

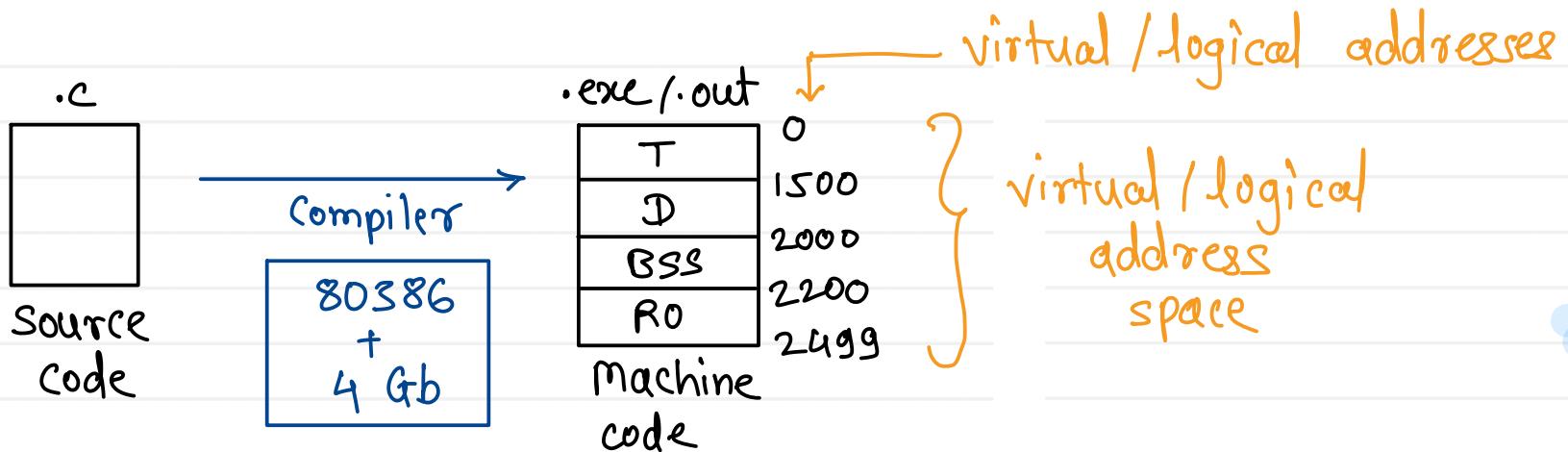


**Sunbeam Institute of Information Technology
Pune and Karad**

Module - Embedded Operating System

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Memory management



CPU always executes process in virtual address space

- MMU (Memory Management Unit) is used to convert logical addresses into physical addresses.
- MMU Hardware is present inside CPU chip itself

Types of MMU :

