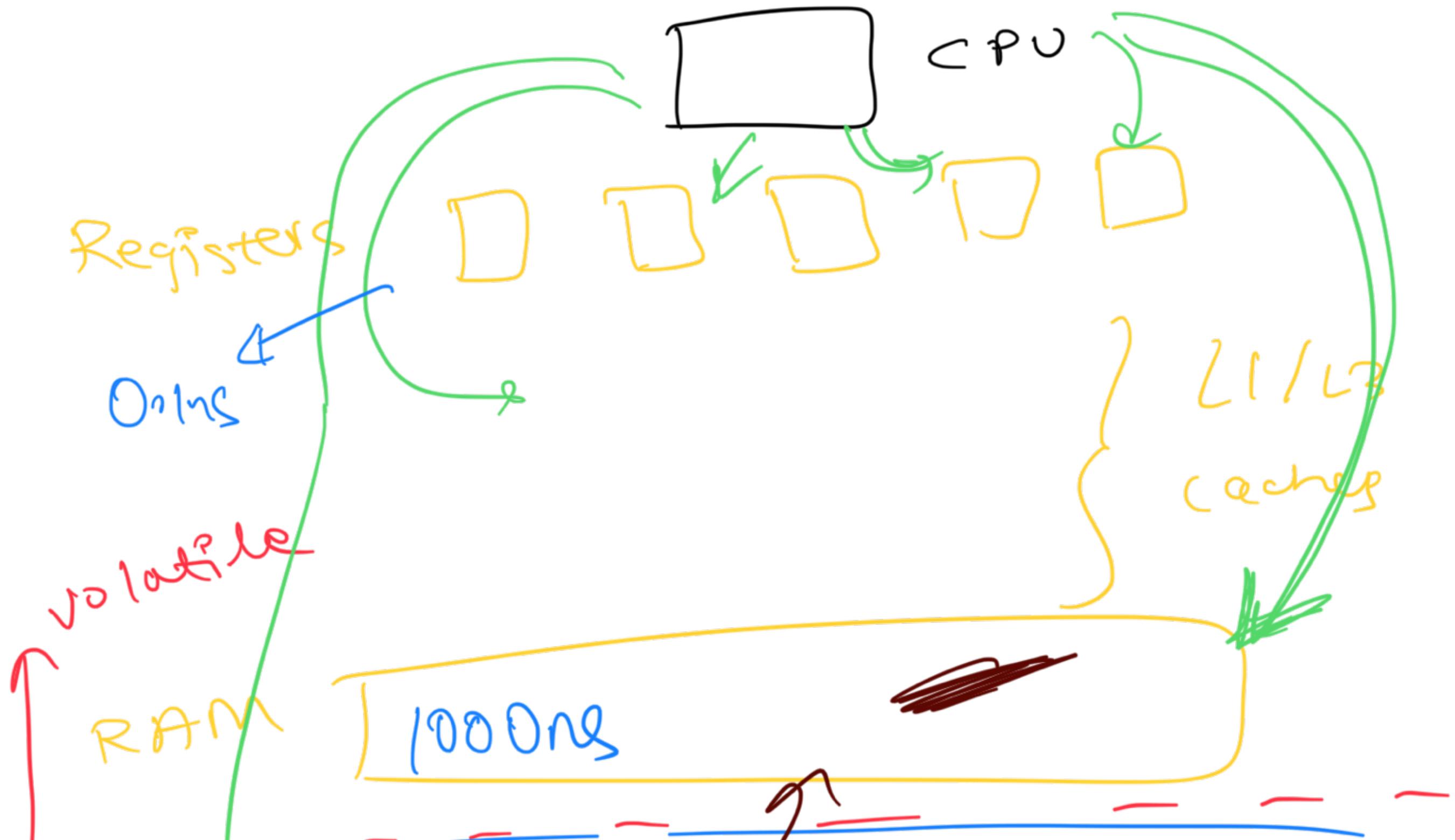
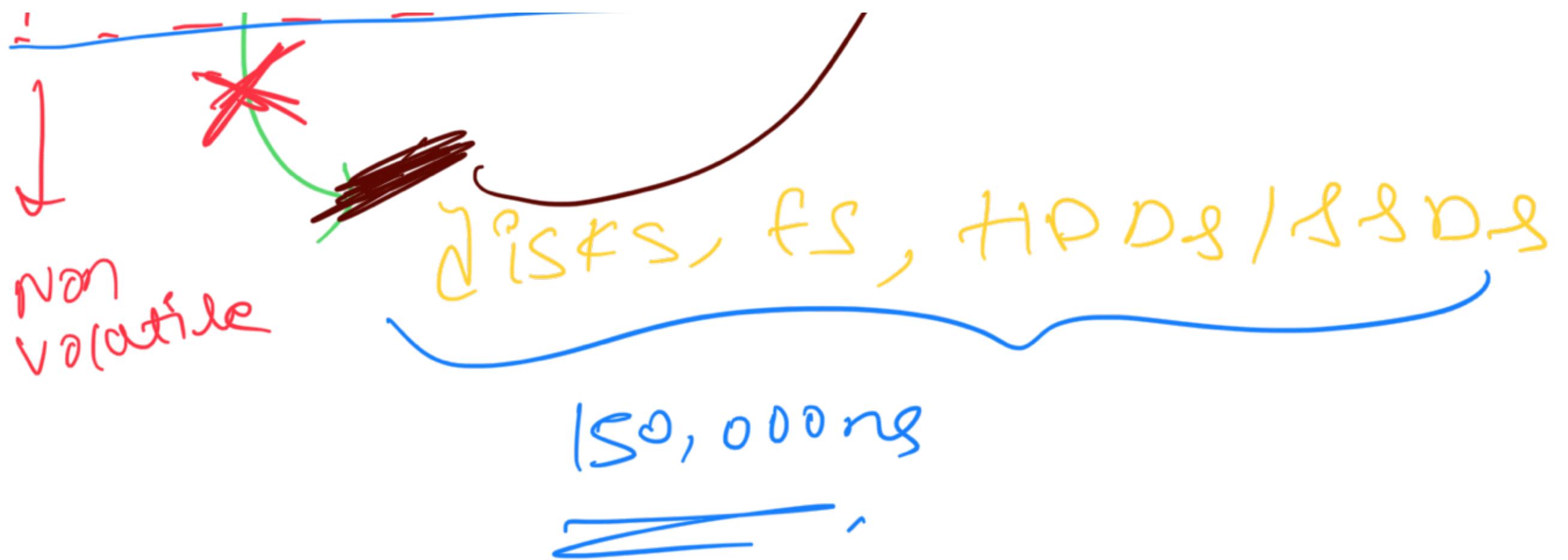
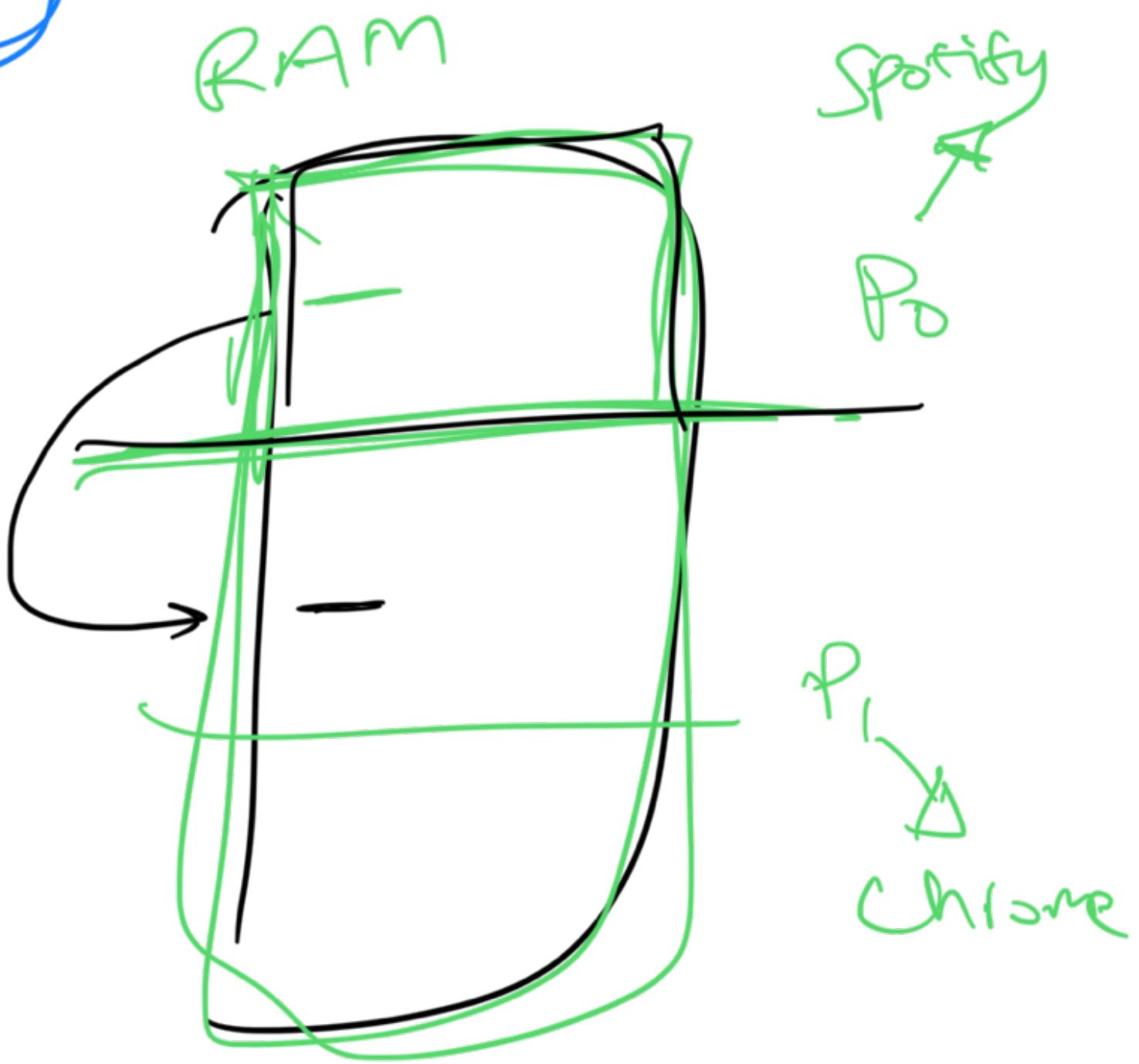
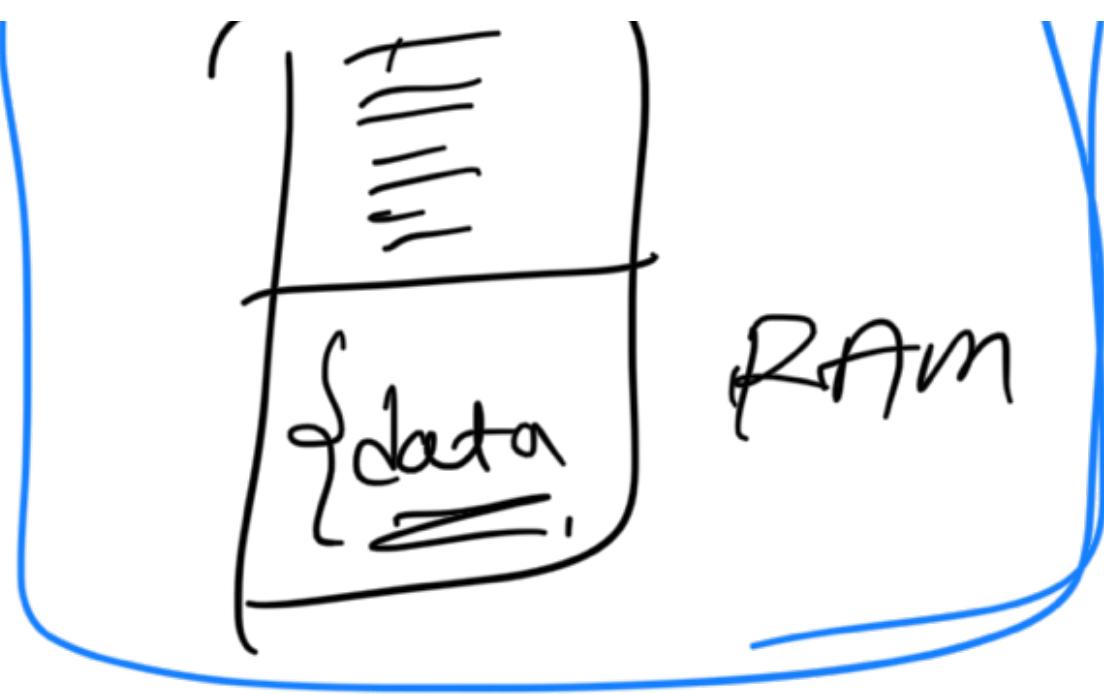


Operating Systems - II





- * We have to bring programs into the RAM to execute them.

