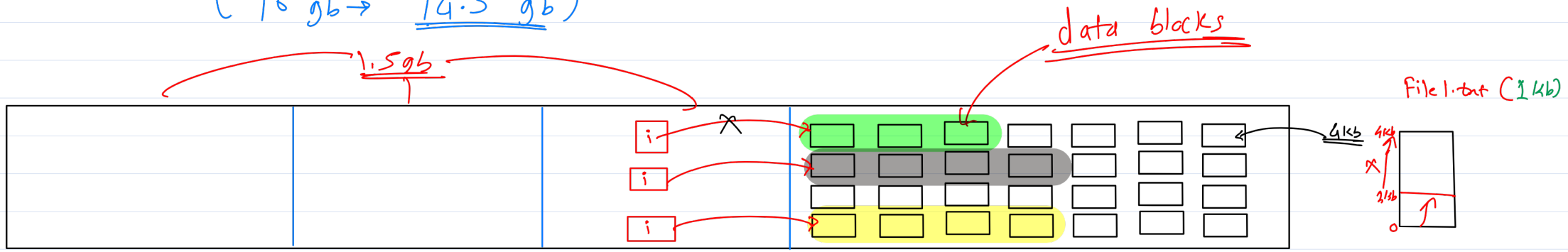
* File Management.

* File System (2Tb →

(16 gb → 14.5 gb)



boot block
or
boot Sector
↳ Bootstrap prog.
→ Bootloader prog.

Super block
or
Volume Controll block
↳ Volume Name
↳ size
→ file system
→ free data blocks

master file Table
or
inode list

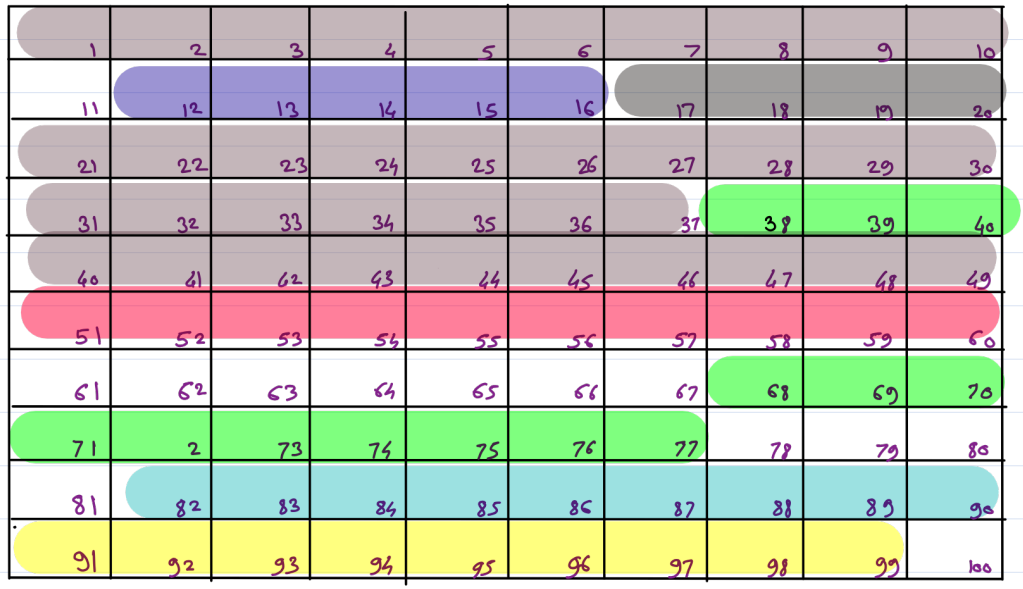
Data block.

* Disk Space Allocation Method.

am[5]

(1) Contiguous Allocation. (am)

Data blocks



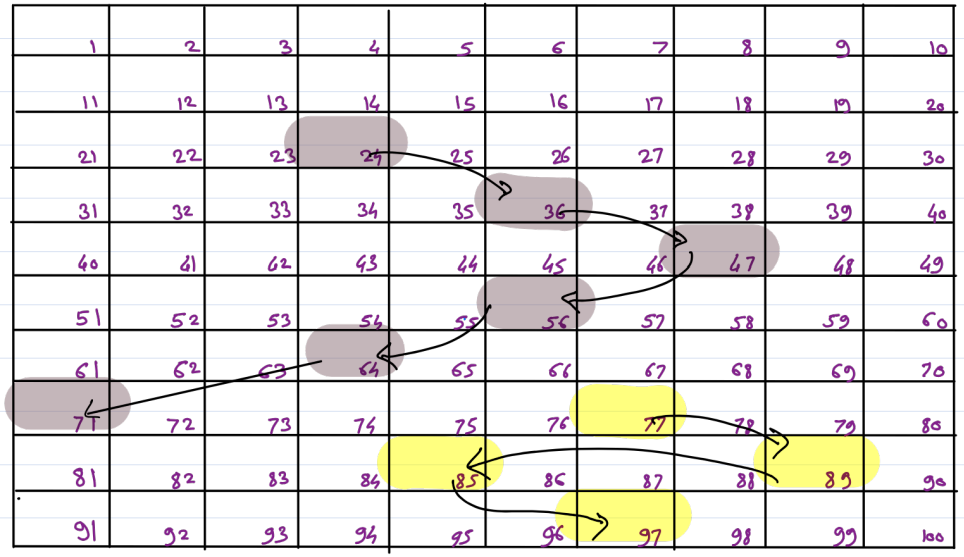
	start	size
File1.txt	12	5
File2.txt	38	3
File3.txt	68	10
File4.txt		10

stored in inode.