1) Simple MMU

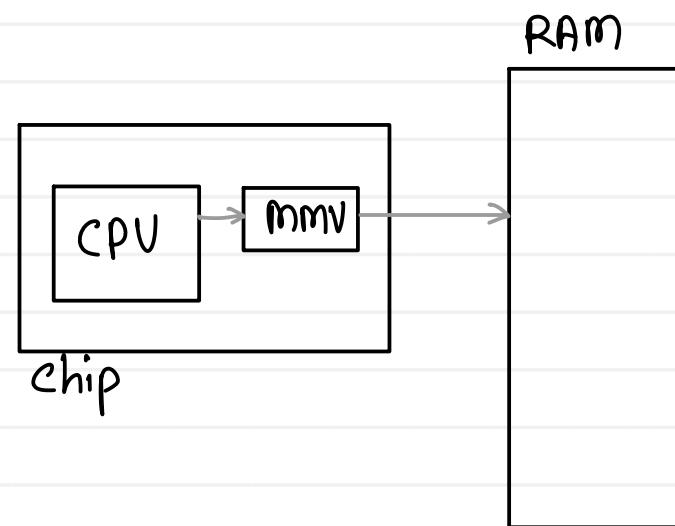
2) Segmentation MMU

3) Paging MMU

• Contiguous memory allocation

• Segment wise allocation

• Page wise allocation



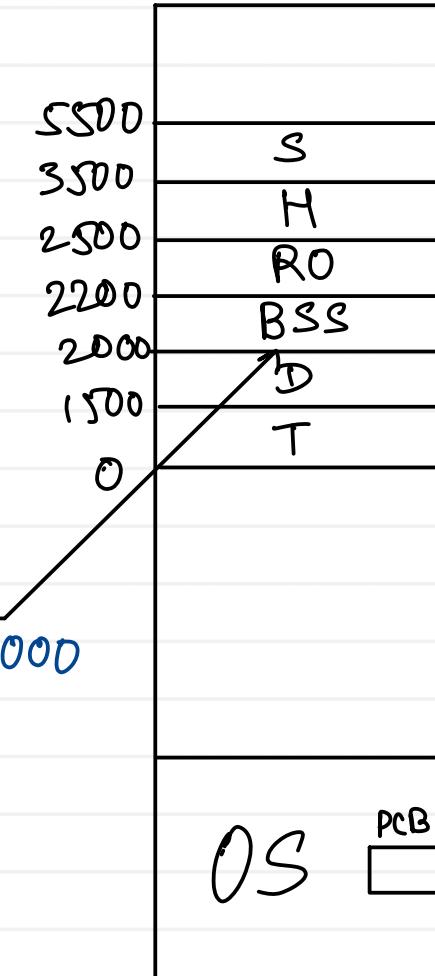
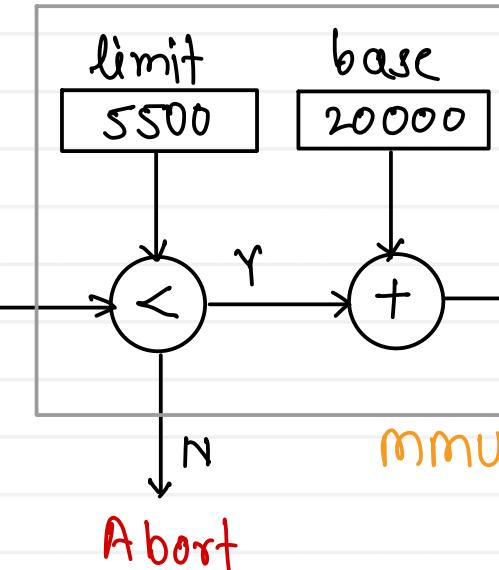
.exe/.out