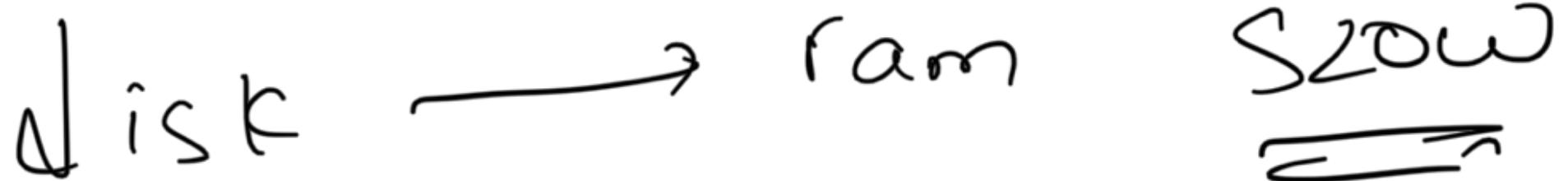


* Secure

~~A~~ memory isolation.

~~A~~ memory allocation / dealloc.

Bringing up from



Example

Turn in

Assembly

a.c.

a ++] → N₁

b ++]

for (i=0; i <= 3; i++)

a ++
|
|

add al, 1
inc cx
cmp cx, 3
jne .

Compile

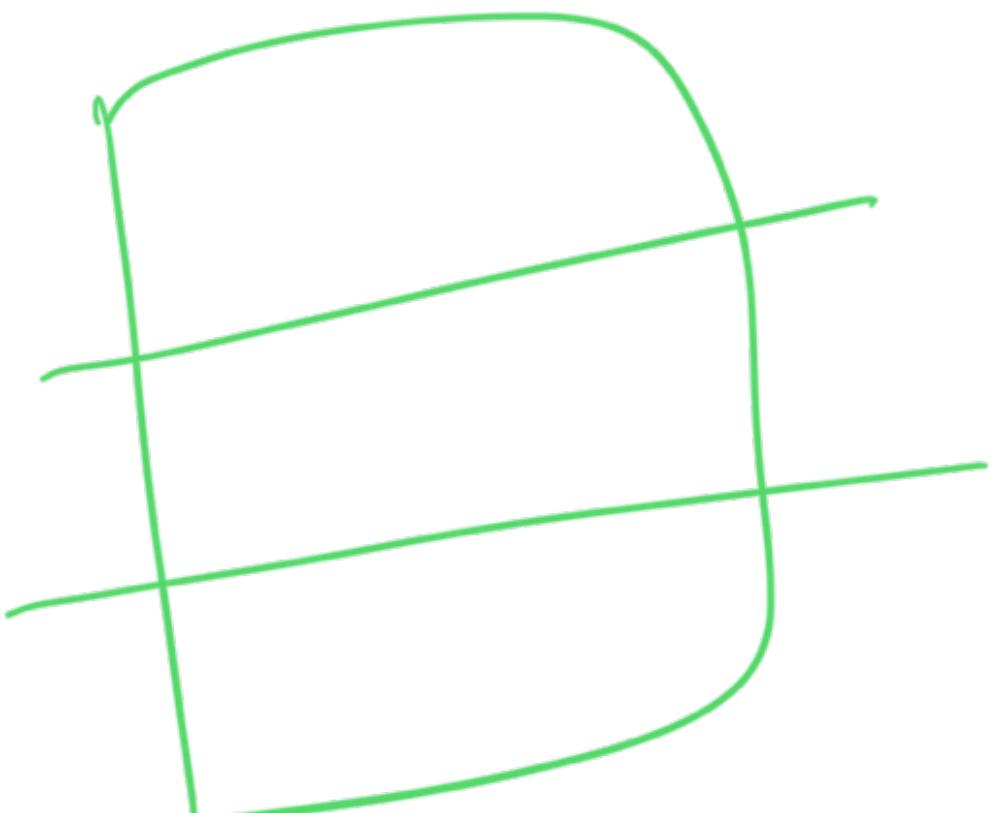
cout << accb.

~~DISK~~

jue addy

~~DISK~~

run



Physical addressing

~~Compile~~ → inc mn

jle addy

Physical addresses are not

working.

for ()
{
}

x
cmb cn, 3
:
;
jxe x



I

for (

i = 0

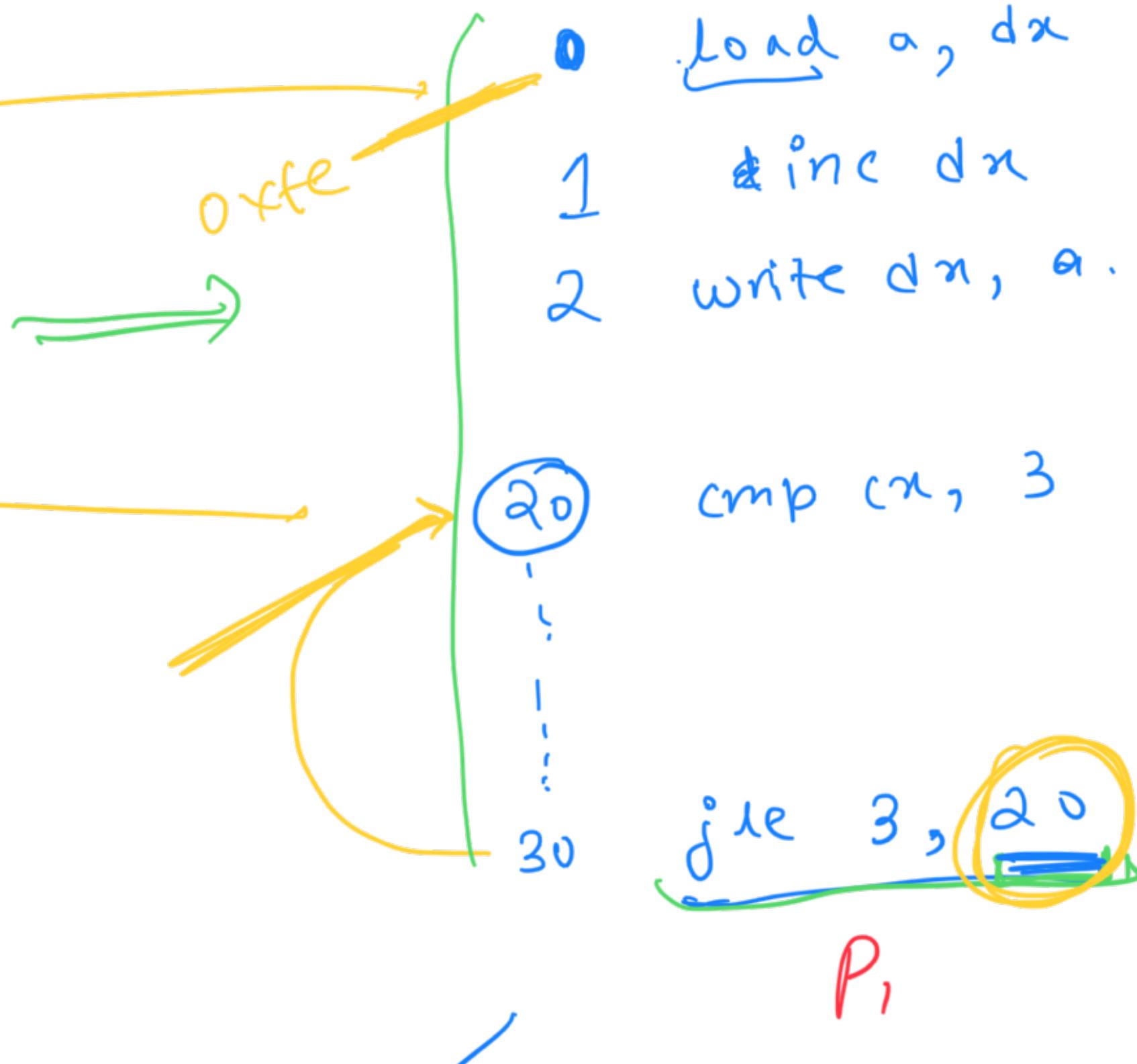
;

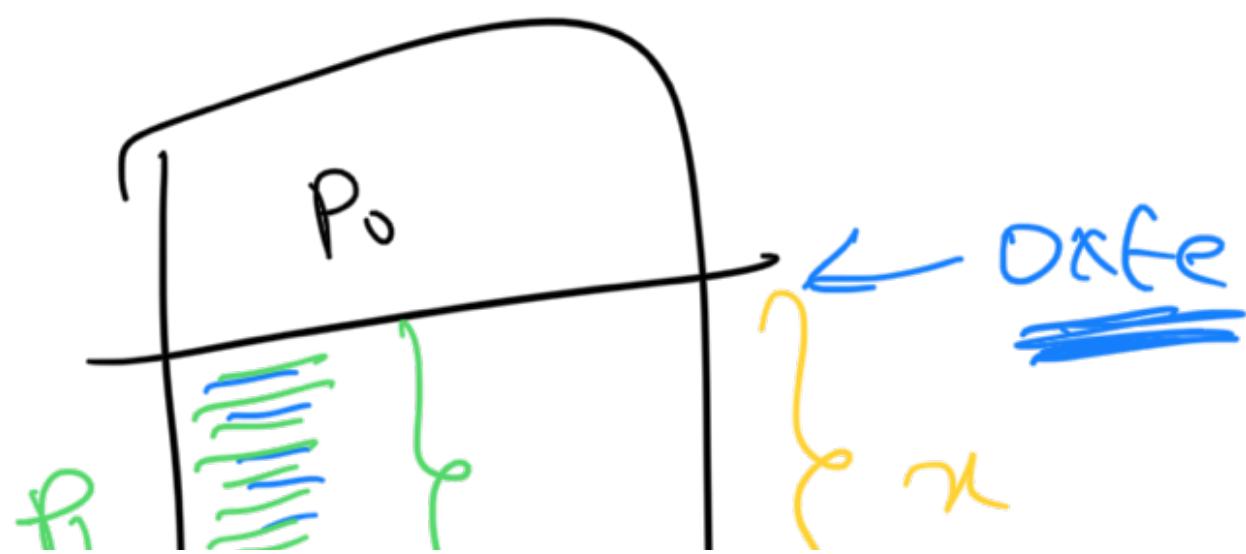
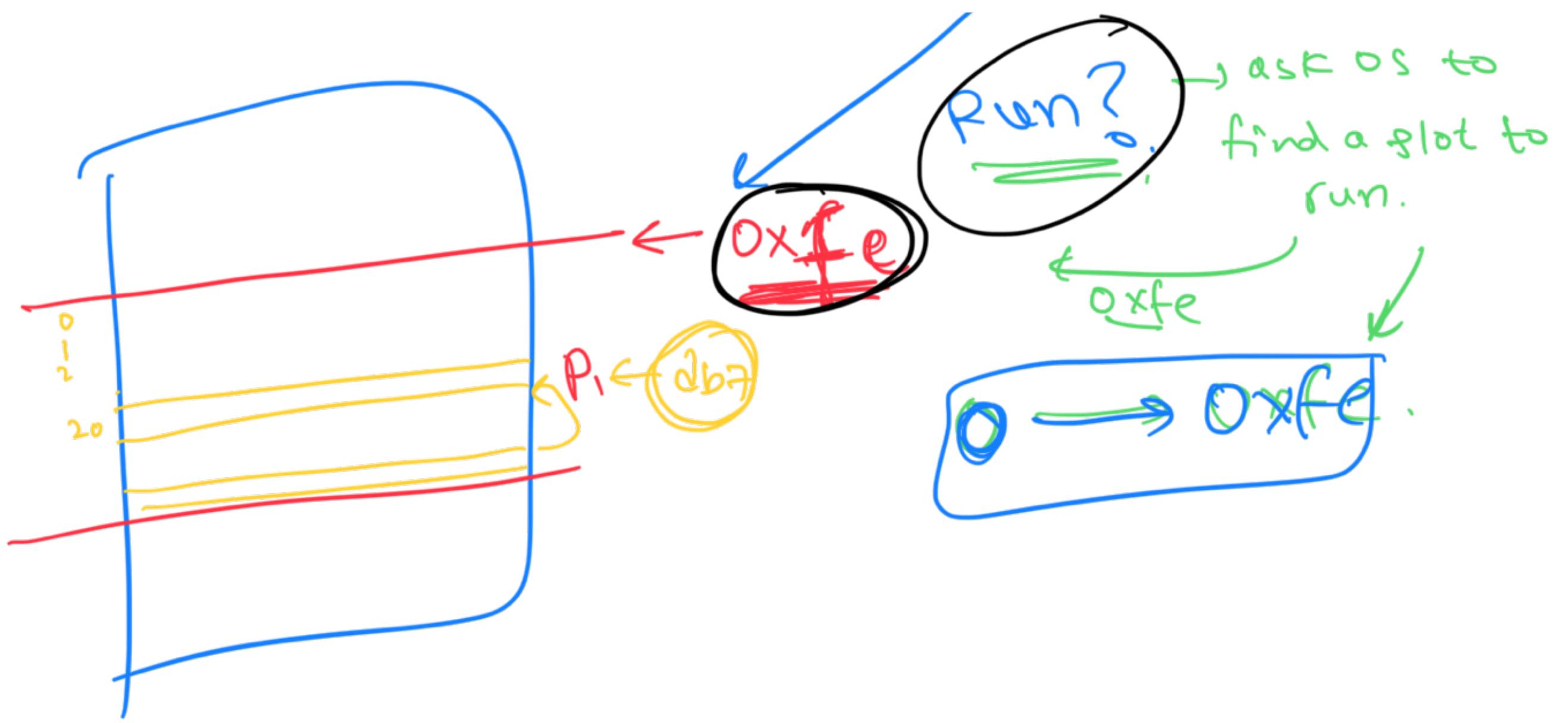
rog's car