* pros
  - sequential accesses
  - random accesses

* cons
  - File may not grow
  - external frag
    - soln → Defragmentation.

(2) Linked Allocation

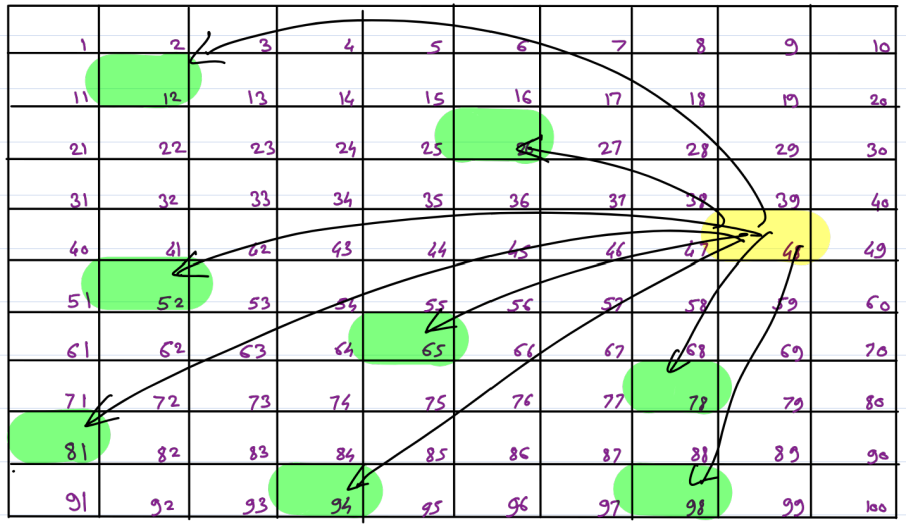


	start	end
file3.txt	24	71
file2.txt	77	97

* pros
  - Sequential accesses
  - no file grow limit
  - no external frag.

* Cons
  - slow random accesses.

③ Indexed Allocation.