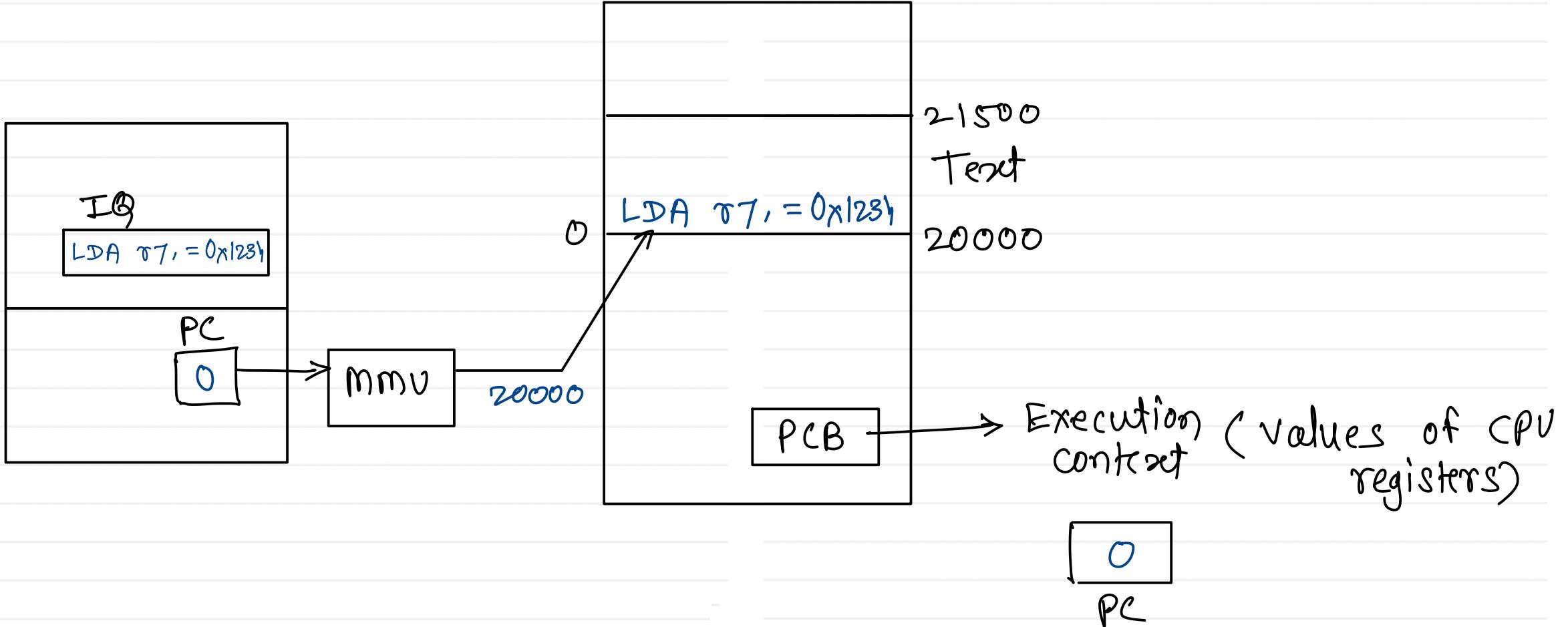
T	0
D	1500
BSS	2000
RO	2200
	2499

Machine code

Loader

CPU 2000

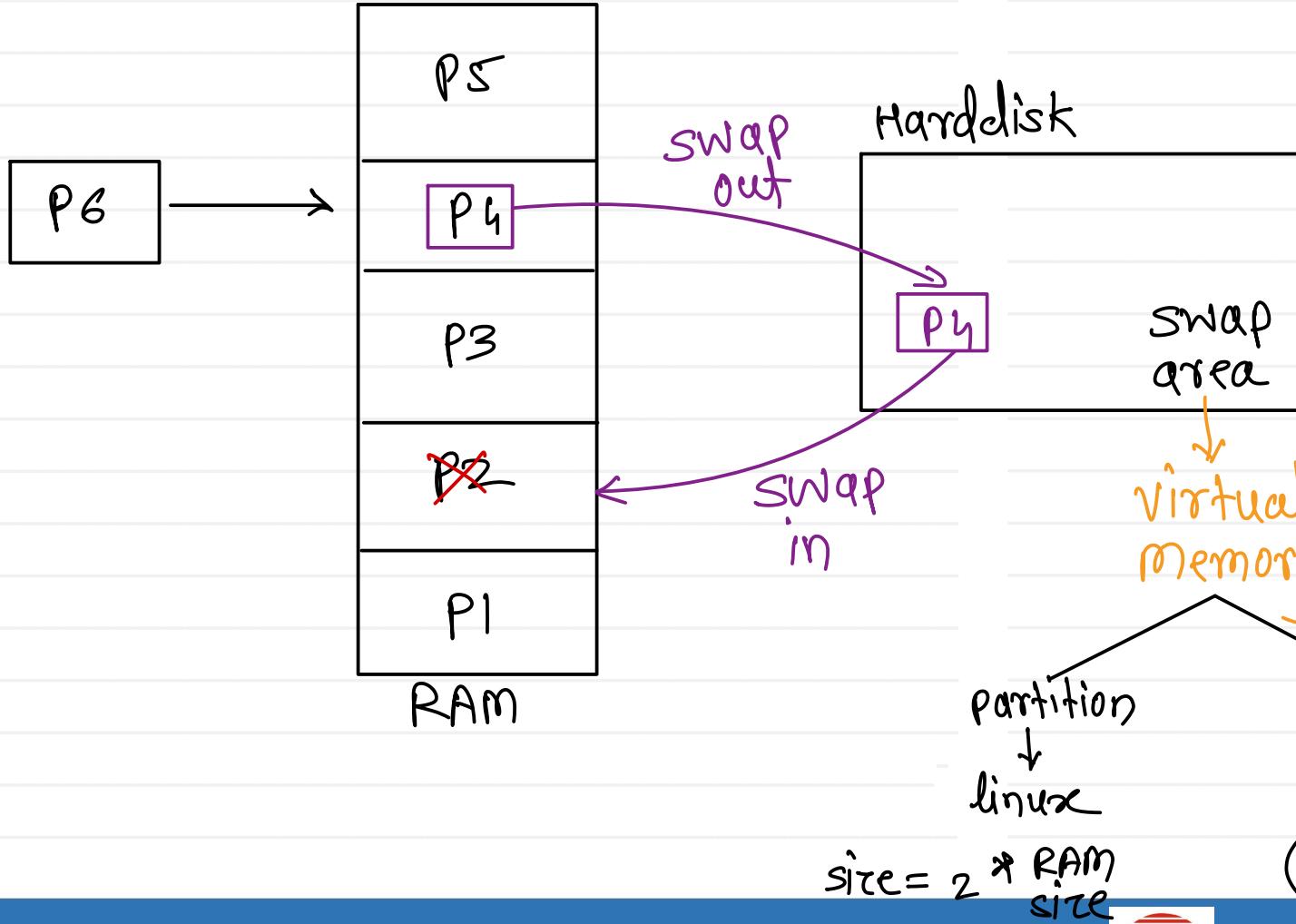






Virtual memory

virtual memory - extension to main memory (RAM)





File

File = collection of data

File = data + meta data

(Actual Content (information about
of file) file)

(data block)

- name, location/path
- size
- type
- no. of links
- permissions
 - r - read, w - write, x - execute
 - u - user, g - group, o - others
- timestamps
 - create, access, modify
- user/owner, group
- info about data blocks