a ++
b ++

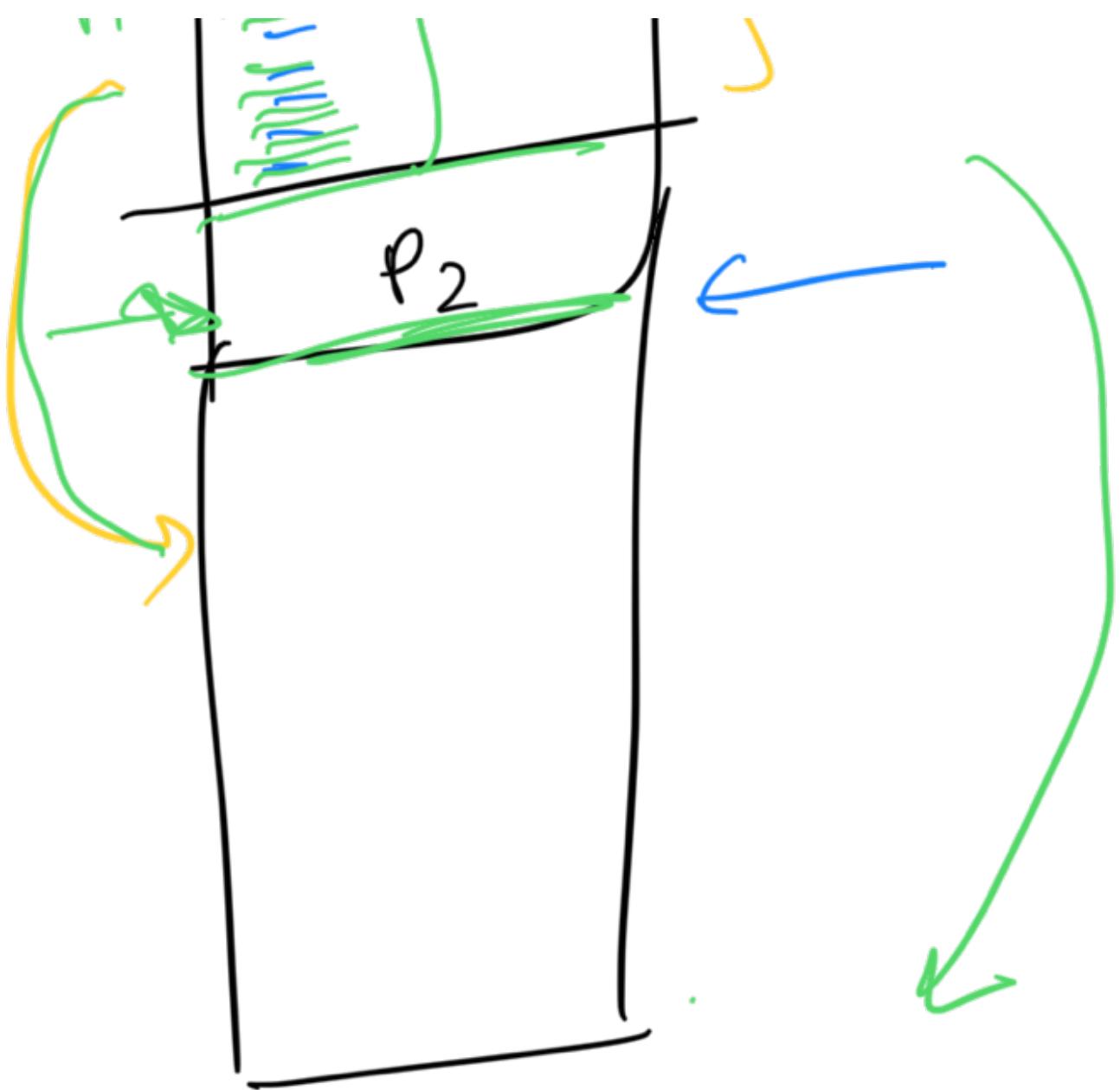
for q
}

'D'

