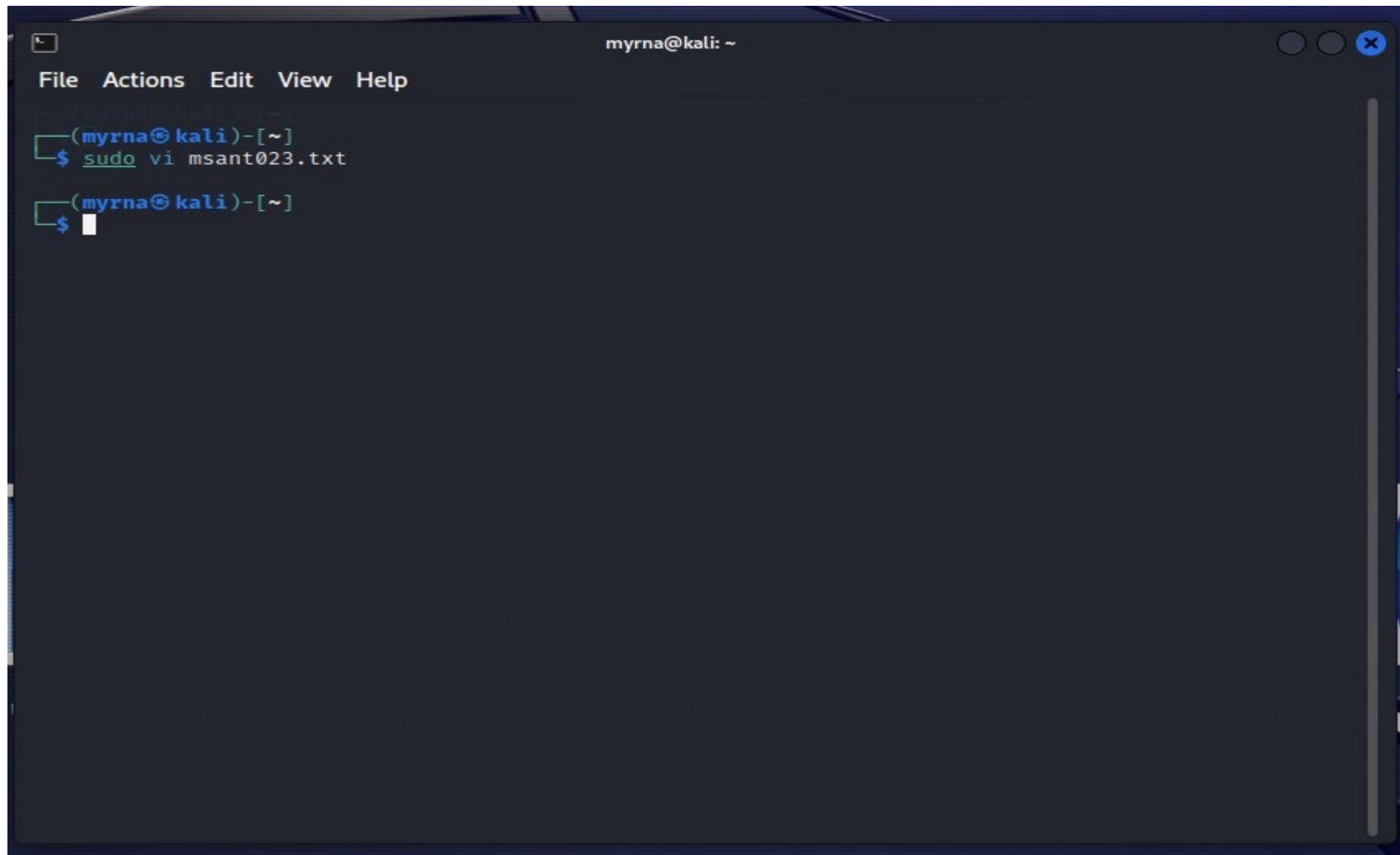
The terminal background features a large, semi-transparent watermark that reads 'KALI LINUX' and a quote: 'the quieter you become, the more you are able to hear'.

