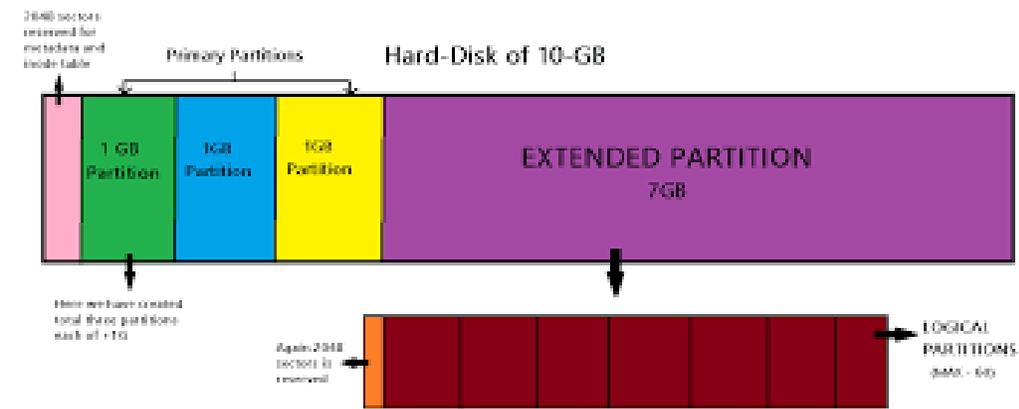
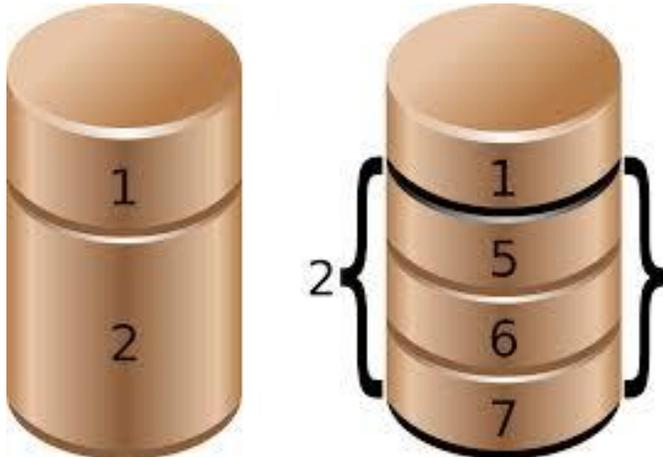
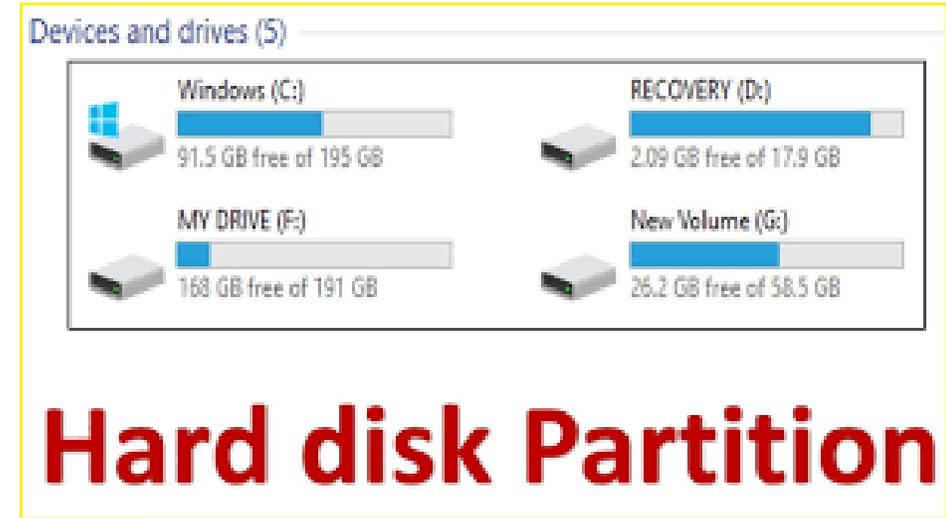


# Lecture 7

**CREATE PARTITIONS**

# Hard disk partitions

- **Disk Partitioning** is the process of dividing a **disk** into one or more logical areas, often known as **partitions**, on which the user can work separately