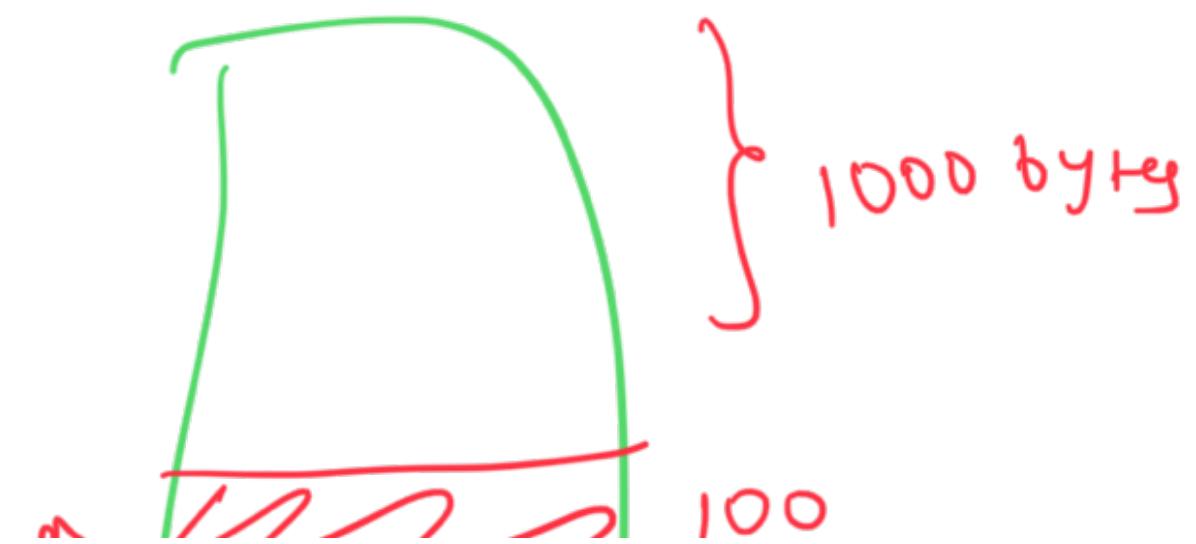




$$0x1fe + 20 \times () = \underline{\underline{0xb7}}$$



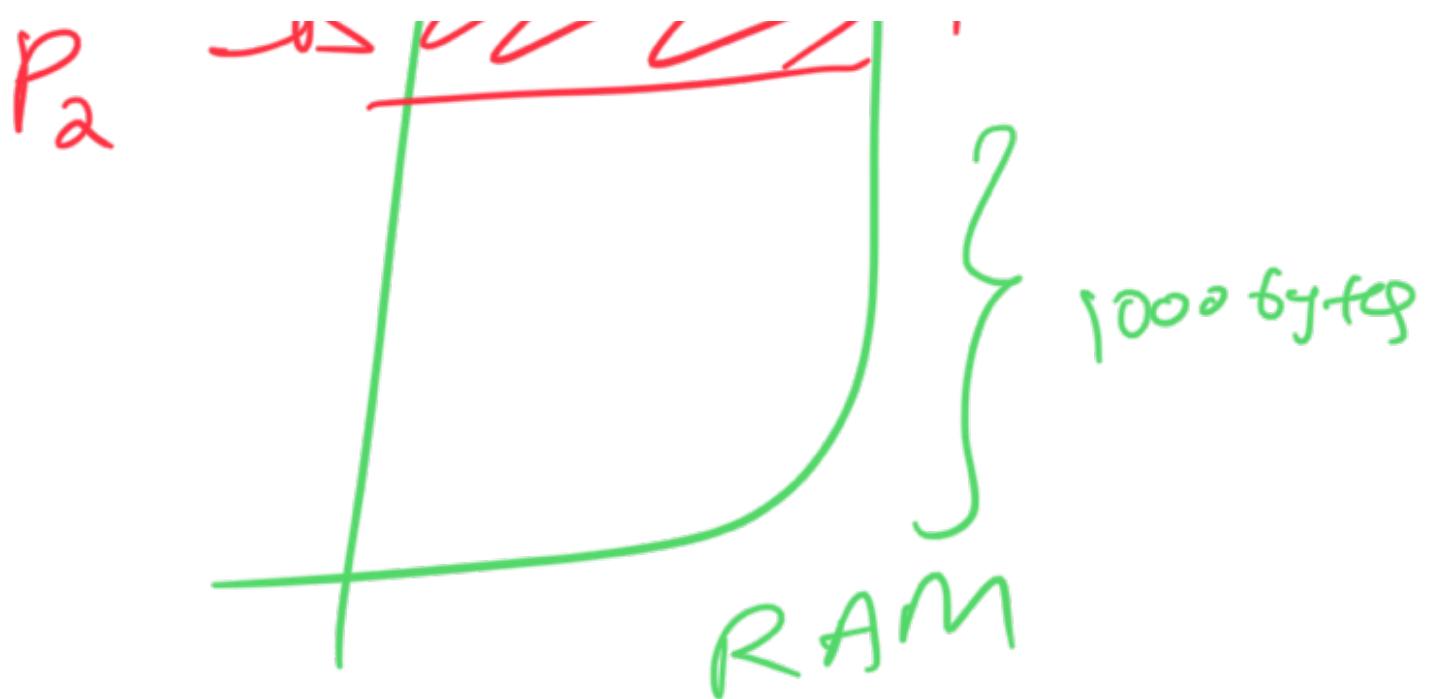
RAM



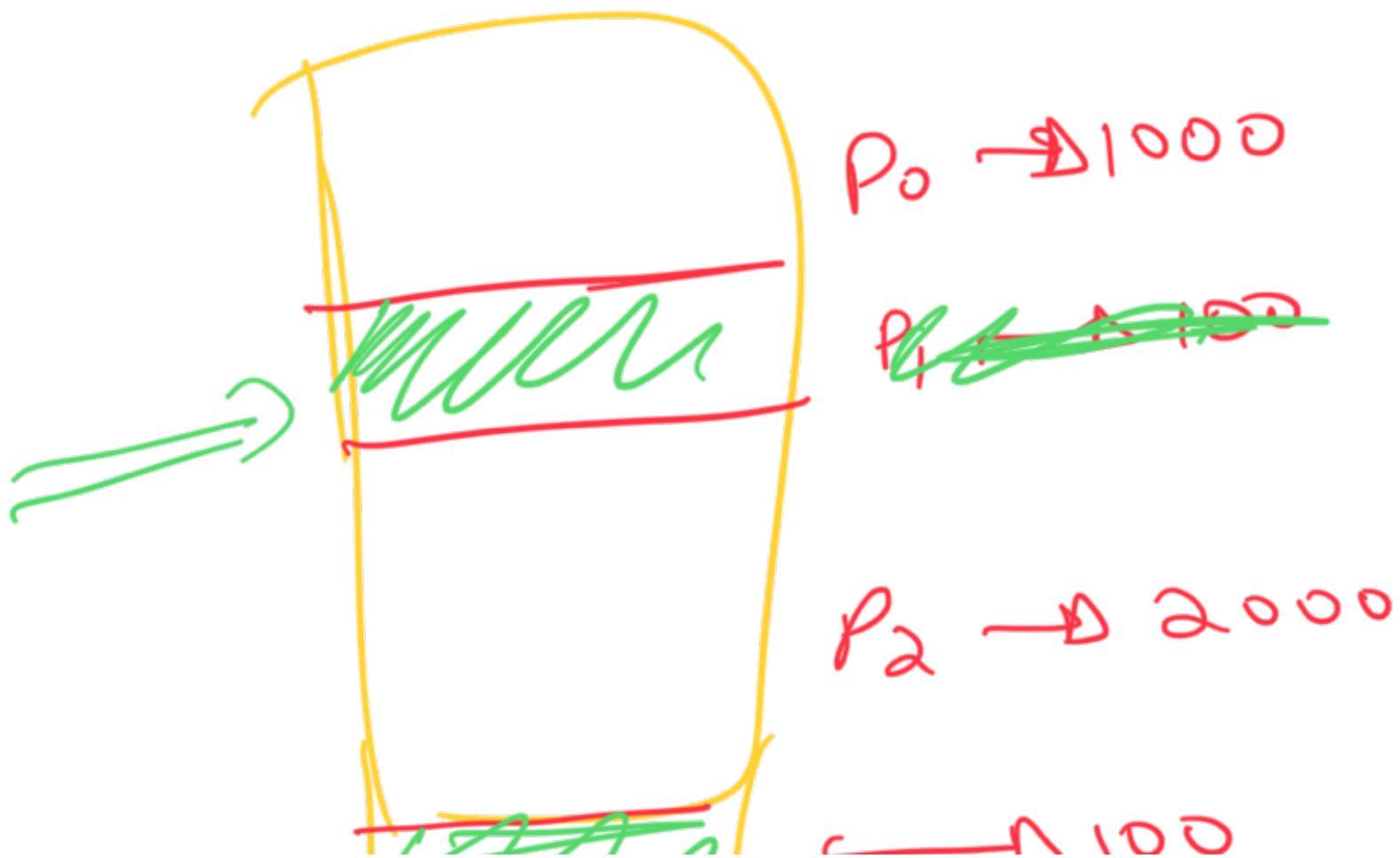
P_1

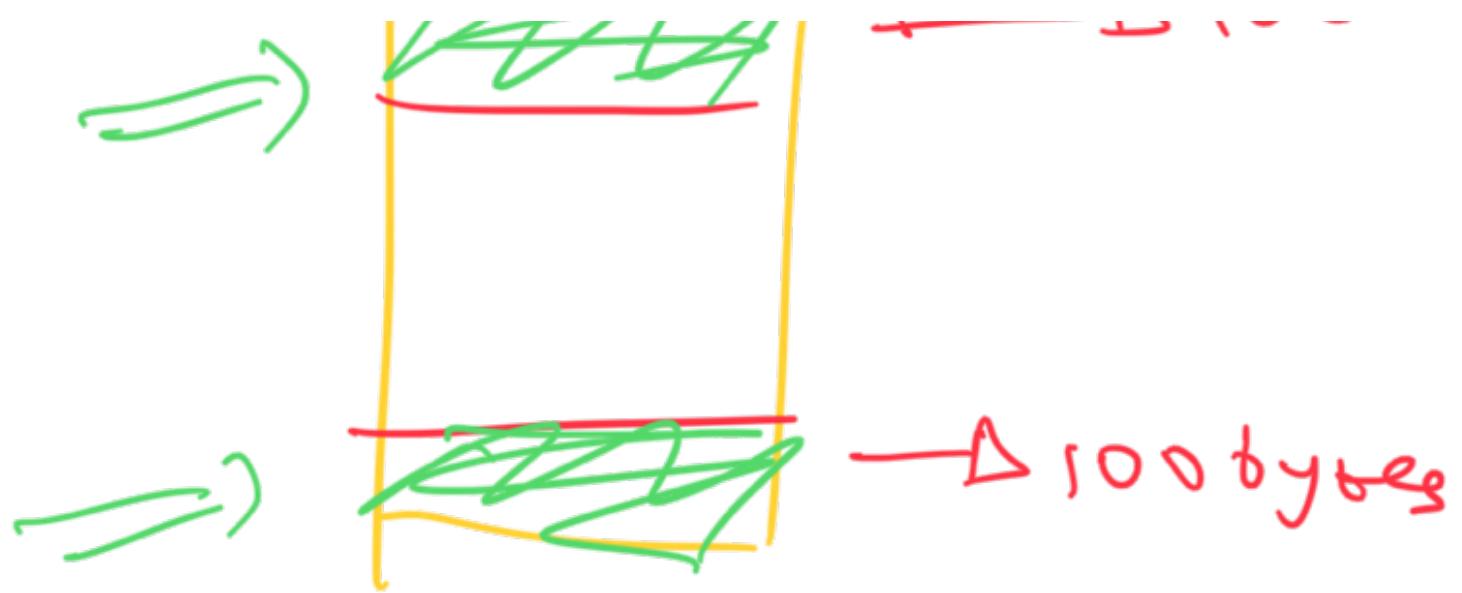
\equiv

1100 bytes.

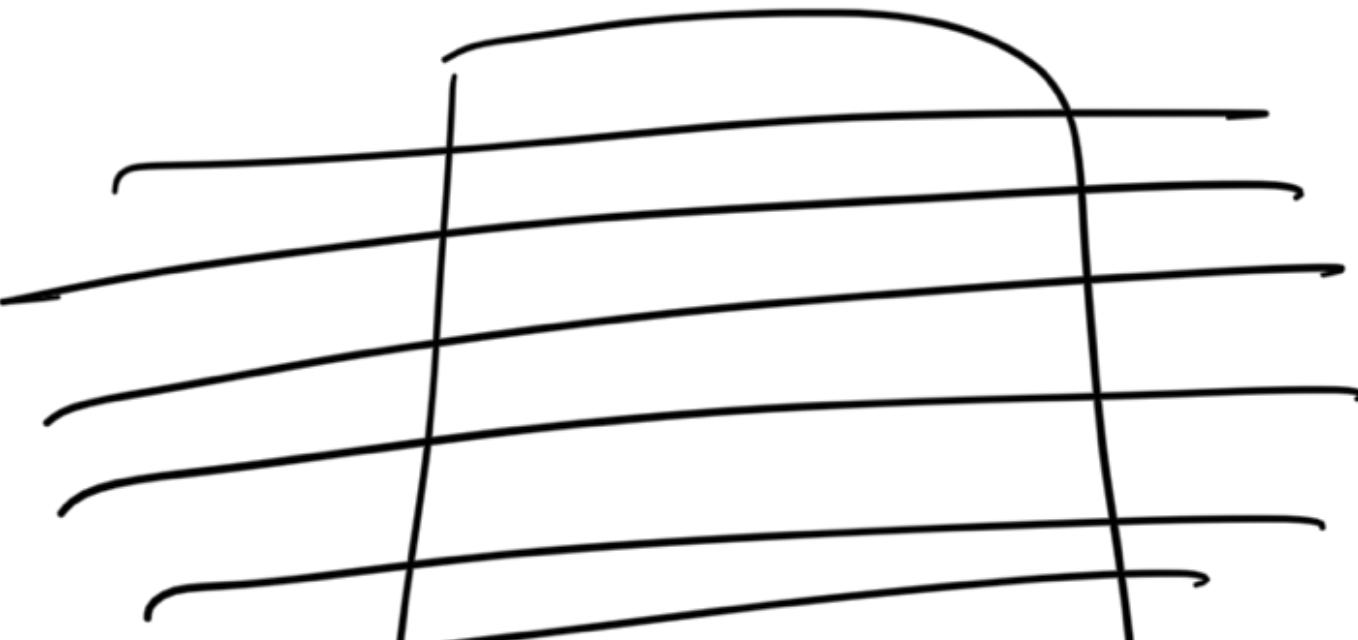
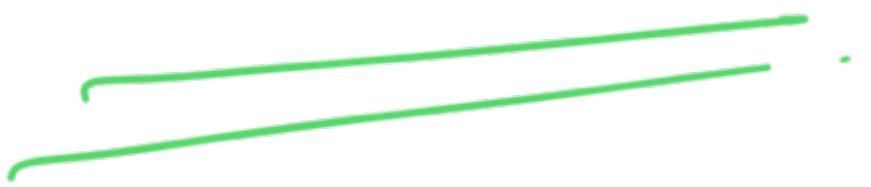


12000'