File
Control
Block
(FCB)



type
 ↓
 -rwx-rwx-r-- no. of links
 ↓ ↓
 1 sunbeam sunbeam size (bytes)
 permissions/Access/mode user/owner group ↓
 ↑ ↑ ↑
 timestamp name
 Oct 4 10:07 sample.txt

Types of files :

- 1> Regular file (-)
- 2> Directory file (d)
- 3> Link file (l)
- 4> Pipe file (p)
- 5> Socket file (s)
- 6> Char special file (c)
- 7> Block special file (b)

Permissions :

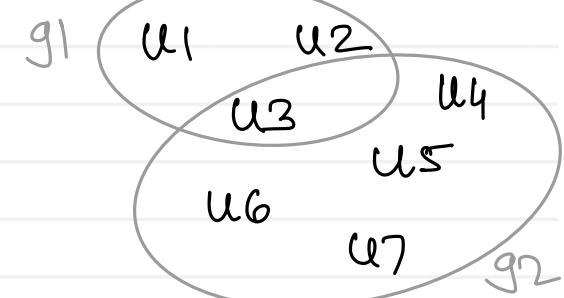
r - read
 w - write
 x - execute

levels :

u - user/owner
 g - group
 o - others

rwx-rwx-r--
 ↑ ↑ ↑
 u g o

Groups :