# Hard disk partitions

There are two types of hard disk

1. HDD (hard disk drive)
2. SSD (solid state drive)

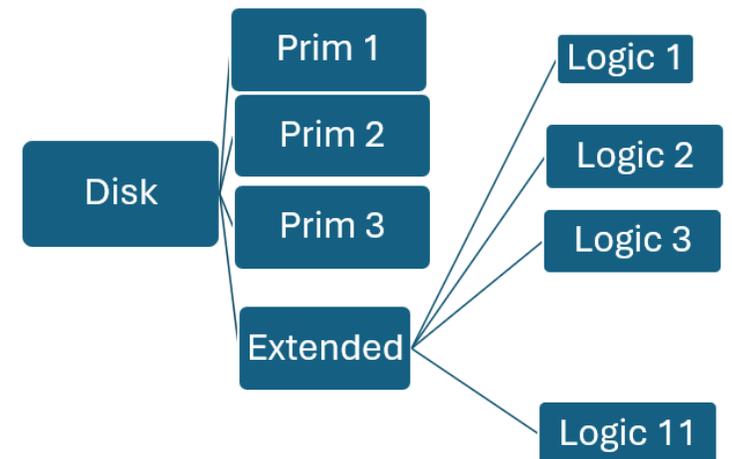
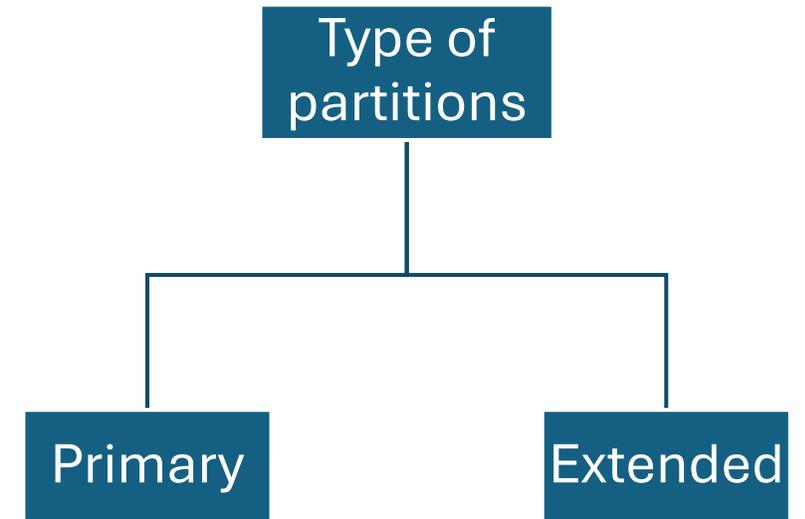


HDD	SDD
Best for long term storage	Best for low latency applications
Uses mechanical parts like spinning disks	Uses flash memory cells without moving parts
Low cost	High cost
Massive capacity	Great for rapid boot times and fast file access