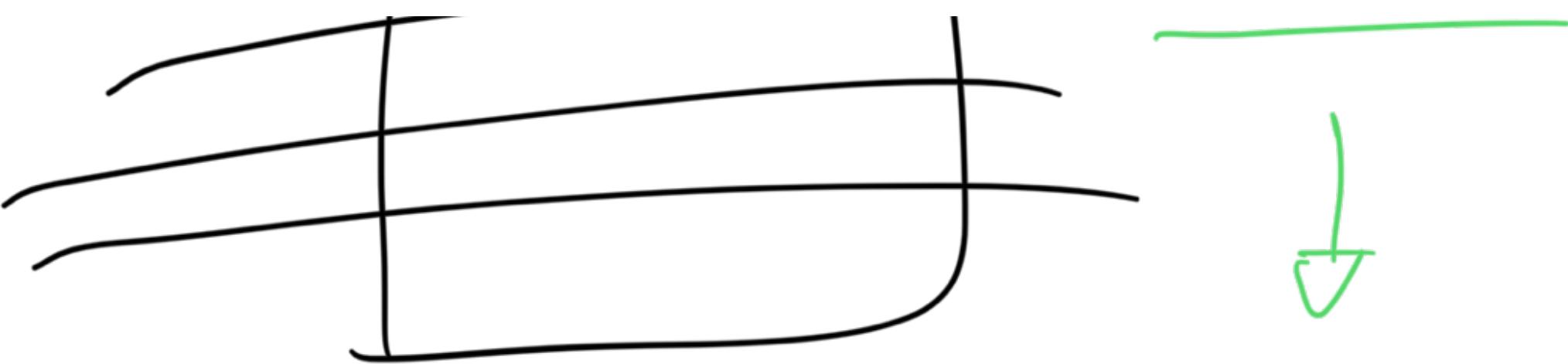


Actual solⁿ



8 GB

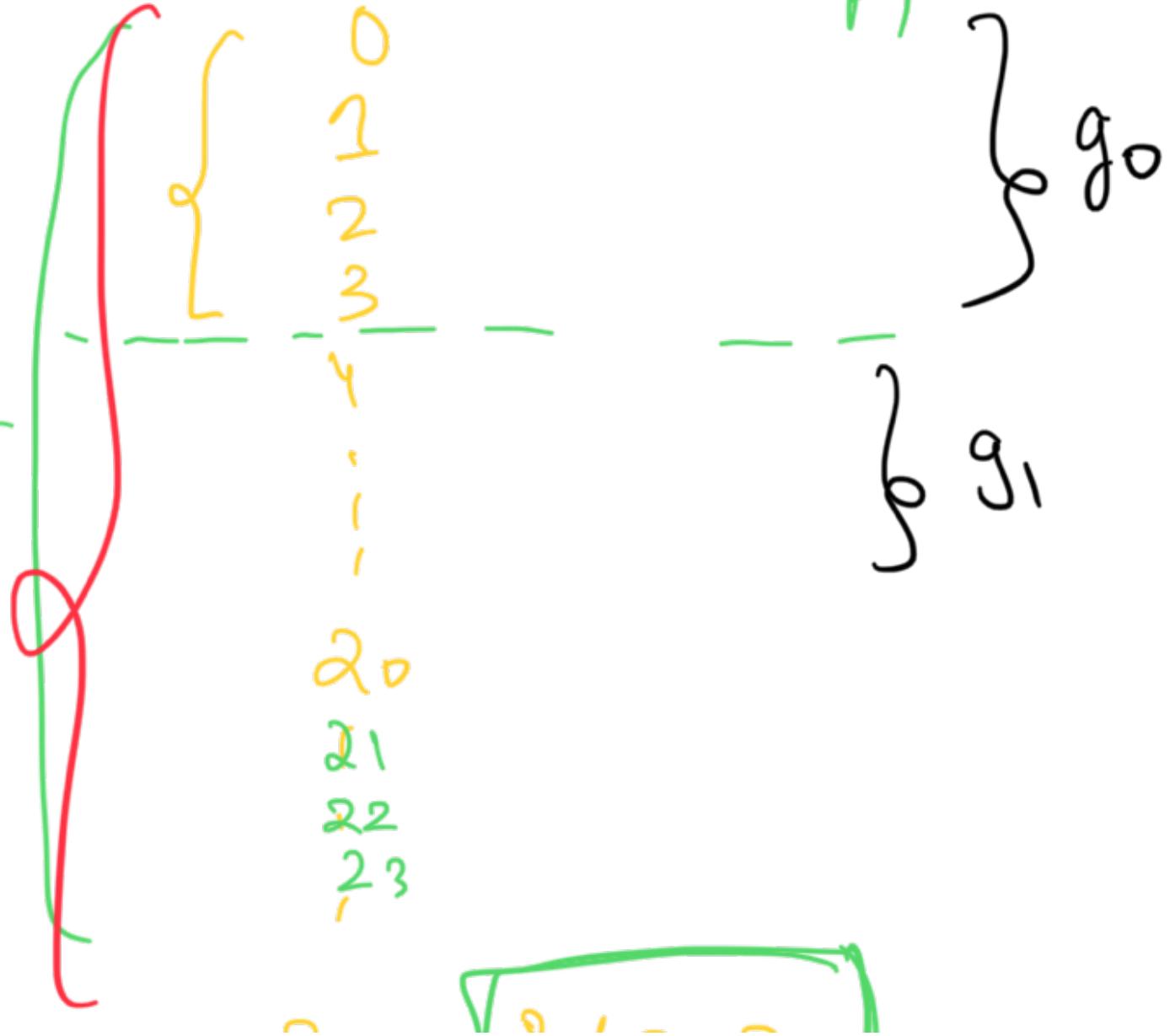
1 FB

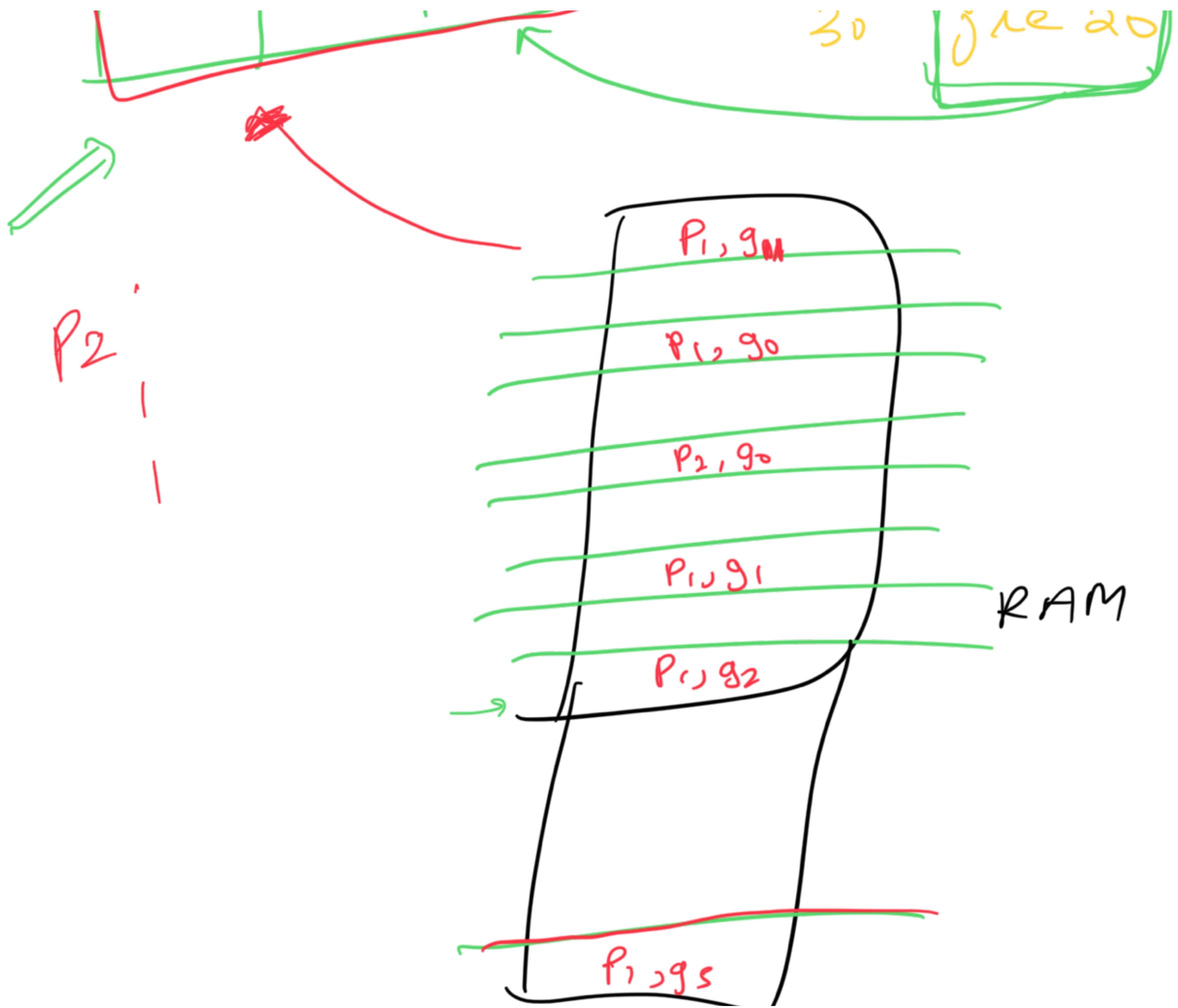


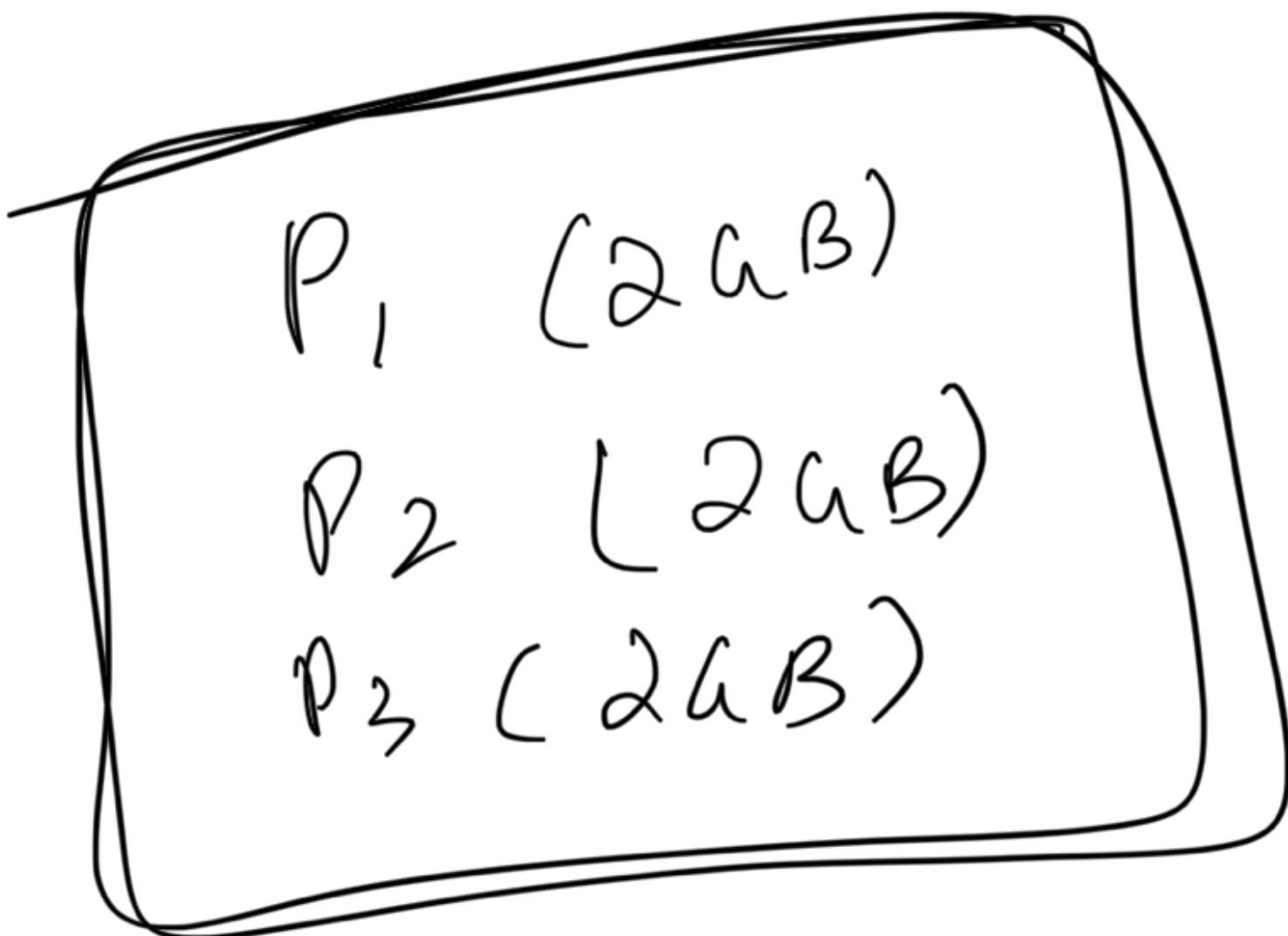
8 million pages.