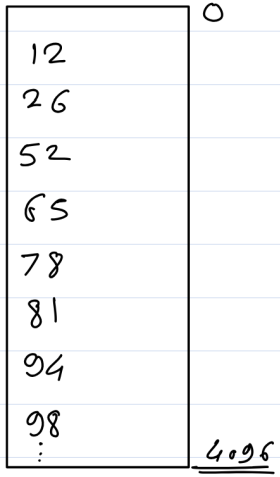


Index → 48

file.txt

Index block information stored Inode

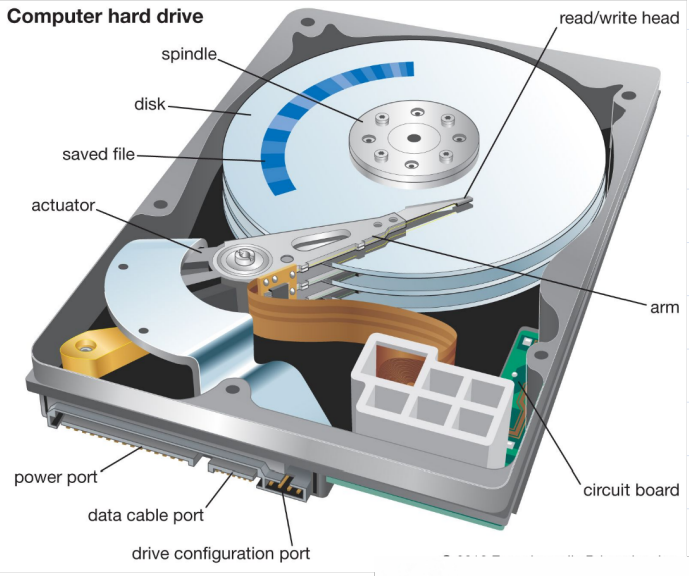
Index block (4k)
48

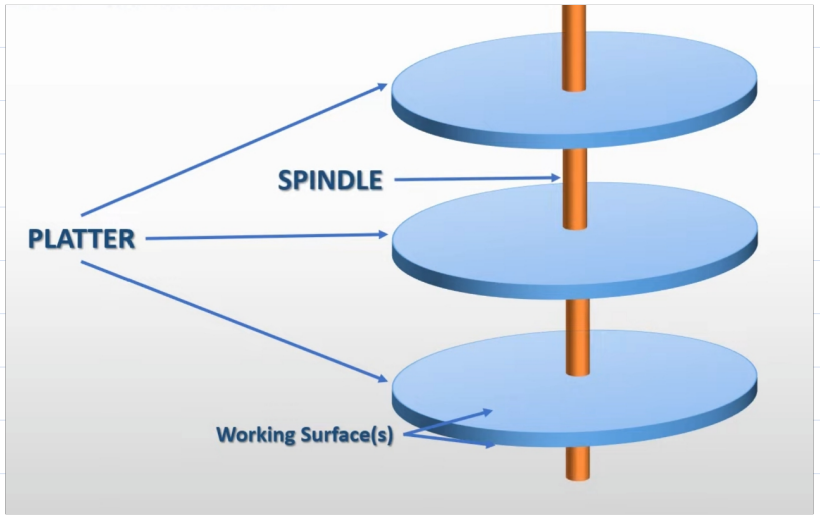


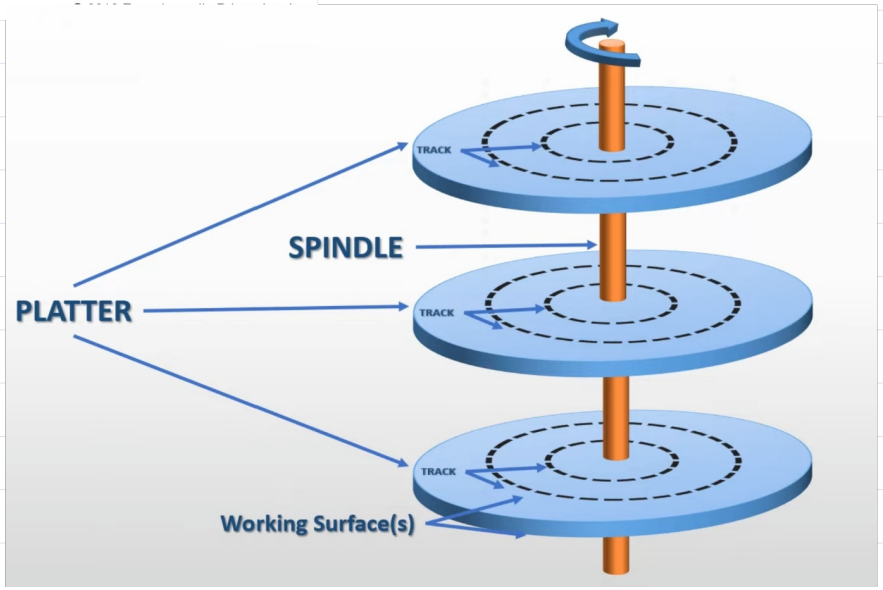
* Pros
  - Sequential accesses
  - random accesses
  - no external frag.

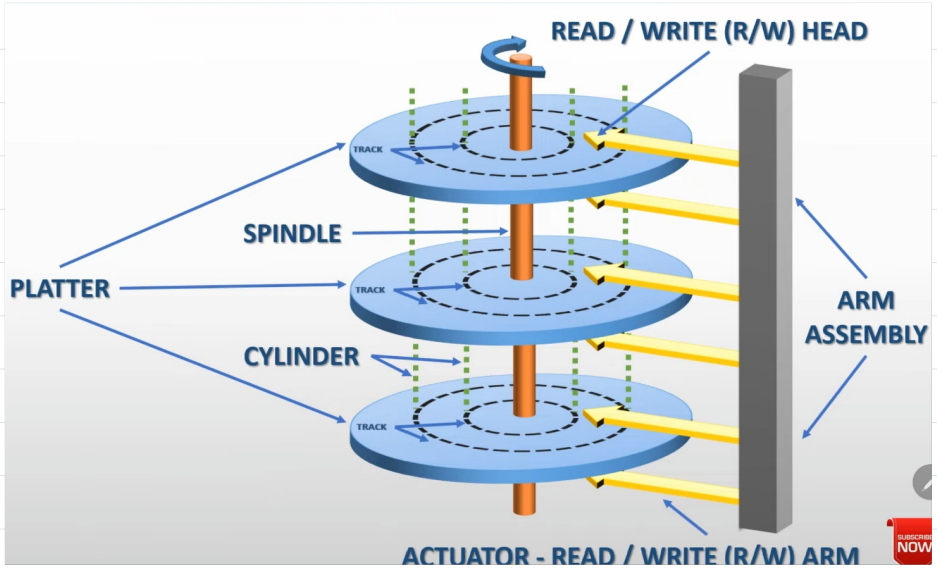
* Cons
  - File can grow upto some limit.

* Hard Disk Structre.