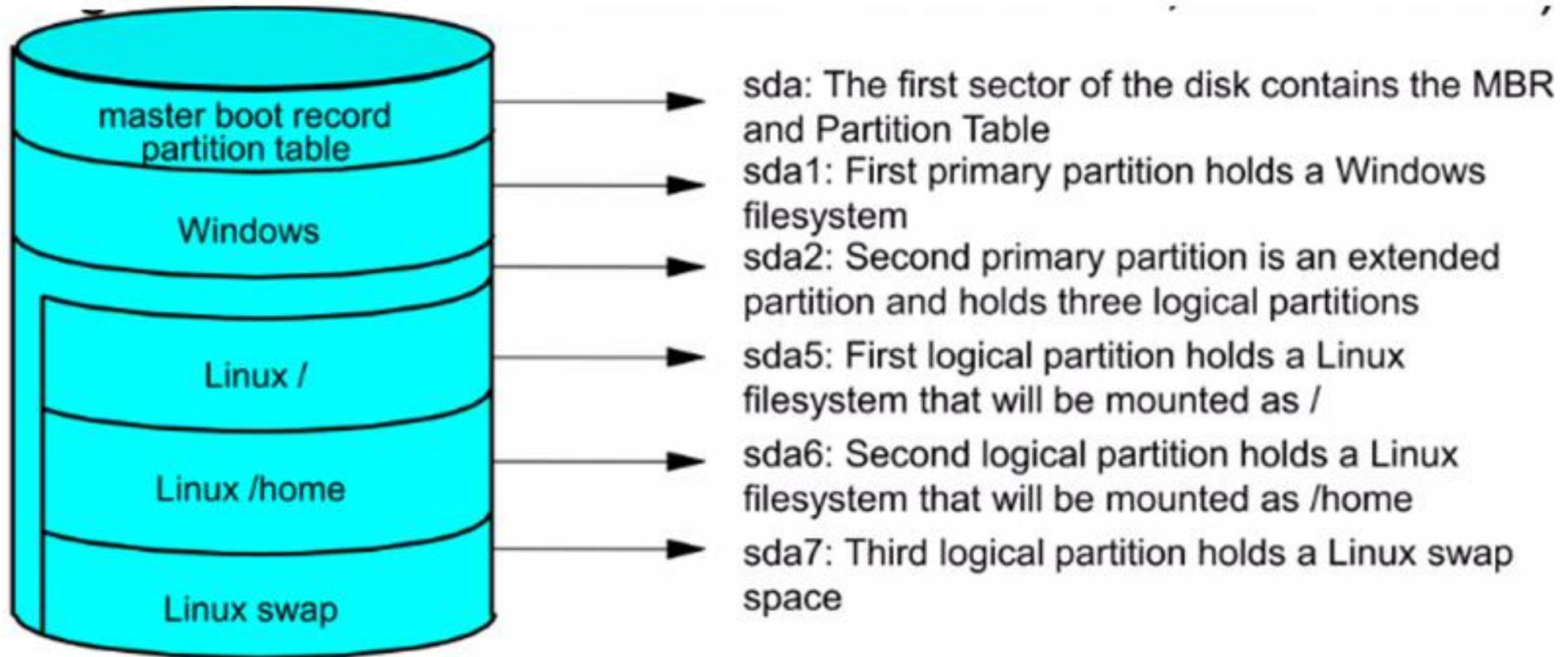
# Hard disk partitions

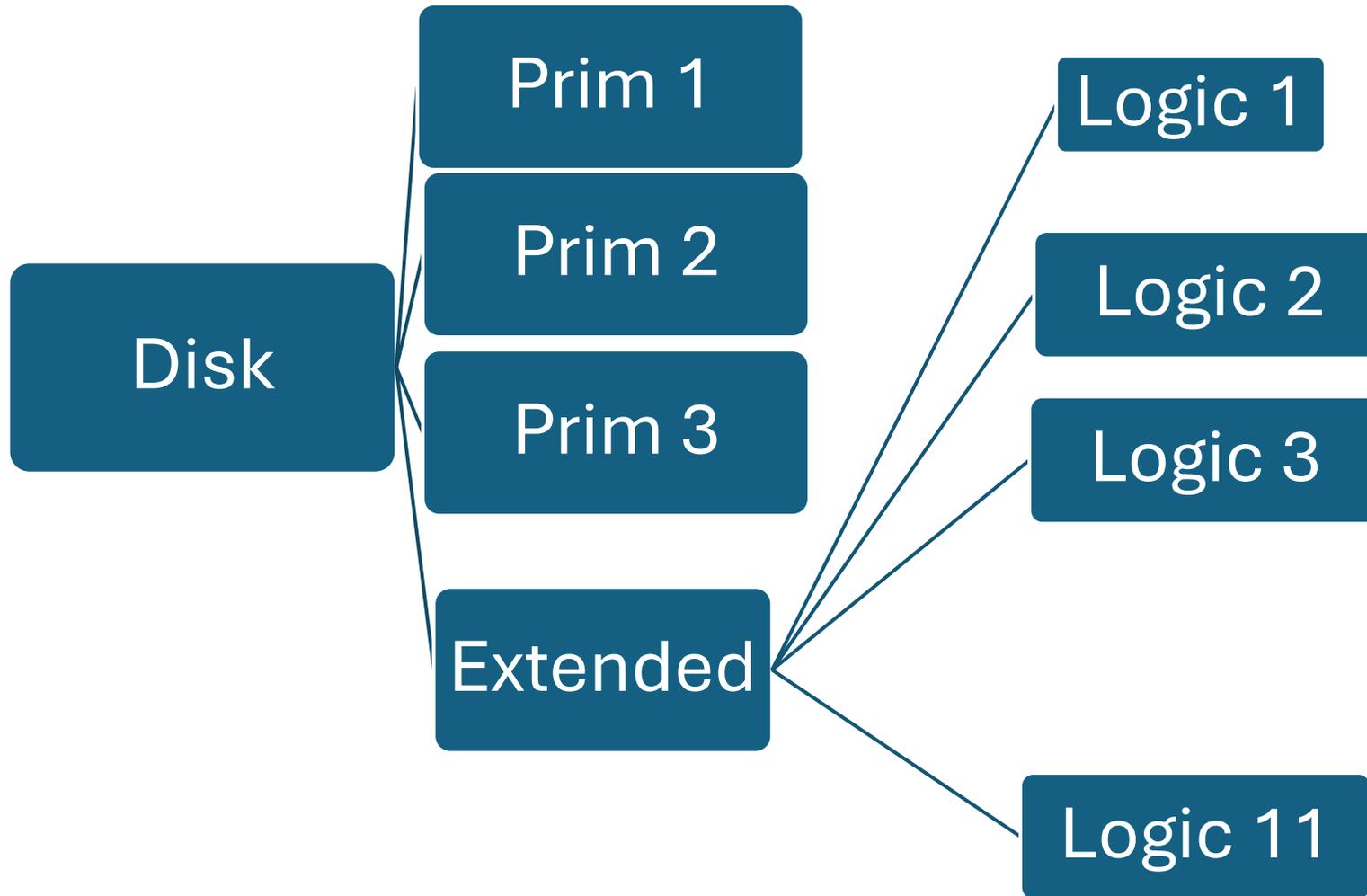
1. Hard disks can be partitioned (or divided)
2. There are maximum number of partitions is **four partitions**.
3. If we want more than 4 partitions we can use extended partition