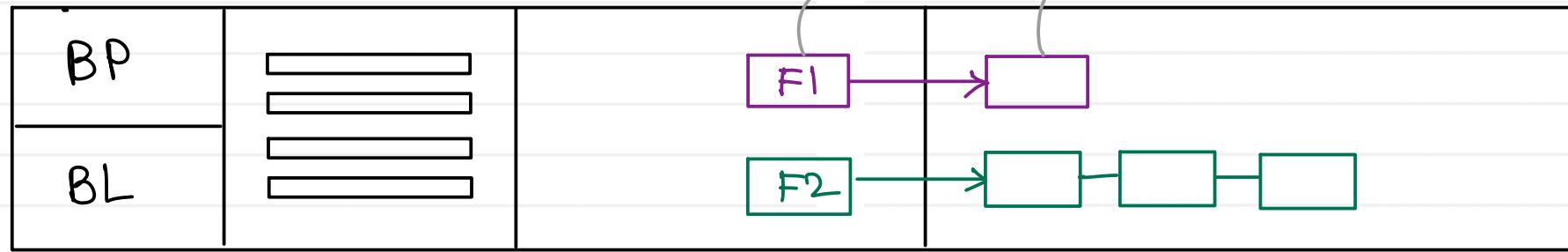


file name : sample.txt
 user/owner : u1 (rwx-)
 file group : g1 (rwx-)
 others : g2 (r--)

File system

File system : Organizing files on harddisk partition

Boot block super block
Hddisk partition :



Boot sector
↓

contains two programs
which are needed
for booting

- 1> Bootstrap program
- 2> Boot loader

volume
control
Block
↓

info about volume/partition

- label
- size
- filled, empty
- info about free data blocks

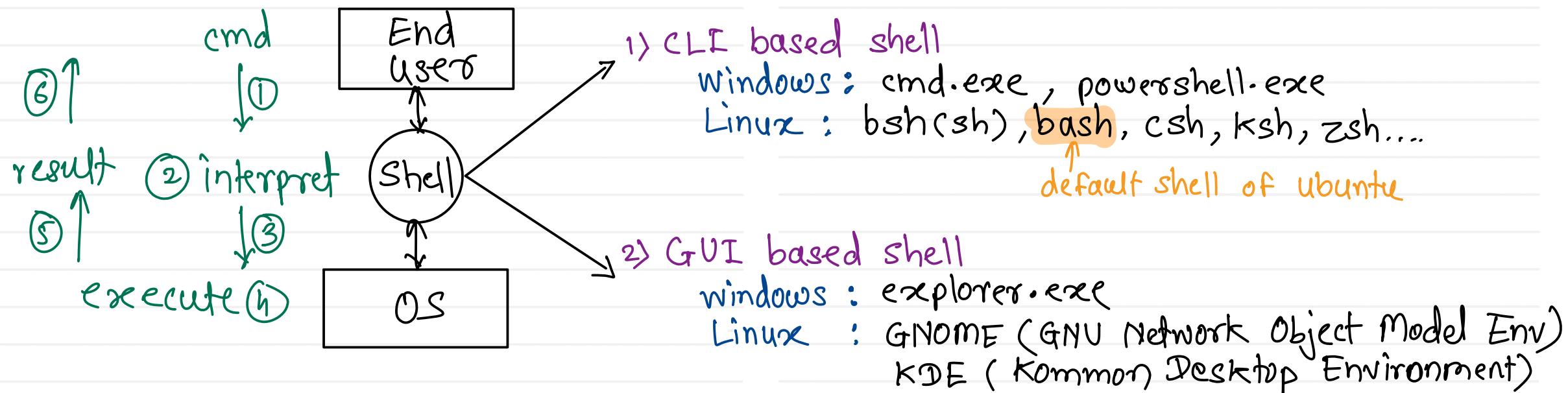
Master
file
table

Data
Blocks

- size of data block is
fixed but it is
configurable at the
time of formatting
size = 4096 bytes

User interfacing

- User interface is provided by one program and it is called as shell.
- shell is called as command interpreter
- shell is an intermediate betⁿ OS & user





Thank you!!!

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