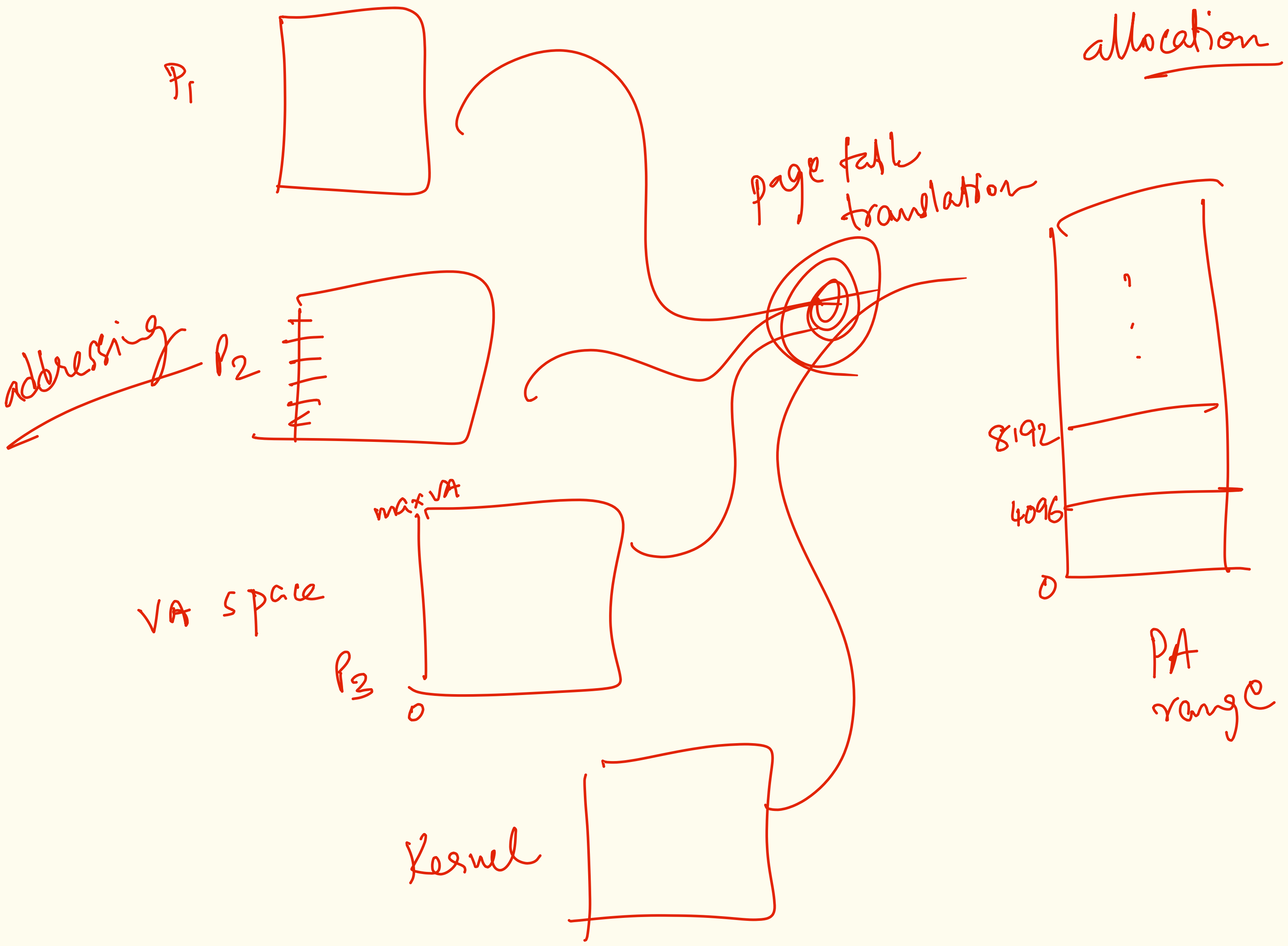
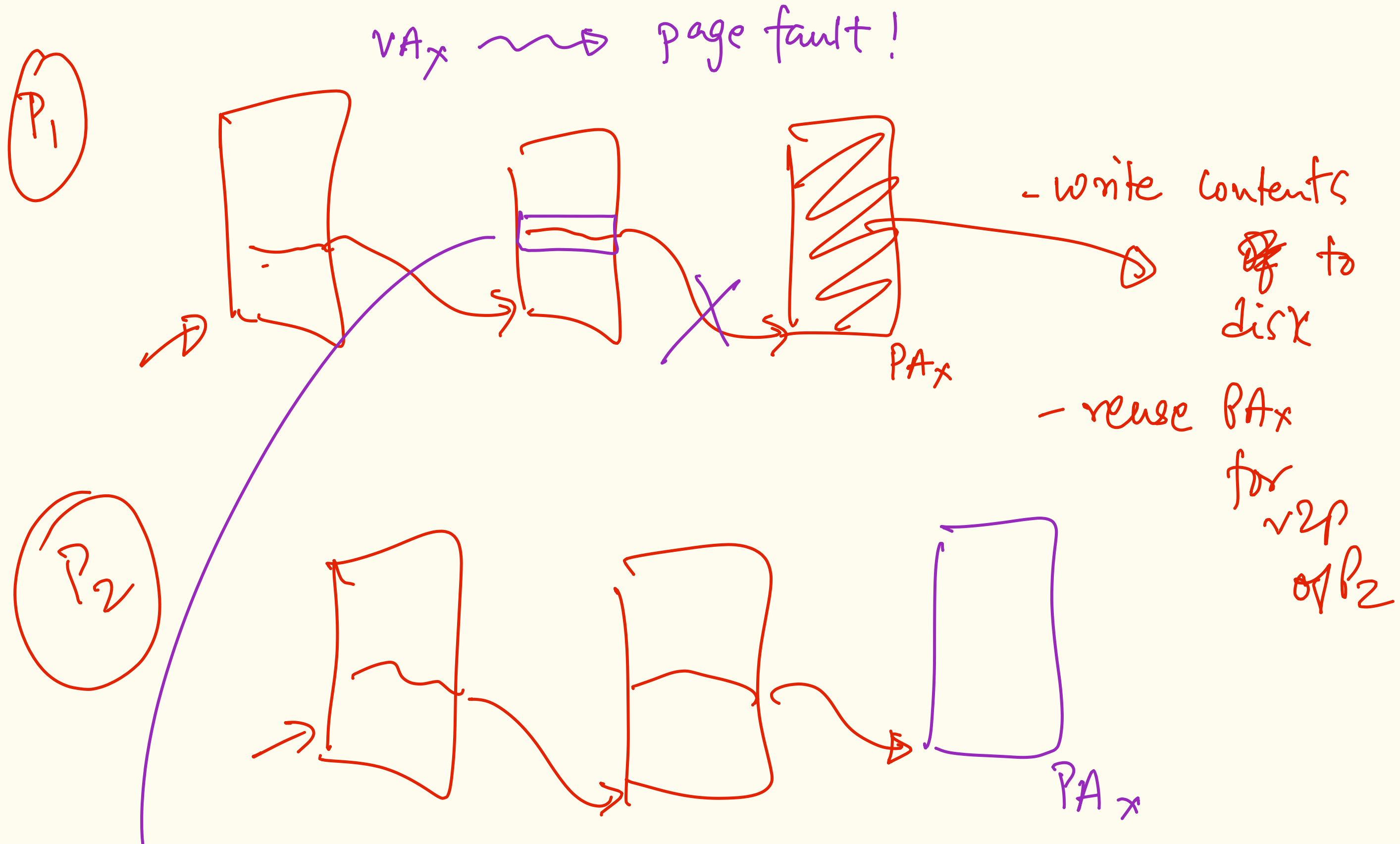
CS219 Lecture 19.