(it is mean divide one of primary partition to number of extended partitions 59 for IDE and 11 for SCSI)



# Example for partition the disk





**The method to make the  
partitions**

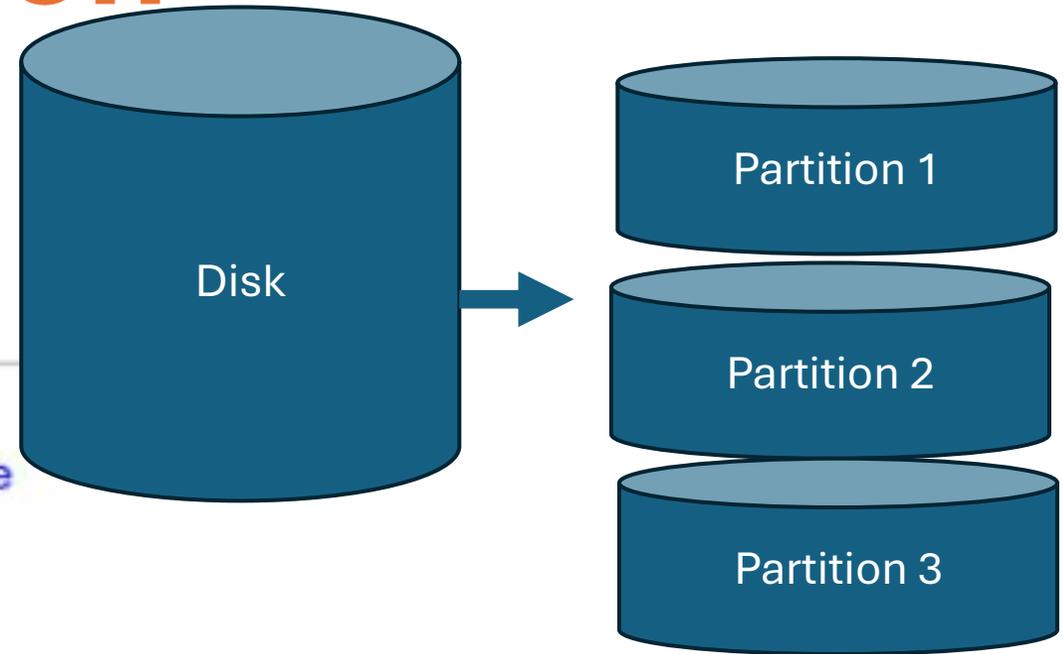
# Steps for creating and using partitions in linux