Process Page Table

Process	Page	Physical
P ₁	g ₀	0af
P ₁	g ₁	b _{c7}
P ₂	g ₀	e _{f3}



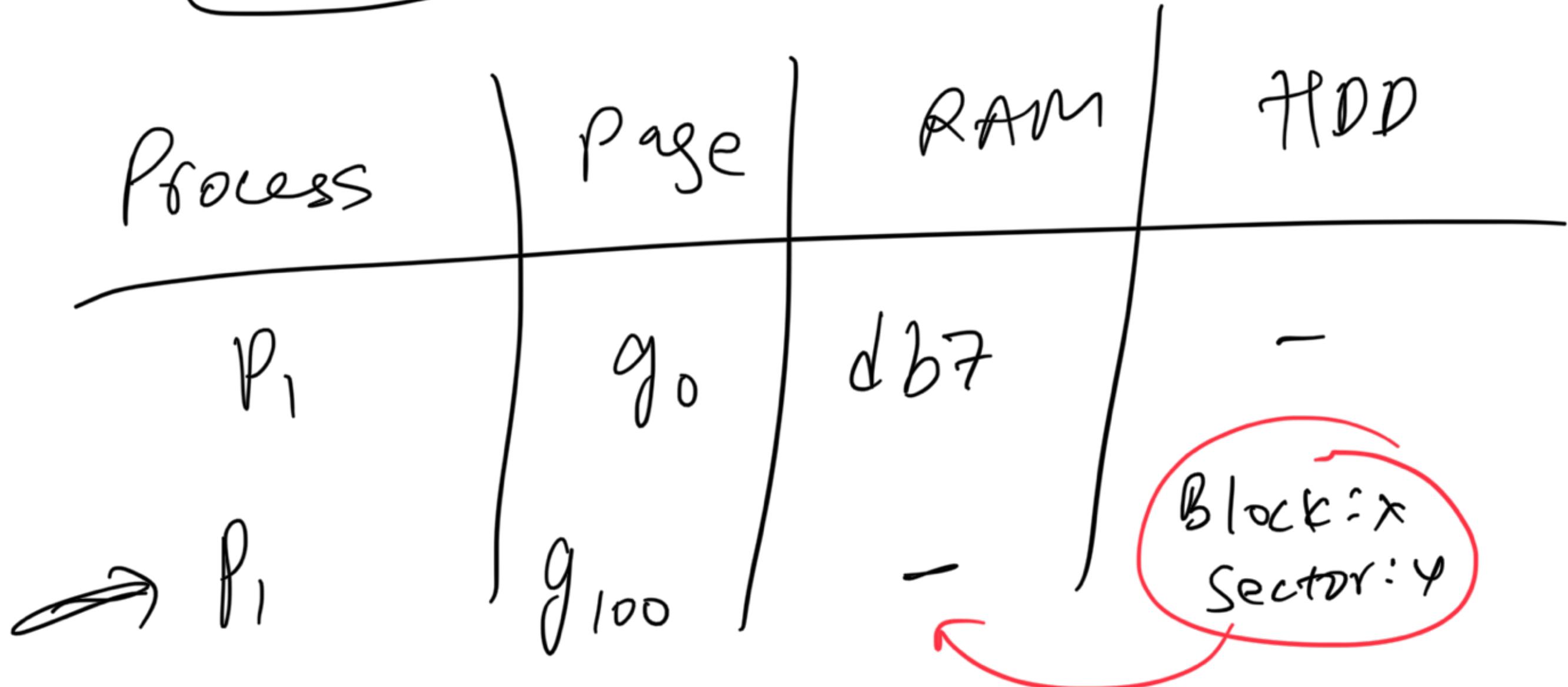




4GB RAM

100+

UTP U



✓ v_i $a_{1..n}$ $f_{1..D}$

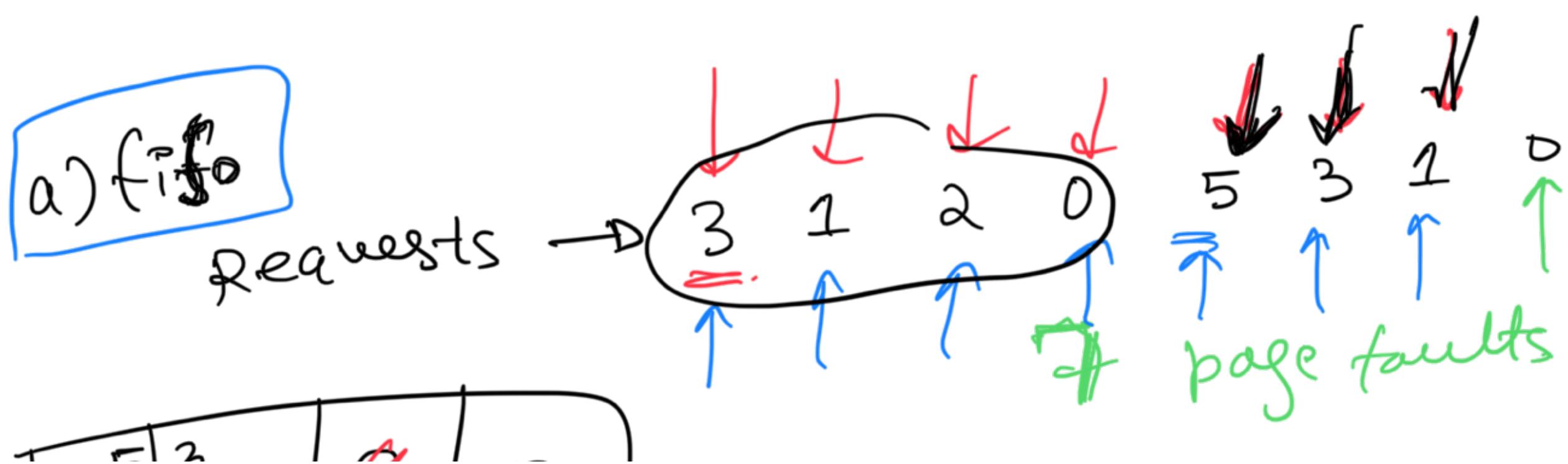


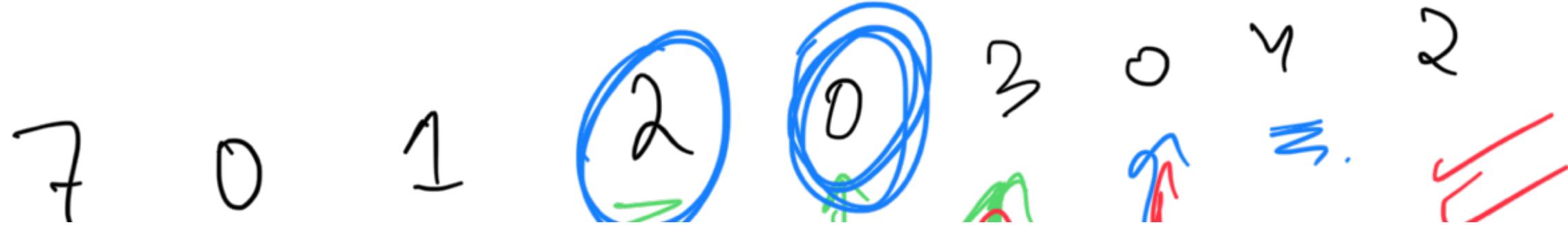
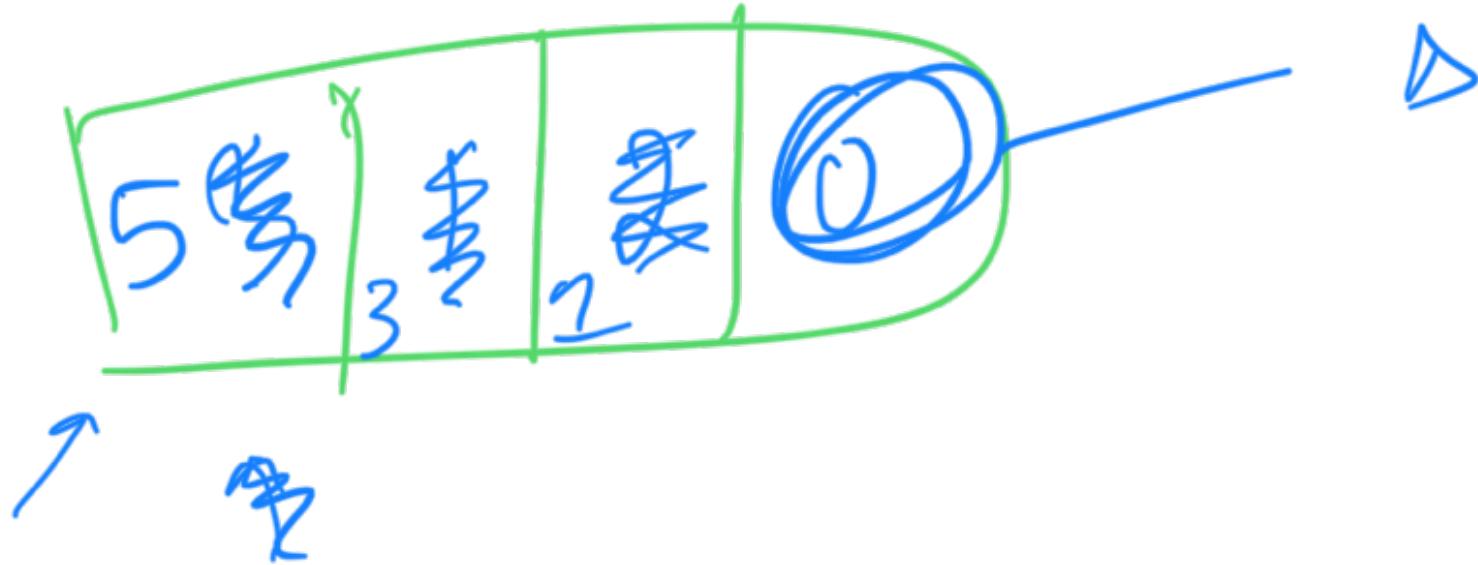
Paging Algorithms

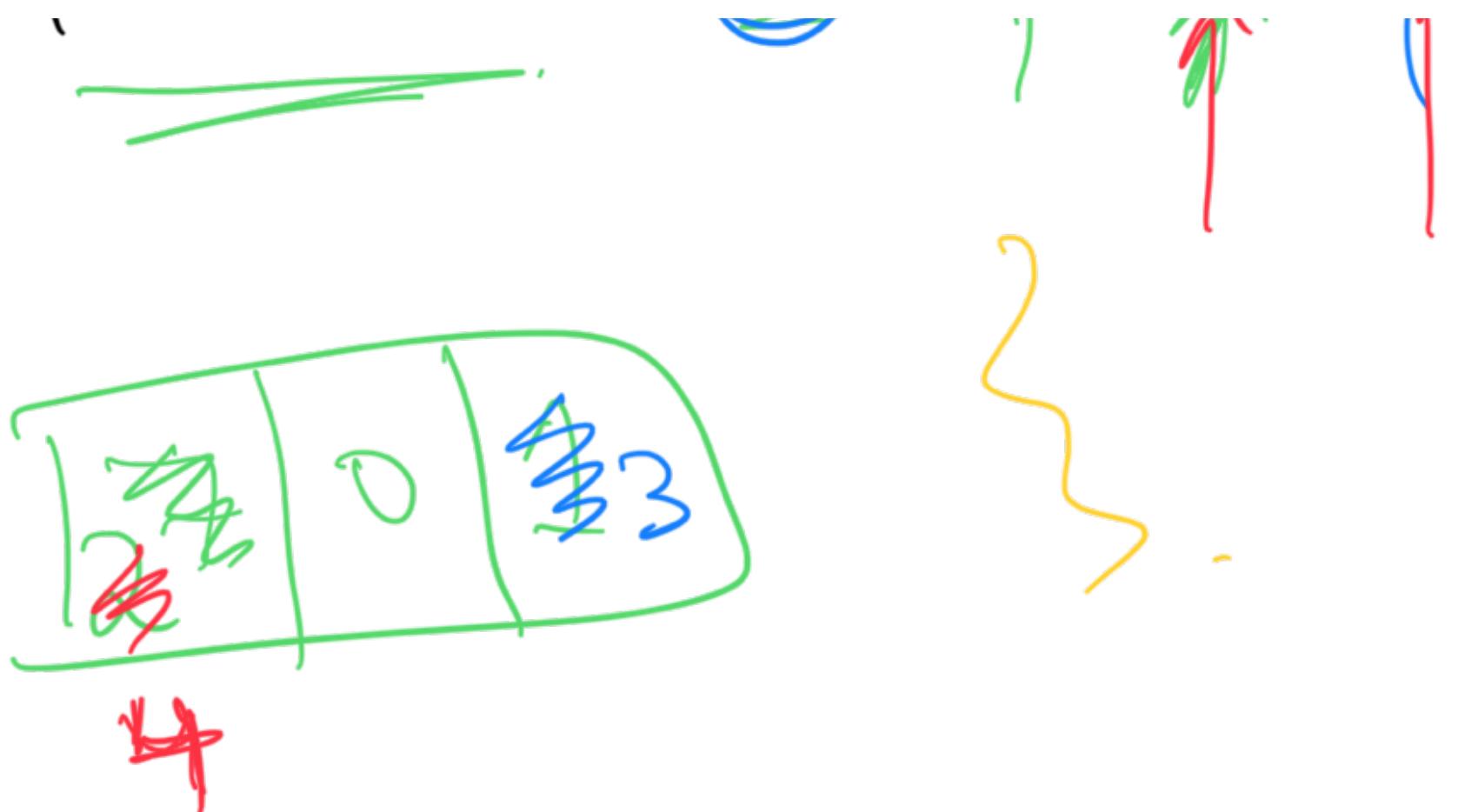
→ optimise:- min. the need to read stuff from hard disk.