demand paging /swapping



~ if no more / very less free PA pages

- copy/ send some to (swap) disk
- ~~go~~ copied page now is a "free" page
- can be reused for some other ~~B~~ V2P mapping.



- write contents ~~of~~ to disk

- reuse PAx for v2p of P2

pte:

valid	present	
V	P	
0	0	→ no v2p mapping in page table for offset of VA.
1	0	→ valid mapping but mapping not in memory
0	1	→ invalid
1	1	→ all good check permissions for access

swapped contents to disk.

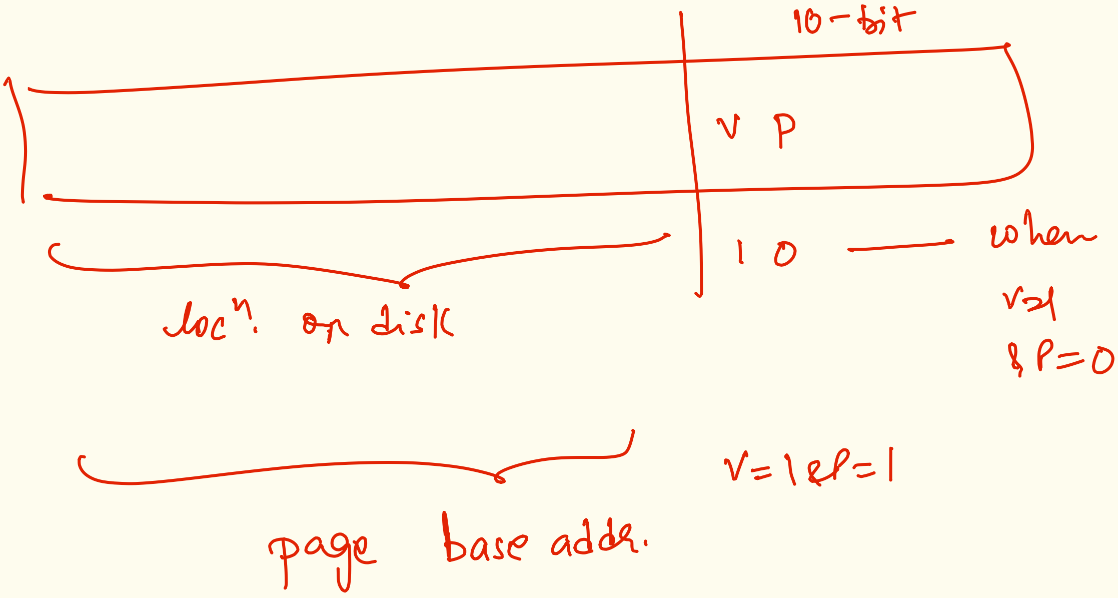
- pagefault w/ v=1 & P=0 is diff. from v=0 & P=0