- Step 1: creating partition (divide the disk into logical parts each part called partition)
- Step2: formatting partition
- Step3: mounting partition

# Step 1: Create partition

## Partitioning tools

- **fdisk**
  - Virtually every PC OS comes with a tool **fdisk** to create partitions for that OS
    - Linux, Windows, and so forth
- **parted**
  - GPLed Linux program, available at [www.gnu.org](http://www.gnu.org)
  - Can create/resize/move/delete partitions
- GParted, QTParted
  - GUI utilities that use GNU Parted
  - Can create/resize/move/delete partitions
- Disk Druid and others
  - Partitioning program integrated in Linux install program



# • Fdisk

- Used in CLI

1. Fdisk -l → List partition table

## Partition table contains

- sda (sda1, sda2,sda3), sdb ,sdc, .....

- Where:

sda, sdb, sdc are disks

sda1,sda2 are partitions in disc sda



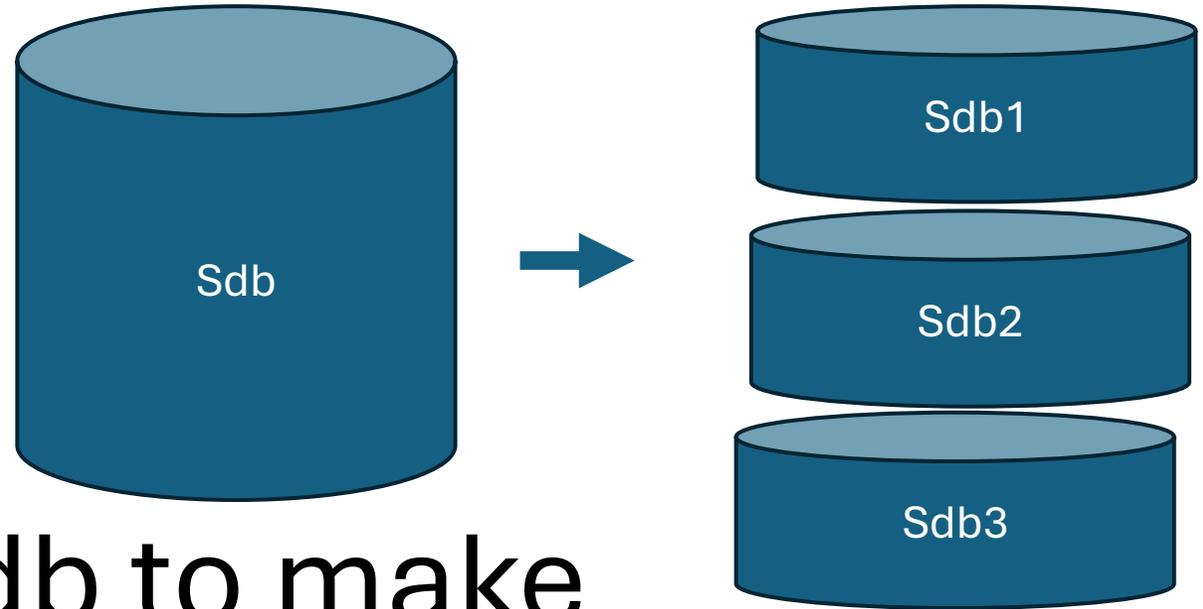


هذا الامر لاستعراض  
جدول ال  
partitions

```
root@localhost:~  
File Edit View Search Terminal Help  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x00038d45  
  
Device Boot      Start          End      Blocks      Id System  
/dev/sda1 *        1            1306     10484736    83 Linux  
/dev/sda2          1306         1959      5242880    82 Linux swap / Solaris  
  
Disk /dev/sdb: 8589 MB, 8589934592 bytes  
255 heads, 63 sectors/track, 1044 cylinders  
Units = cylinders of 16065 * 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x00000000  
  
Disk /dev/sdb doesn't contain a valid partition table  
  
Disk /dev/sdc: 8589 MB, 8589934592 bytes  
255 heads, 63 sectors/track, 1044 cylinders  
Units = cylinders of 16065 * 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x000eedf4
```