Step 5: `sudo df` shows that the filesystem created in `/dev/sdb` is mounted on `/cyse`.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo mkdir /cyse  
  
(myrna@kali)-[~]  
└─$ sudo mount /dev/sdb /cyse  
  
(myrna@kali)-[~]  
└─$ sudo df  
Filesystem      1K-blocks      Used Available Use% Mounted on  
udev            4025592         0   4025592   0% /dev  
tmpfs           813192         1012    812180   1% /run  
/dev/sda1       39987708 13867240 24057008 37% /  
tmpfs           4065944         0   4065944   0% /dev/shm  
tmpfs            5120           0     5120    0% /run/lock  
tmpfs           813188         112    813076   1% /run/user/1000  
/dev/sdb        186299         14    171949   1% /cyse  
  
(myrna@kali)-[~]  
└─$
```

Step 6a: Using `sudo vi msant023.txt` we created a text file.



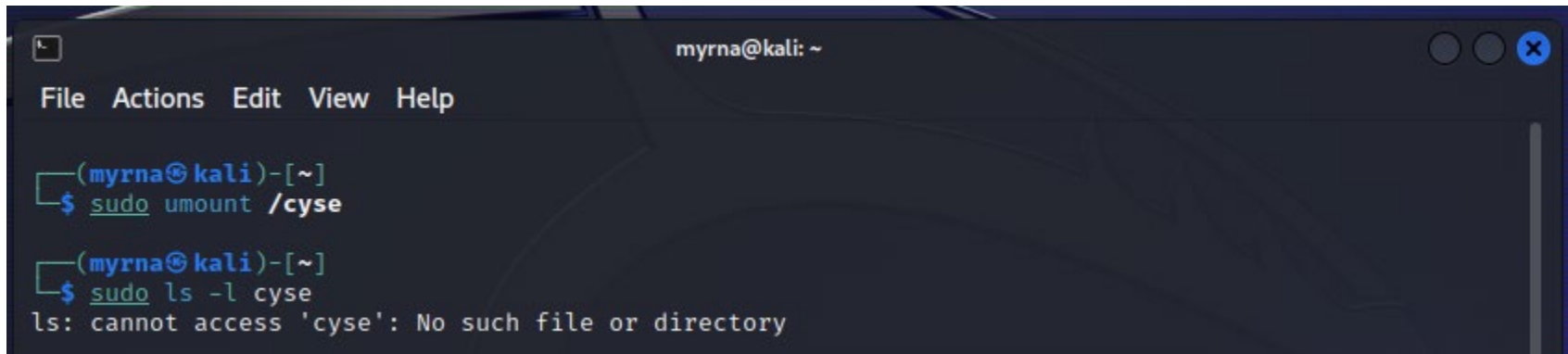
```
myrna@kali: ~  
File Actions Edit View Help  
myrna@kali: ~  
└─$ sudo vi msant023.txt  
myrna@kali: ~  
└─$
```

And wrote Myrna E Santiago inside it.



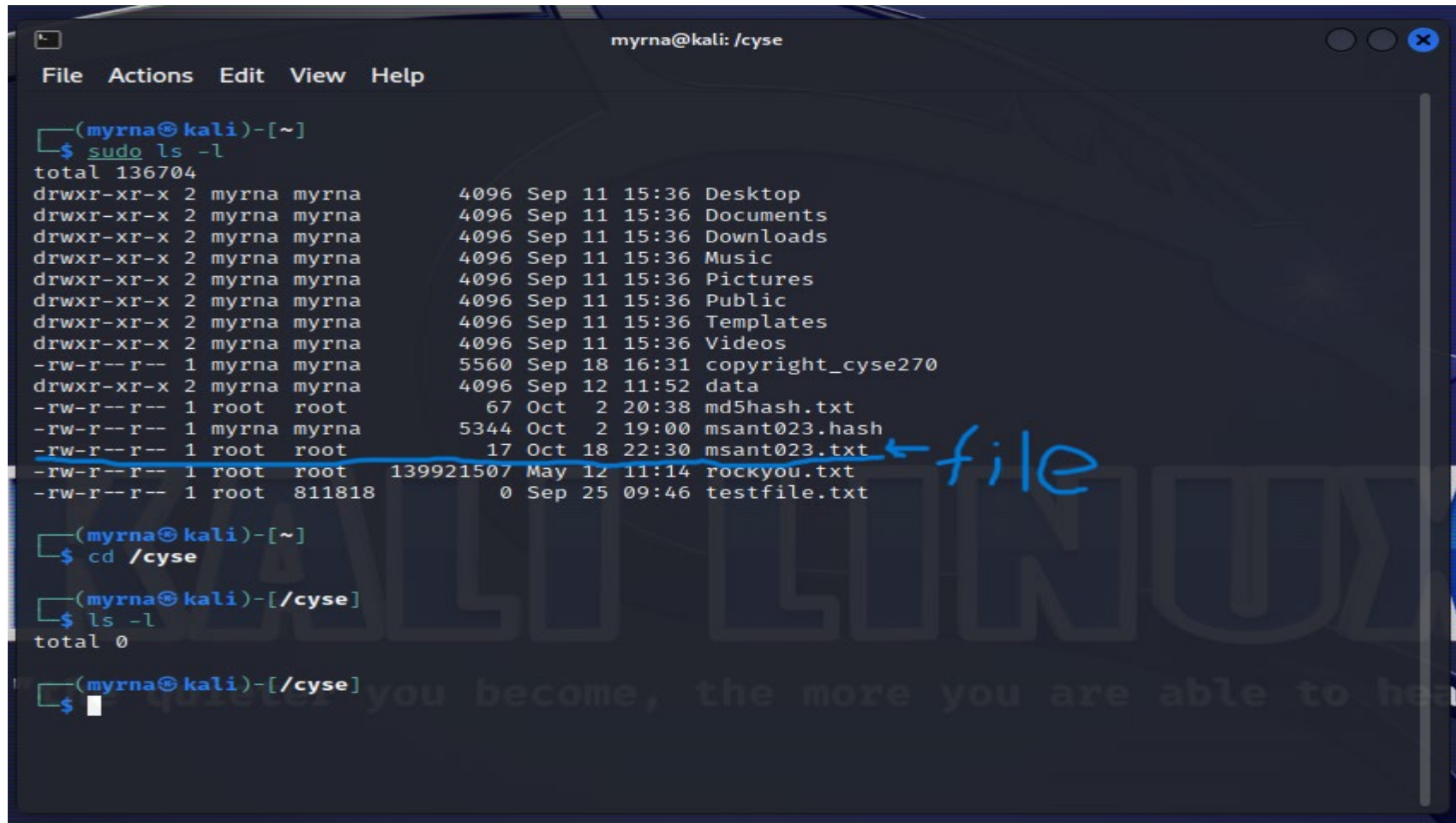
The image shows a dark-themed text editor window. The title bar at the top reads "myrna@kali: ~". The menu bar includes "File", "Actions", "Edit", "View", and "Help". The main text area contains the name "Myrna E Santiago" on the first line, followed by several lines of blue wavy lines representing a scroll bar. At the bottom left, the status bar shows the filename and size: "\"msant023.txt\" 1L, 17B". At the bottom right, it shows the cursor position "1,11" and the word "All". A large, semi-transparent watermark "KALI LINUX" is visible across the center of the window, and a faint quote "the quieter you become, the more you are able to hear" is visible at the bottom.

Step 7: Using `sudo umount /cyse` we unmounted the directory and proved that is not there anymore using `sudo ls -l cyse`.