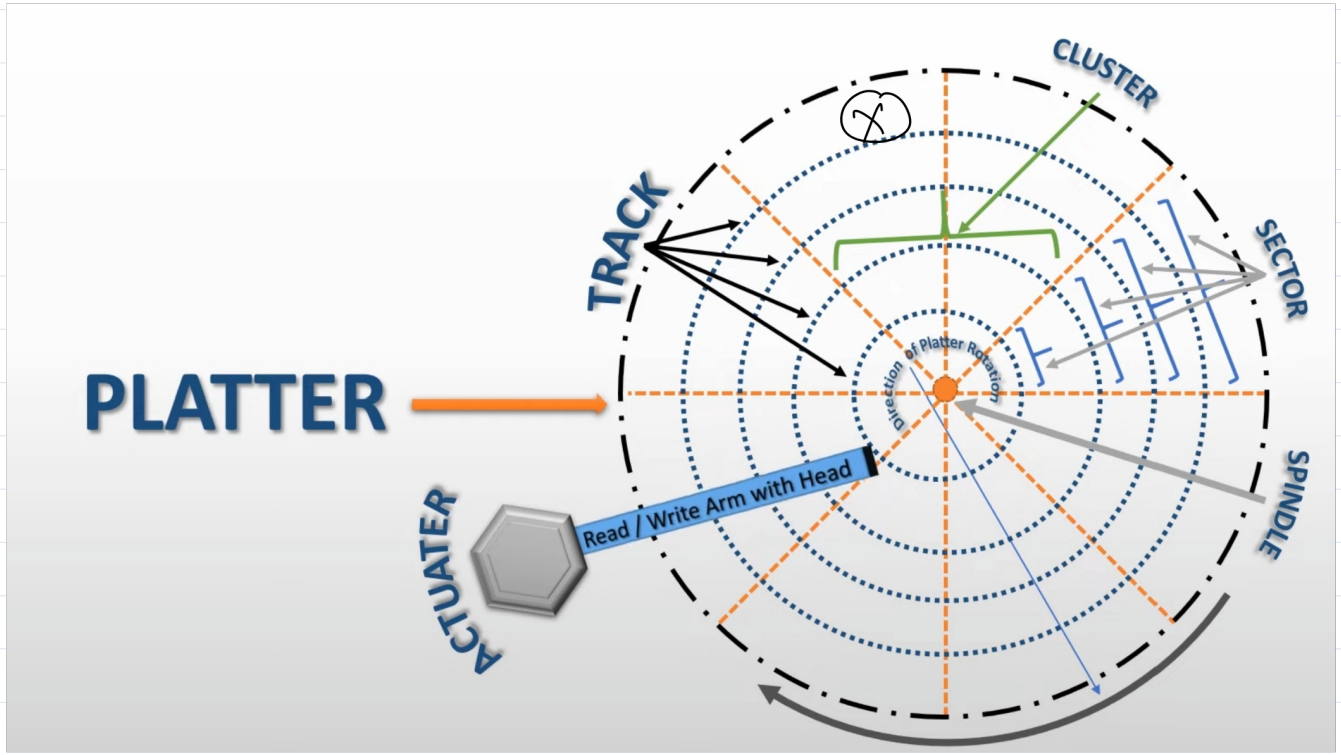


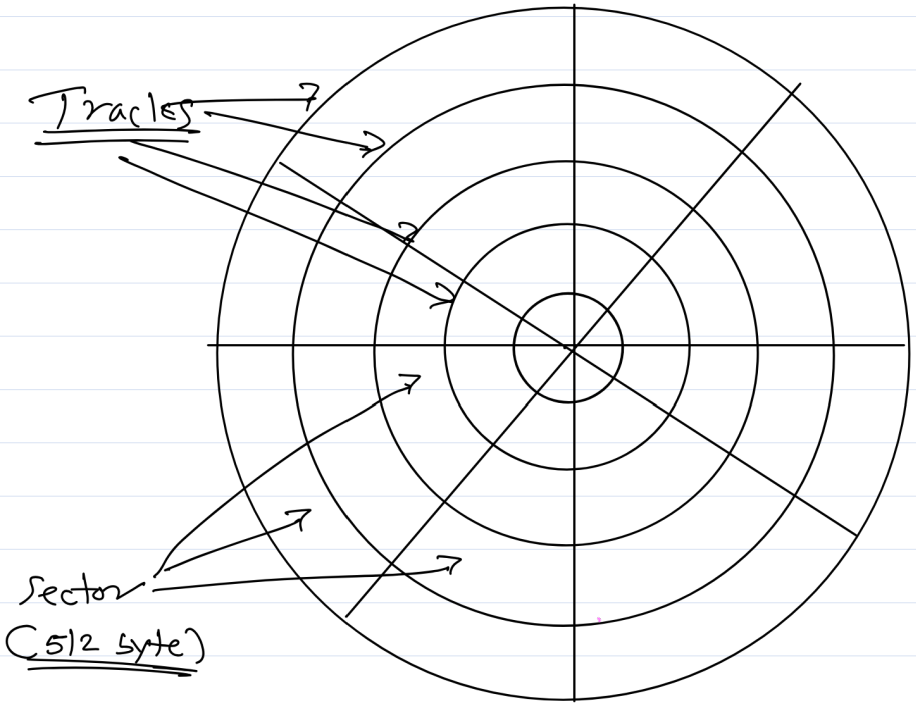






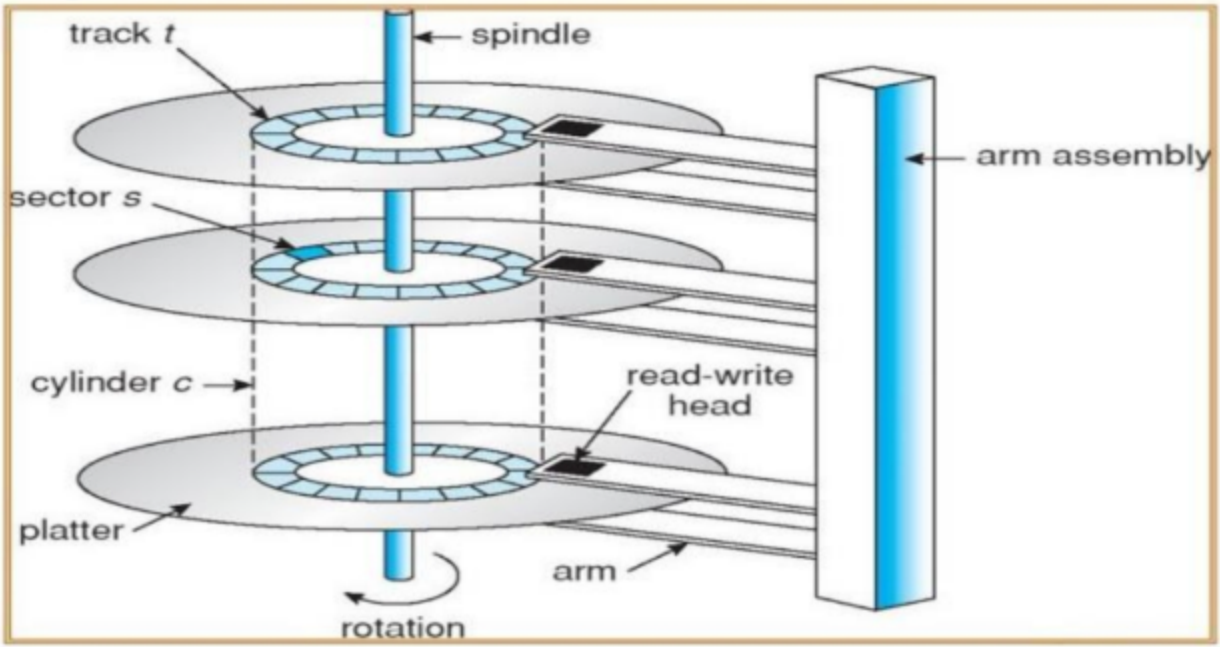
* Read / Write from HDD.





Computer Fundamentals and Operating Systems

Moving-head Disk Machanism

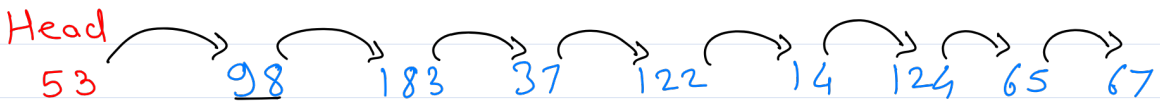


* Disk Scheduling Algo.

① FCFS

e.g: Current Head Position: 53

Request : 98 183 37 122 14 124 65 67



Seek

45 + 85 + 146 + 85 + 108 + 110 + 59 + 2 ⇒

W.Q.

98
183
37
122
14
124
65
67

Total Seek Distance

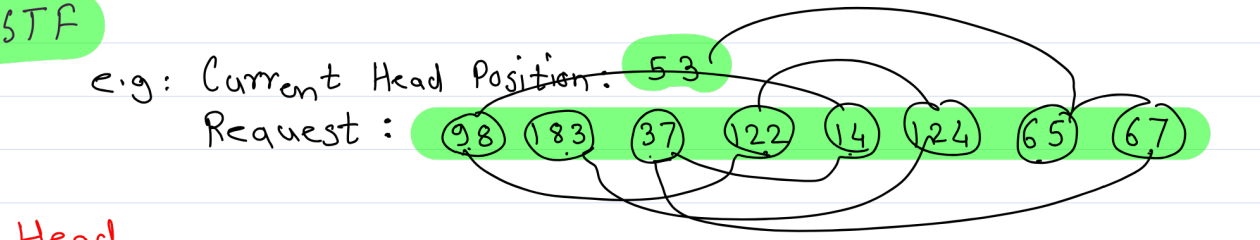