اظهر هناك مجموعه  
من disks  
Sda, sdb, sdc

2. `Fdisk /dev/sdb`



To enter into disk sdb to make partitions

root@localhost:~

File Edit View Search Terminal Help

Disk identifier: 0x00000000

Disk /dev/sdb doesn't contain a valid partition table

Disk **/dev/sdc**: 8589 MB, 8589934592 bytes  
255 heads, 63 sectors/track, 1044 cylinders  
Units = cylinders of 16065 \* 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x000eedf4

Device	Boot	Start	End	Blocks	Id	System
--------	------	-------	-----	--------	----	--------



```
[root@localhost ~]# fdisk /dev/sdb
Device contains neither a valid DOS partition table, nor Sun, SGI or OSF disklabel
Building a new DOS disklabel with disk identifier 0x686f4180.
Changes will remain in memory only, until you decide to write them.
After that, of course, the previous content won't be recoverable.

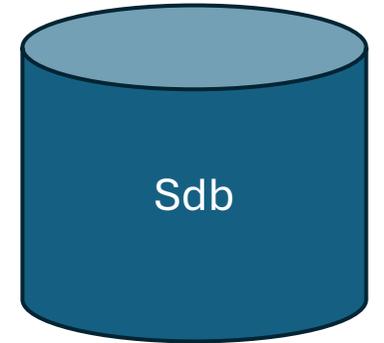
Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to
switch off the mode (command 'c') and change display units to
sectors (command 'u').
```

Command (m for help): █

# Different commands inside window such as

- m → help
- List all commands can be used in this window to make partitions in sdb disk



File Edit View Search Terminal Help

Warning: invalid flag 0x0000 of partition table 4 will be corrected by w(rite)

WARNING: DOS-compatible mode is deprecated. It's strongly recommended to switch off the mode (command 'c') and change display units to sectors (command 'u').

Command (m for help): m

Command action

- a toggle a bootable flag
- b edit bsd disklabel
- c toggle the dos compatibility flag
- d delete a partition
- l list known partition types
- m print this menu
- n add a new partition
- o create a new empty DOS partition table
- p print the partition table
- q quit without saving changes
- s create a new empty Sun disklabel
- t change a partition's system id
- u change display/entry units
- v verify the partition table
- w write table to disk and exit
- x extra functionality (experts only)

ضغط m ,  
يعرض كل الاوامر المتاحة  
داخل الdisk

Command (m for help):

- p → print partition table

لاستعراض جدول  
ال partitions بداخل  
ال sdb  
وجدنا انه لا يوجد اي  
partitions

File Edit View Search Terminal Help

d delete a partition  
l list known partition types  
m print this menu  
n add a new partition  
o create a new empty DOS partition table  
p print the partition table  
q quit without saving changes  
s create a new empty Sun disklabel  
t change a partition's system id  
u change display/entry units  
v verify the partition table  
w write table to disk and exit  
x extra functionality (experts only)

Command (m for help): p

Disk /dev/sdb: 8589 MB, 8589934592 bytes  
255 heads, 63 sectors/track, 1044 cylinders  
Units = cylinders of 16065 \* 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x686f4180

Device	Boot	Start	End	Blocks	Id	System
--------	------	-------	-----	--------	----	--------

Command (m for help):

- n → add a new partition

لانشاء partition جديد

حرف n

يعطيني خيارات اما اختار

Primary

extended

عند اختيار حرف p ده معناها ان الاختيار هو

primary

Partition number دليل علي رقمه علي الديسك

سؤال انه يكون في الاول اضغط enter

سؤال المساحة اكتب 2GB

او 2048M

root@localhost:~

File Edit View Search Terminal Help

```
o create a new empty DOS partition table
p print the partition table
q quit without saving changes
s create a new empty Sun disklabel
t change a partition's system id
u change display/entry units
v verify the partition table
w write table to disk and exit
x extra functionality (experts only)
```