⇒ This is called a page fault.

MIN (Page fault)







DS /A190

OP MIN (page faults)

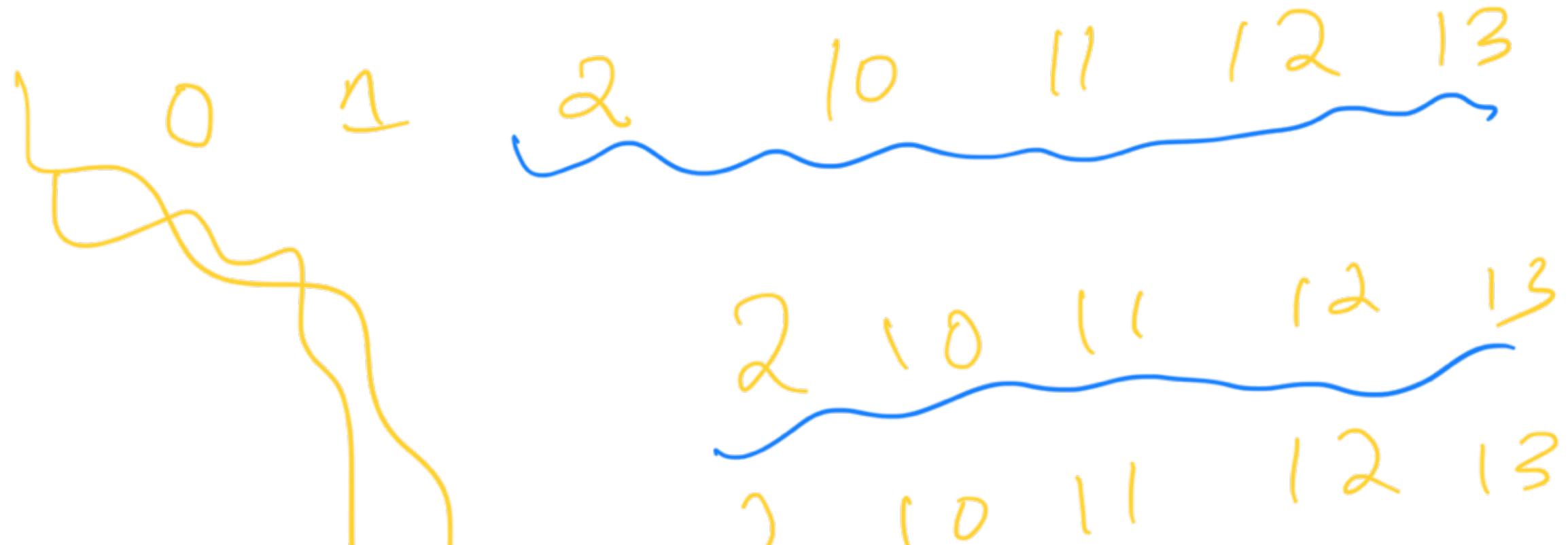
Requests -

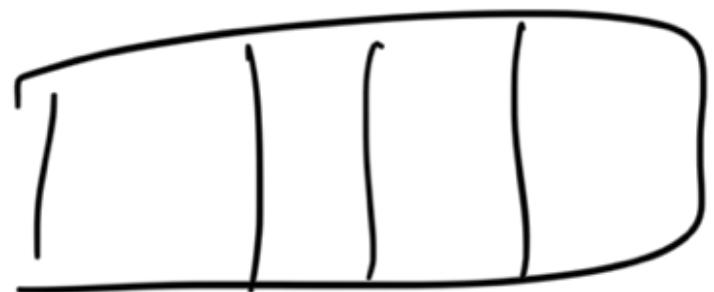
x_1 x_2 x_3 x_4 x_5 \dots



Optimal

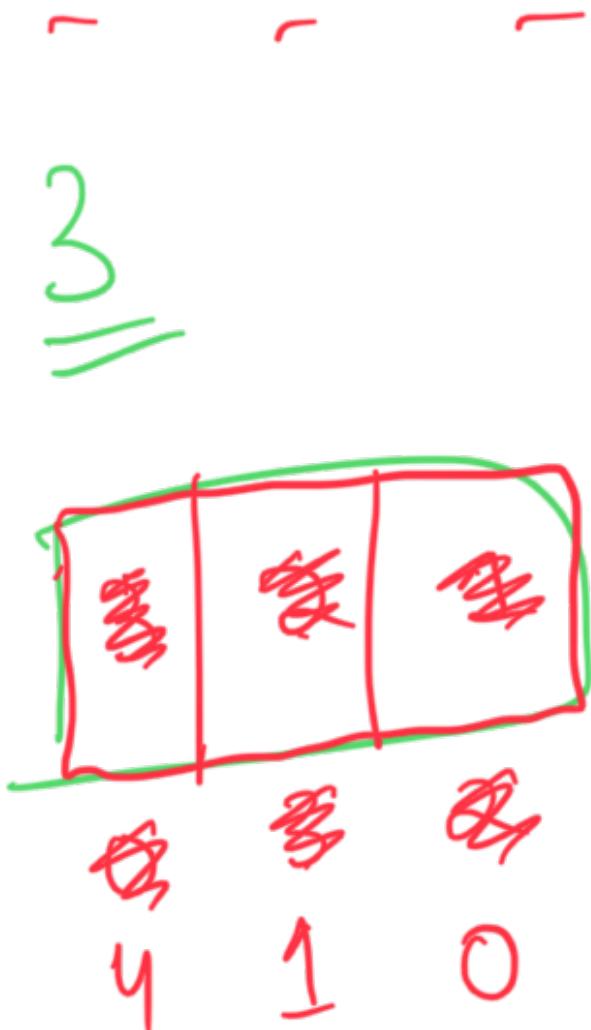
LRU





FIFO

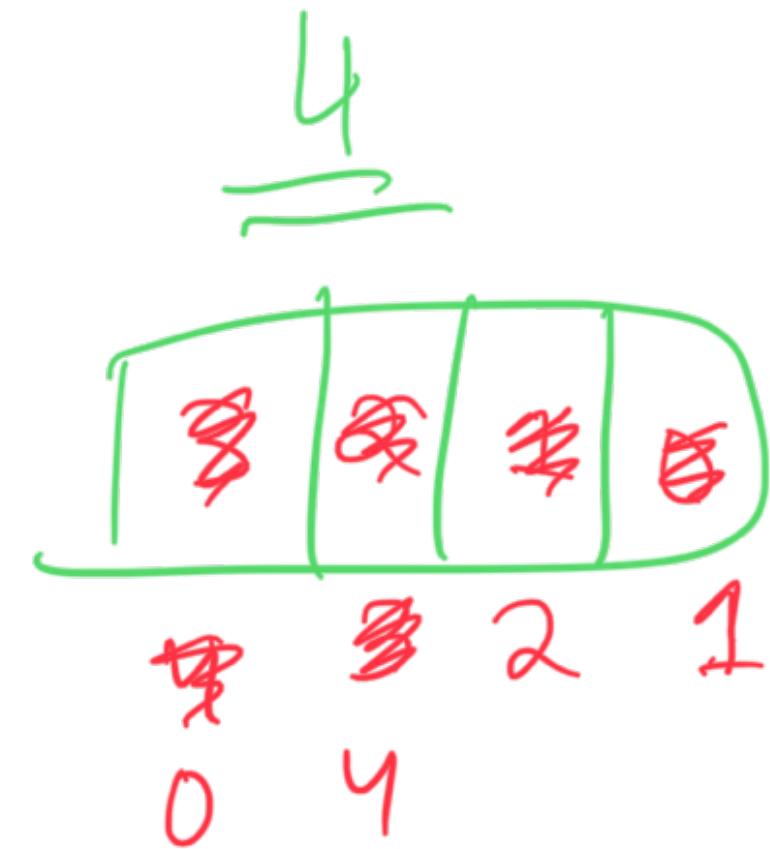
3	2	1	0	3	2	4	3	2	1	0	4
↑	↑	↑	↓	×	×	↑	↑	↑	↑	↑	↑