640

---

② SSTF

e.g: Current Head Position: ~~53~~

Request : 98 183 37 122 14 124 65 67



Seek

12 + 2 + 30 + 23 + 84 + 24 + 2 + 59

Total Seek Distance

236

③ SCAN Scheduling.

Max : 199
Min : 0

direction : Downward

e.g: Current Head Position: 53
Request : 98 183 37 122 14 124 65 67

Head
53 → 37 → 14 → 0 → 65 → 67 → 98 → 122 → 124 → 183

Seek
16 + 23 + 14 + 65 + 2 + 31 + 24 + 2 + 59 ⇒

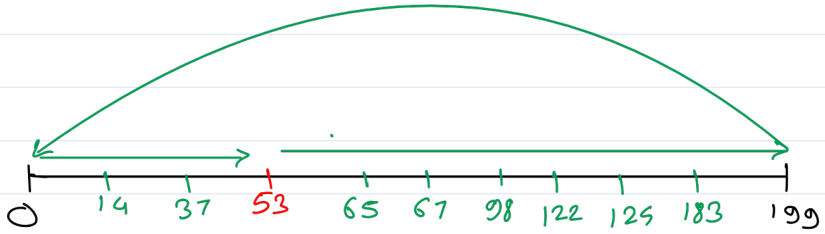
Total Seek Distance

236

④ C-SCAN Scheduling.