rides on free bits of PTE

needs to find content from disk

- find a free page
- copy content to free page
- update pagetable to point to free page
  - set pte flags v=1 & P=1

pte:



pte flags:

D ~ dirty bit — on write to page updated

A — accessed bit

set on read by mmu

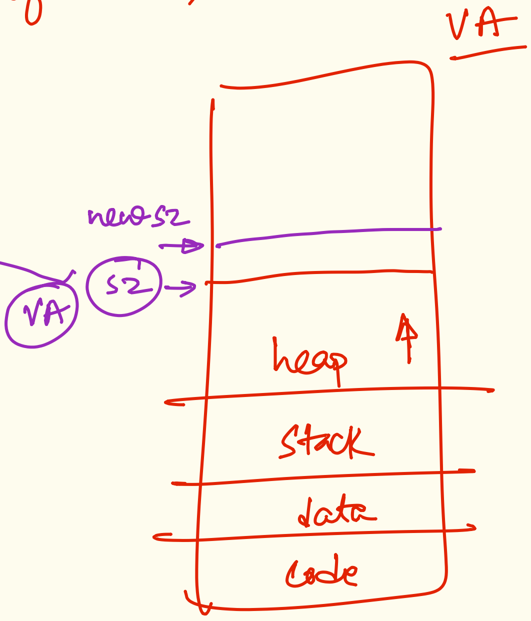
malloc & free

int * p = malloc (210 * sizeof int);

*p = 23;

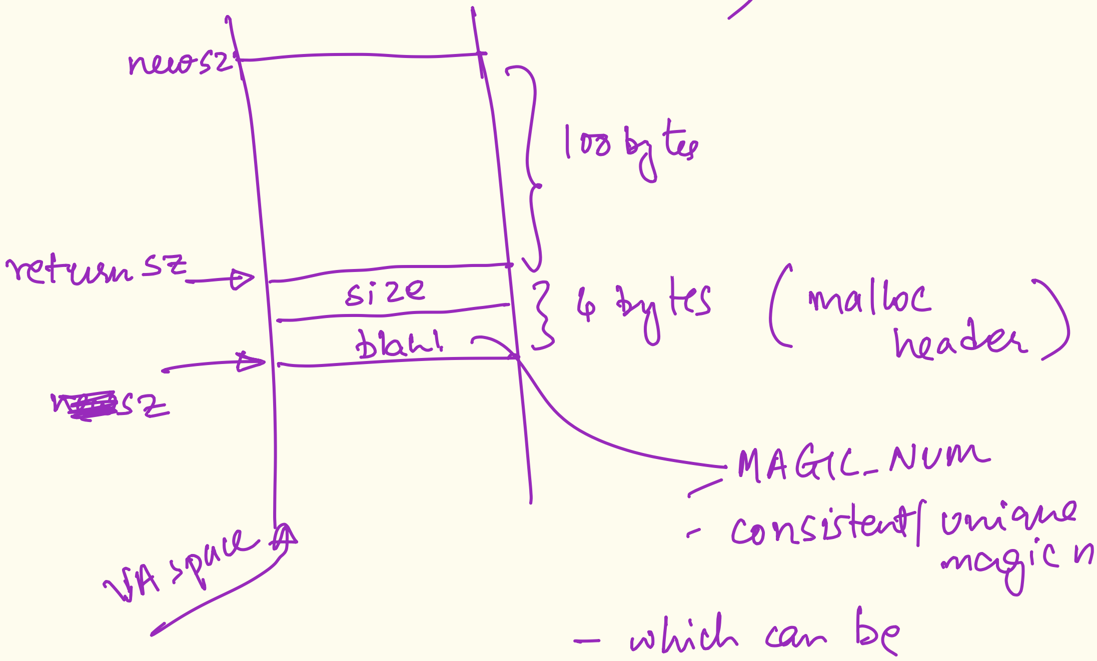
free(p + 27);

p - 2027



free(p) ← reset newsz back to sz

— malloc (100) ~ sbrk (104) ↙ system call



MAGIC_NUM

- consistent/ unique magic num

- which can be read to validate free.

*(p-2) = 1e6;