9

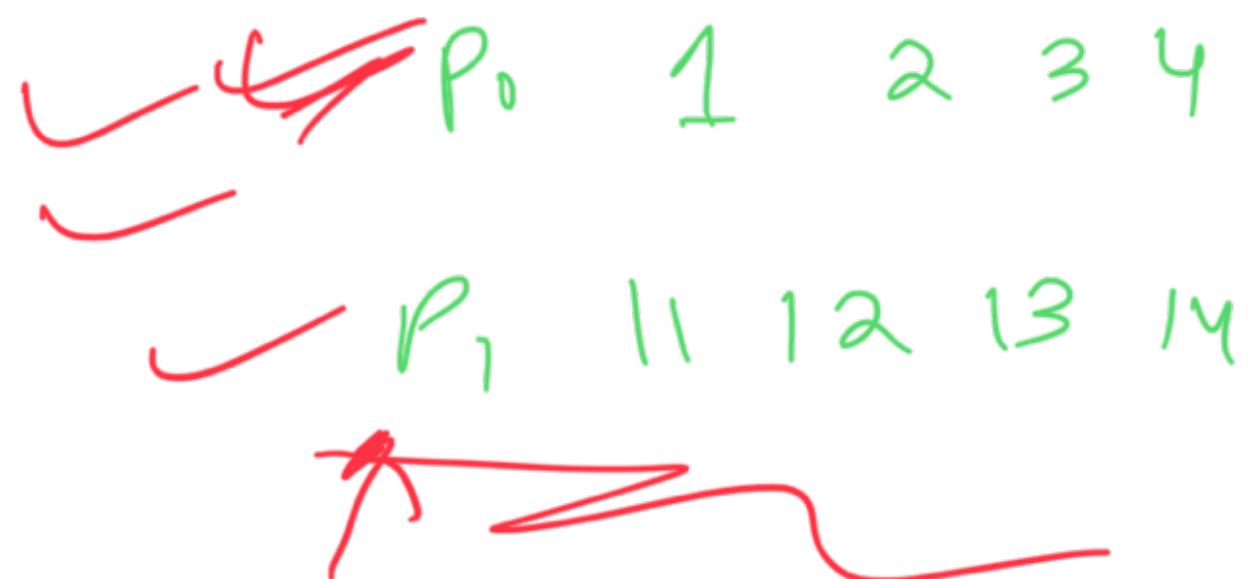
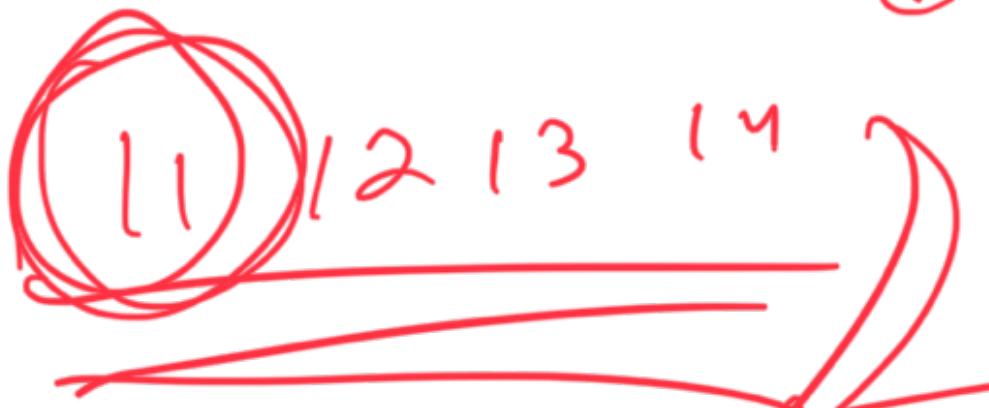
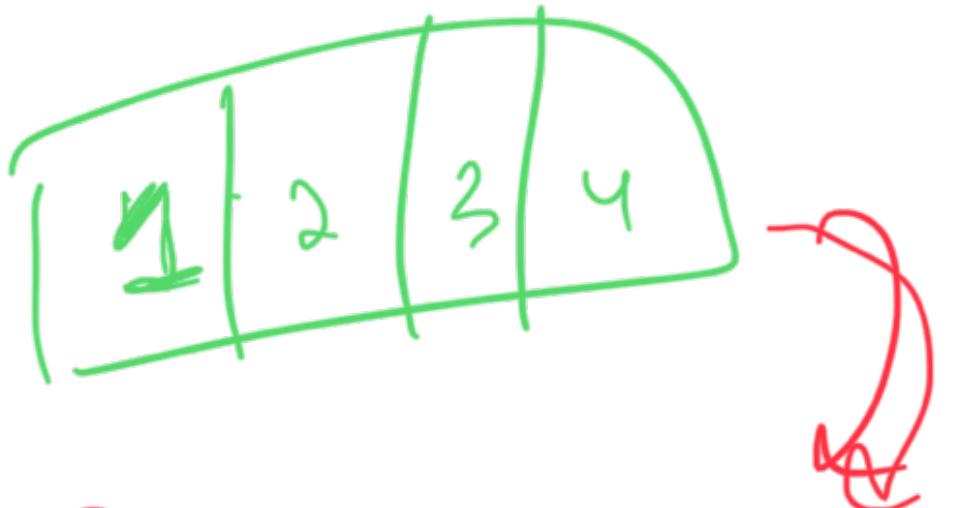
d R U

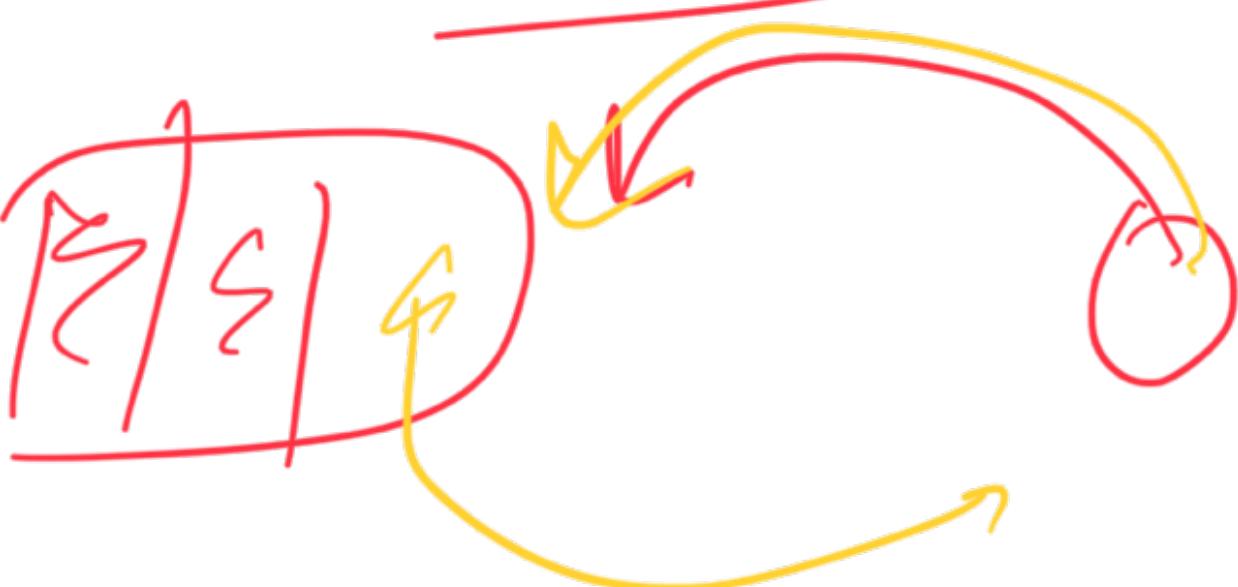
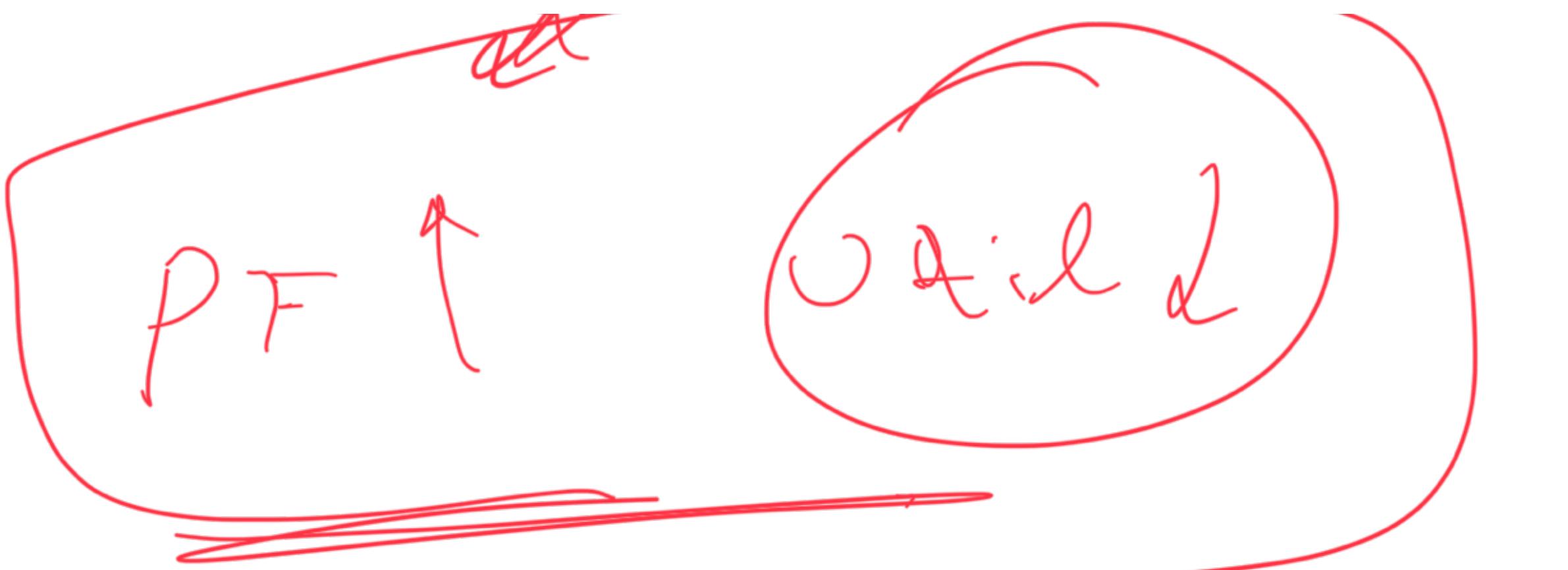
D



10

* Thrashing





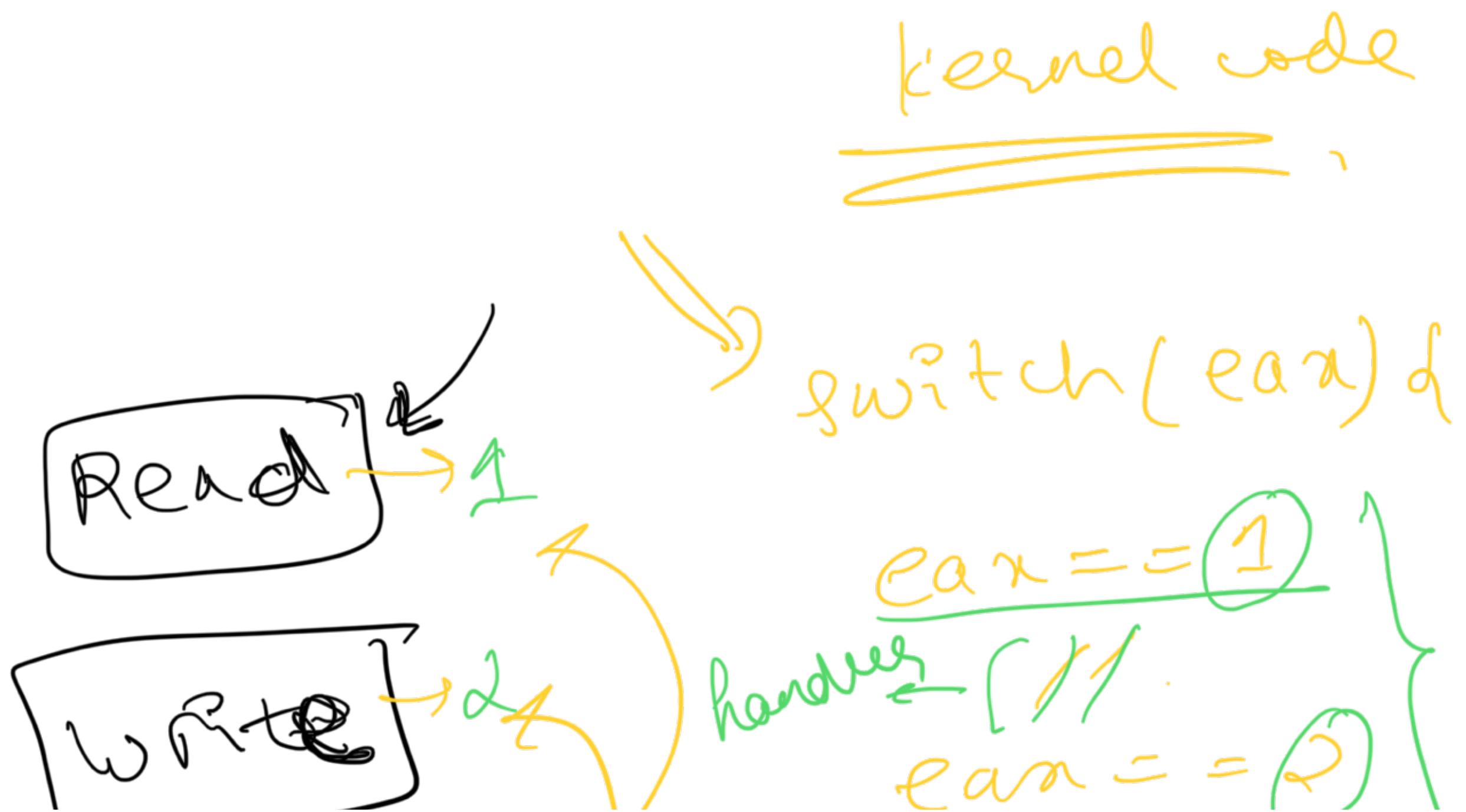
X — X — X

RAM

Privileged <



TAR LSTAR → kernel address



scanf

printf

3

1

}

21

..

)

mov eax, 1

syscall

↓ Interrupt
CPU stop
executing

Restore CPU returning
state

go to kernel mode

↓
executes interrupt handler, save state of the ..