Max : 199
Min : 0

e.g: Current Head Position: 53
Request : 98 183 37 122 14 124 65 67



Head
53 → 65 → 67 → 98 → 122 → 124 → 183 → 199 → 0 → 14 → 37

Seek
12 2 31 24 2 59 16 199 14 23

Total Seek Distance

382

Scan / C-Scan

Max : 199
Min : 0

(5) C - look Scheduling.

e.g: Current Head Position: 53

Request : 98 183 37 122 14 124 65 67

Head

53 → 65 → 67 → 98 → 122 → 124 → 183 → 14 → 37

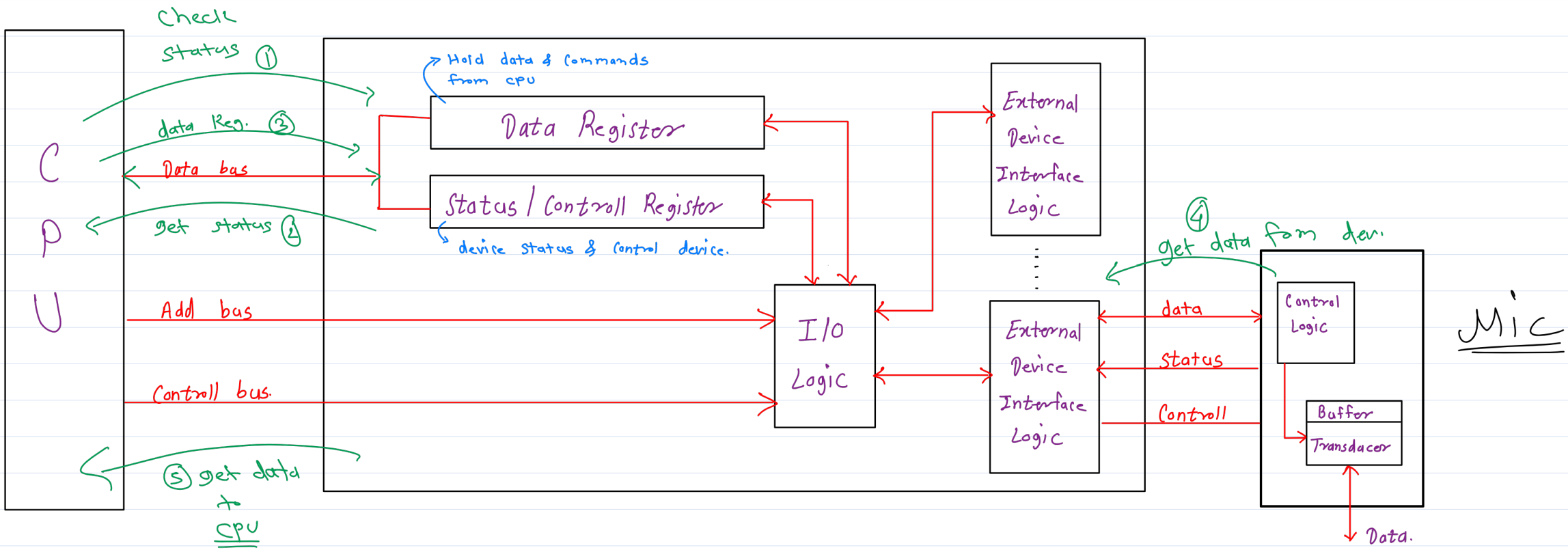
Seek

12 + 2 + 31 + 25 + 2 + 59 + 169 + 23

Total Seek Distance

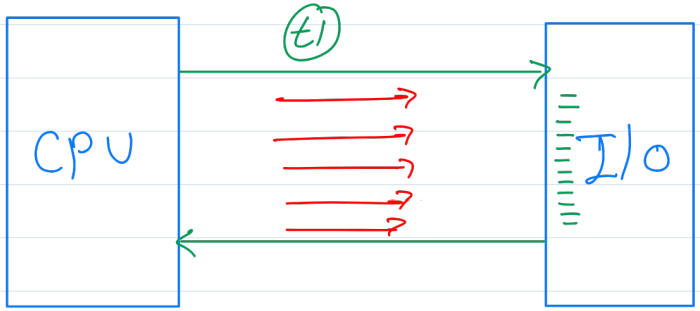
322

* I/O Module.