Command (m for help): p

```
Disk /dev/sdb: 8589 MB, 8589934592 bytes
255 heads, 63 sectors/track, 1044 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x686f4180
```

Device	Boot	Start	End	Blocks	Id	System
--------	------	-------	-----	--------	----	--------

Command (m for help): n

Command action

```
e extended
p primary partition (1-4)
```

Select the type of partition



```
root@localhost:~
File Edit View Search Terminal Help
Disk /dev/sdb: 8589 MB, 8589934592 bytes
255 heads, 63 sectors/track, 1044 cylinders
Units = cylinders of 16065 * 512 = 8225280 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk identifier: 0x686f4180

Device Boot      Start          End      Blocks   Id  System

Command (m for help): n
Command action
  e   extended
  p   primary partition (1-4)
p
Partition number (1-4): 1
First cylinder (1-1044, default 1):
Using default value 1
Last cylinder, +cylinders or +size{K,M,G} (1-1044, default 1044): +2048M
Command (m for help): █
```

عند اختيار حرف p ده معناه ان الاختيار هو primary  
Partition number دليل علي رقمه علي الديسك  
سؤال انه يكون في الاول اضغط enter  
سؤال المساحة اكتب 2GB او 2048M

- p → print partition table

لاستعراض جدول ال partitions بداخل ال  
sdb  
وجدنا انه يوجد partition sdb1

الآن يجب استعراض الجدول من خلال امر `p`  
نجد عندها تم انشاء ال `partition`  
يجب الضغط علي **W** للحفظ

Command (m for help): `p`

Disk /dev/sdb: 8589 MB, 8589934592 bytes  
255 heads, 63 sectors/track, 1044 cylinders  
Units = cylinders of 16065 \* 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x686f4180

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		1	262	2104483+	83	Linux

Command (m for help):

# To save the change in the disk

1. Type W **to save change**
2. Type `partprobe /dev /sdb` **to get kernel read the changes**

الضغط علي حرف p لظهار  
الجدول الان يحتوي علي sdb1  
الضغط علي W للحفظ  
كتابة partprobe  
لجعل ال kernel تعيد قراءة ال  
partition table  
بالتغيرات الجديدة

Command (m for help): p

Disk /dev/sdb: 8589 MB, 8589934592 bytes  
255 heads, 63 sectors/track, 1044 cylinders  
Units = cylinders of 16065 \* 512 = 8225280 bytes  
Sector size (logical/physical): 512 bytes / 512 bytes  
I/O size (minimum/optimal): 512 bytes / 512 bytes  
Disk identifier: 0x686f4180

Device	Boot	Start	End	Blocks	Id	System
/dev/sdb1		1	262	2104483+	83	Linux

Command (m for help): w

The partition table has been altered!

Calling ioctl() to re-read partition table.

Syncing disks.

[root@localhost ~]# partprobe /dev/sdb

sdb sdb1

# Step 2: Format the Partition

- Once a partition has been created with the **parted** or **fdisk** command, format it before using it.
- Format the partition by running the following command:
- **mkfs -t ext4 /dev/sdb1**

# Step 3: Mount the Partition

- To begin interacting with the disk, create a **mount point** and **mount the partition** to it.
- 1. **Create a mount point** by running the following command:
  - `((mkdir -p /mt/sdb1))`
- After that, **mount the partition** by entering:
  - `((sudo mount -t auto /dev/sdb1 /mt/sdb1))`
- The terminal does not print out an output if the commands are executed successfully.
- 3. **Verify** if partition is mounted by using
  - `(( df hT ))`

# Sheet

1. First step to create partition sdb using
  - a. Fdisk -l
  - b. Fdisk /dev/sdb
  - c. Fdisk /dev
  - d. all the above
2. The second step for make partition
  - a. Create
  - b. format
  - c. mount
  - d. none
3. To close the window of create partition type
  - a. n
  - b. p
  - c. q
  - d. m
4. If we want to rapid boot time and file access use
  - a. HDD
  - b. SSD
5. We can divide the disk into ..... primary partitions
  - a. 3
  - b. 4
  - c. 5
  - d. 6