```
myrna@kali: ~  
File Actions Edit View Help  
  
(myrna@kali)-[~]  
└─$ sudo umount /cyse  
  
(myrna@kali)-[~]  
└─$ sudo ls -l cyse  
ls: cannot access 'cyse': No such file or directory
```

Step 8: Cyse directory is empty and our file is in the home directory now.



The image shows a terminal window titled "myrna@kali: /cyse". The terminal output is as follows:

```
(myrna@kali)-[~]
└─$ sudo ls -l
total 136704
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Desktop
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Documents
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Downloads
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Music
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Pictures
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Public
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Templates
drwxr-xr-x 2 myrna myrna      4096 Sep 11 15:36 Videos
-rw-r--r-- 1 myrna myrna      5560 Sep 18 16:31 copyright_cyse270
drwxr-xr-x 2 myrna myrna      4096 Sep 12 11:52 data
-rw-r--r-- 1 root  root         67 Oct  2 20:38 md5hash.txt
-rw-r--r-- 1 myrna myrna      5344 Oct  2 19:00 msant023.hash
-rw-r--r-- 1 root  root         17 Oct 18 22:30 msant023.txt ← file
-rw-r--r-- 1 root  root    139921507 May 12 11:14 rockyou.txt
-rw-r--r-- 1 root  811818         0 Sep 25 09:46 testfile.txt

(myrna@kali)-[~]
└─$ cd /cyse

(myrna@kali)-[/cyse]
└─$ ls -l
total 0

(myrna@kali)-[/cyse]
└─$
```

A blue horizontal line is drawn under the line containing "msant023.txt". A blue arrow points from the handwritten word "file" to this line.