Check status (1)
data Req. (3)
Data bus
get status (2)
Add bus
Controll bus.
(5) get data to CPU
CPU
Hold data & commands from CPU
Data Register
Status / Controll Register
device status & control device.
I/O Logic
External Device Interface Logic
External Device Interface Logic
(4) get data fom dev.
data
status
Controll
Control Logic
Buffer
Transducer
Data.
Mic

I/O Techniques

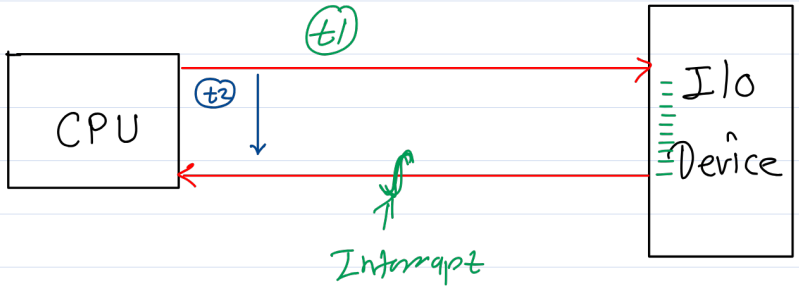
(1) Program driven I/O



(1) CPU keep asking (check status) I/O device if I/O is completed. This is called as "polling" or "programed I/O".

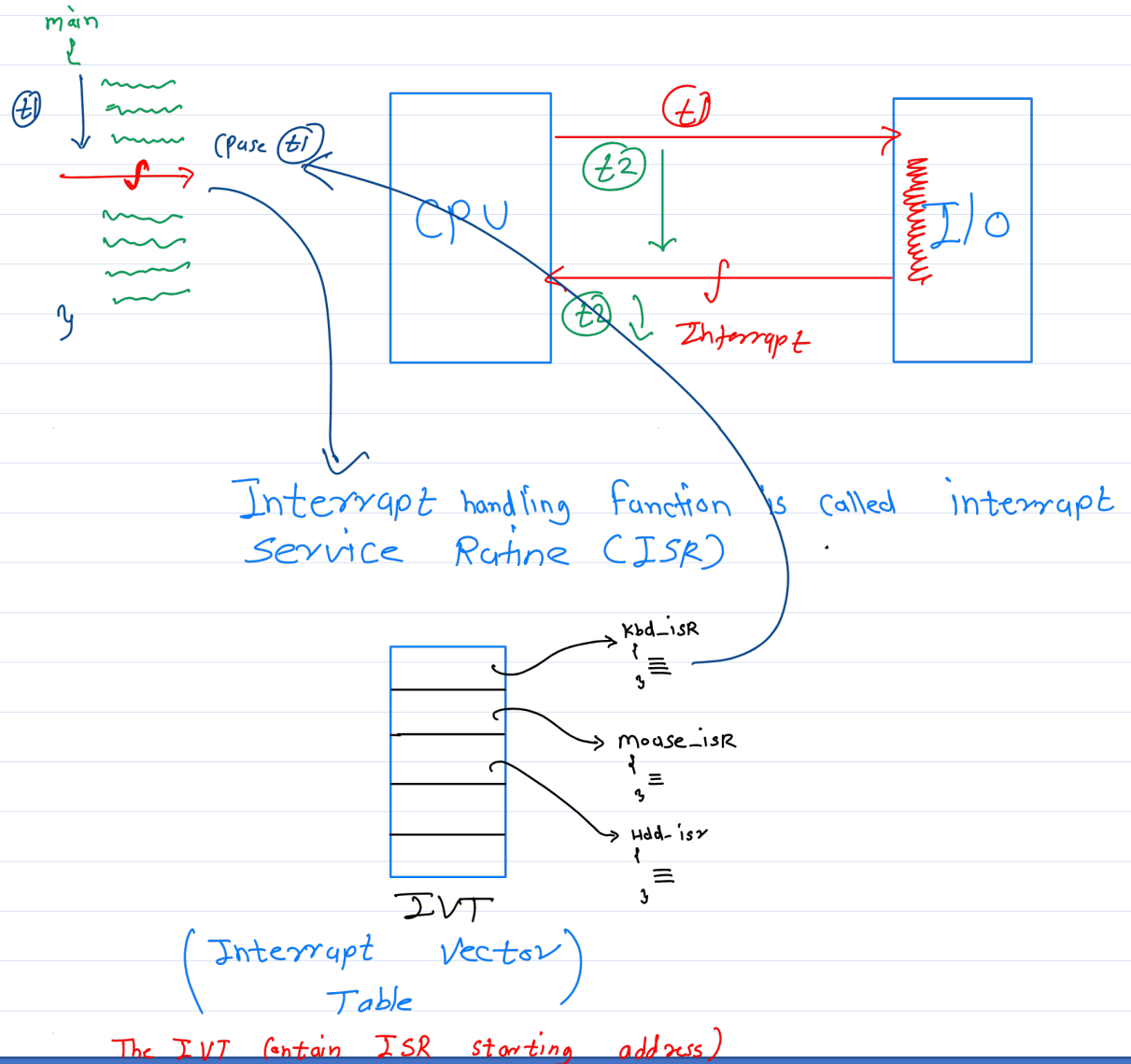
(2) OS is waiting for I/O to complete then it is called as "synchronus I/O".

(2) Interrupt I/O

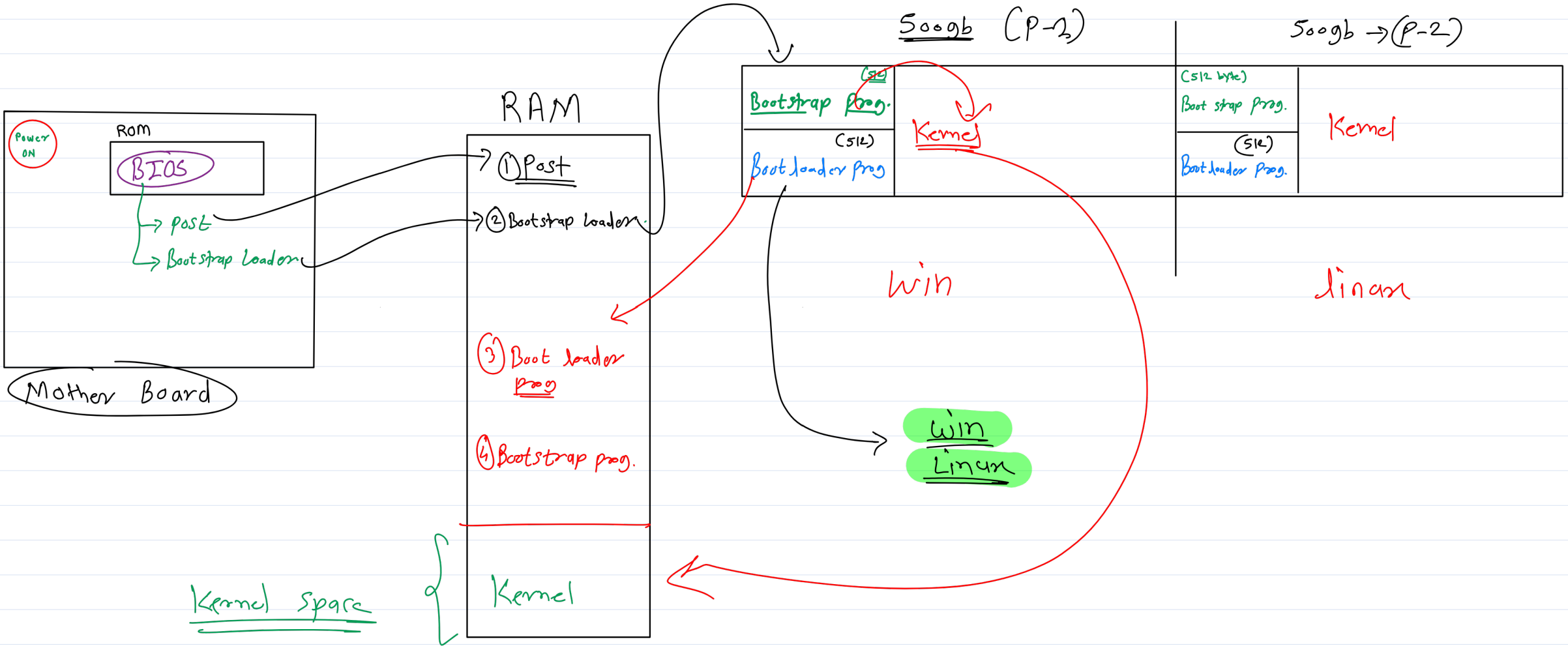


(1) CPU assign I/O task to I/O device and begin execution of another program.
- when I/O is done the device send signal to CPU, then CPU resume the earlier paused task.

(2) OS is not waiting for I/O to complete instead schedules another task to CPU. This is called "Asynchronous I/O".



* Booting.


HDD (Bootable Device)
500gb (P-1)
500gb → (P-2)
Power ON
ROM
BIOS
post
Bootstrap Loader
Mother Board
RAM
(1) Post
(2) Bootstrap Loader
(3) Boot loader prog
(4) Bootstrap prog.
Kernel space
Kernel
(512)
Bootstrap prog.
Boot loader prog
Kernel
(512 byte)
Boot strap prog.
(512)
Boot loader prog.
Kernel
win
linux
win
Linux

git CF

C-F → ① Types of O.S.

② Num Conversion
(Bin → Dec, oct, Hexa)

$(101|010|011)_2 \rightarrow (\quad)_8$
$(2\ 5\ 3)_8$

③ Memory fandamental.

④ I/O devices

⑤ ? (Booting, I/O, Virus)

O.S → ① Process mgm
→ Process defn, Kernel data structs.
→ IPC, synch., Deadlock.

② Cpu scheduling
→ state of process, process life cycle,
Cpu scheduling criteria, CPU scheduling Algo
↳ FCFS
↳ SJF
↳ RR
↳ Priority

③ Mem mgm
→ mmu,
→ mem allocation
↳ Contigeous allocation → Fixed, Variable (Free slot table)
& advantage / disadvan
↳ Non-Contig — Segm
↳ Paging → Concept
→ Paging mmu
→ page Replacement algo.
↳ LRU
↳ opr
↳ FIFO