CSE 330: Operating Systems

Class: 20 **Date:** 11/1

Fall 2016

Note Title

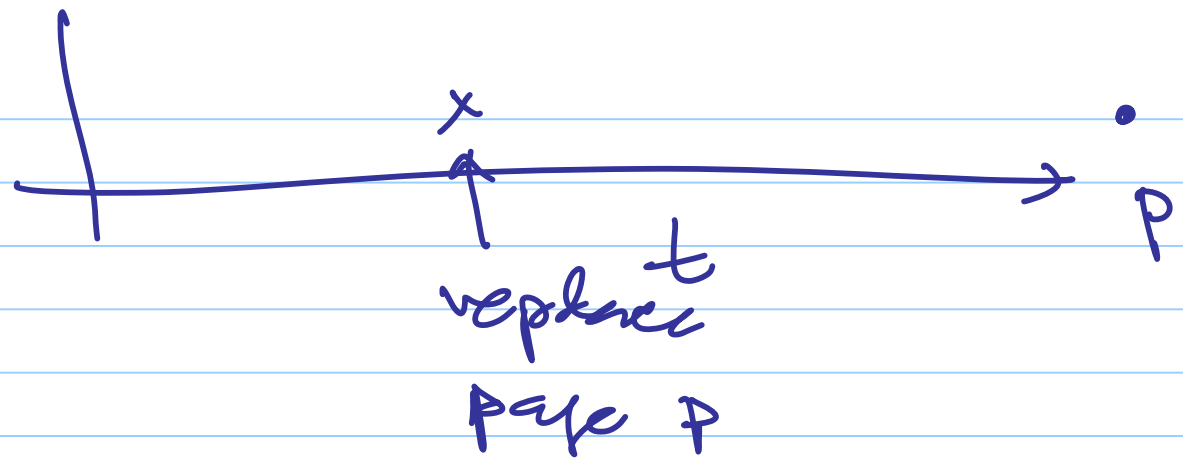
FIFO page replacement

→ Belady's anomaly

Best page replacement algo

- Optimal (OPT)

• replace the page that will not be used for the longest time in the future


x
p
t
vzdálenost
bodu P

OPT → useless ?

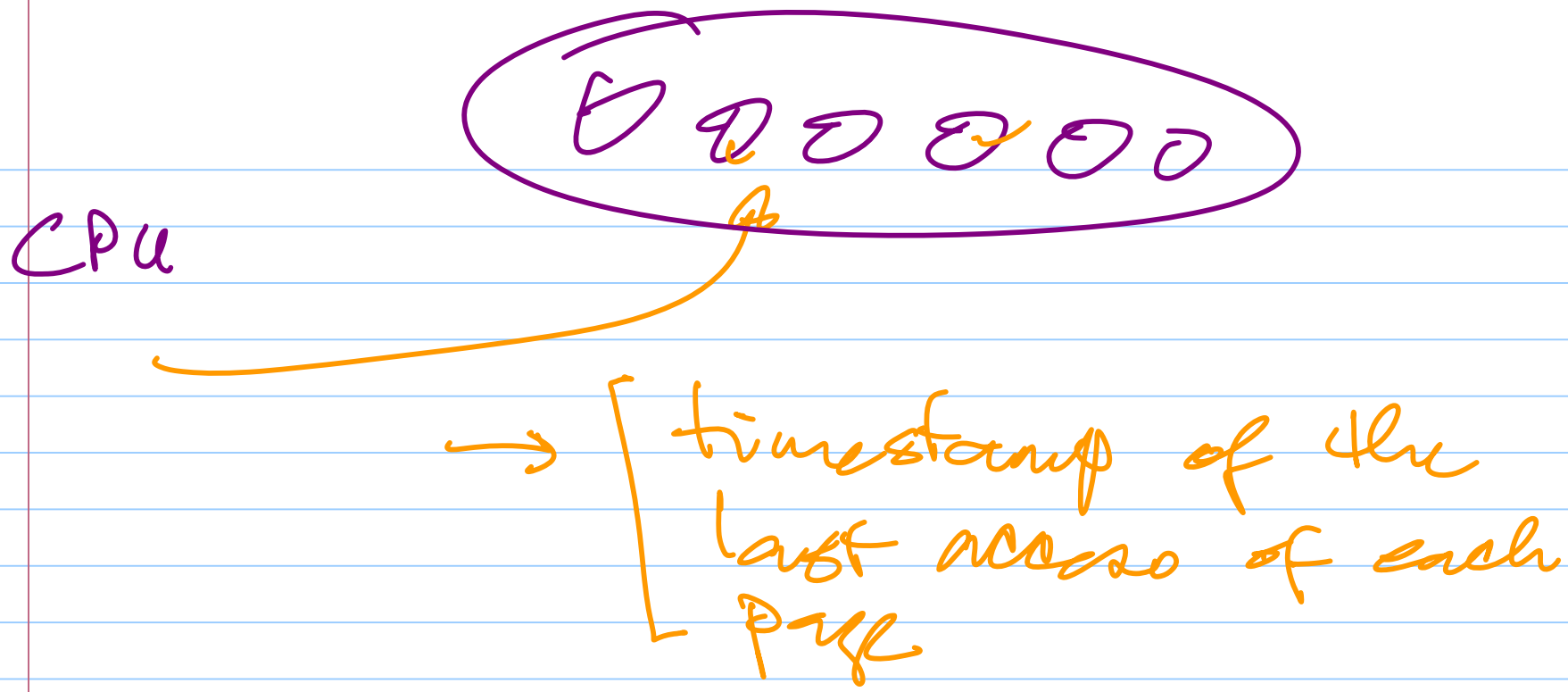
→ NO → it sets the lower bound

LRU

replace the page that was not used for the longest time in the past

⇨ past predicts the future...,

→ NOT IMPLEMENTABLE

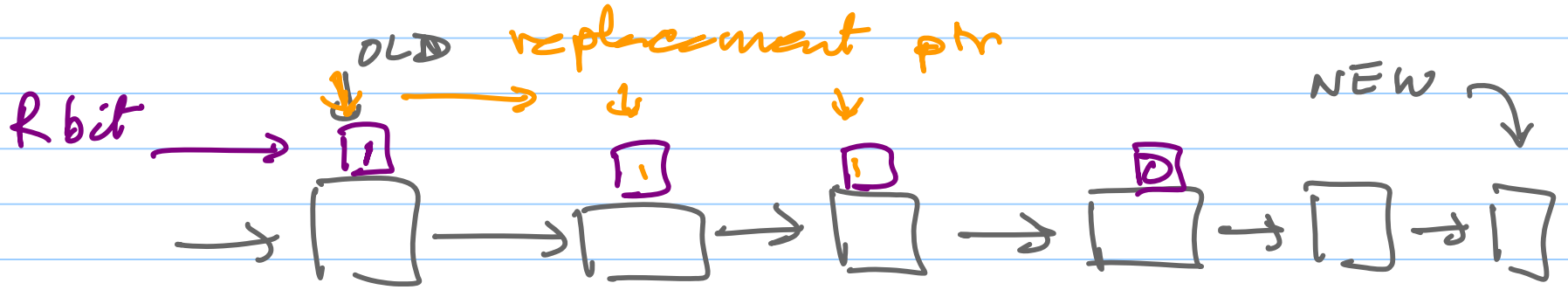

CPU
timestamp of the last access of each page

practical solutions

- use FIFO but modify the order

- LRU approximations

Second Chance replacement



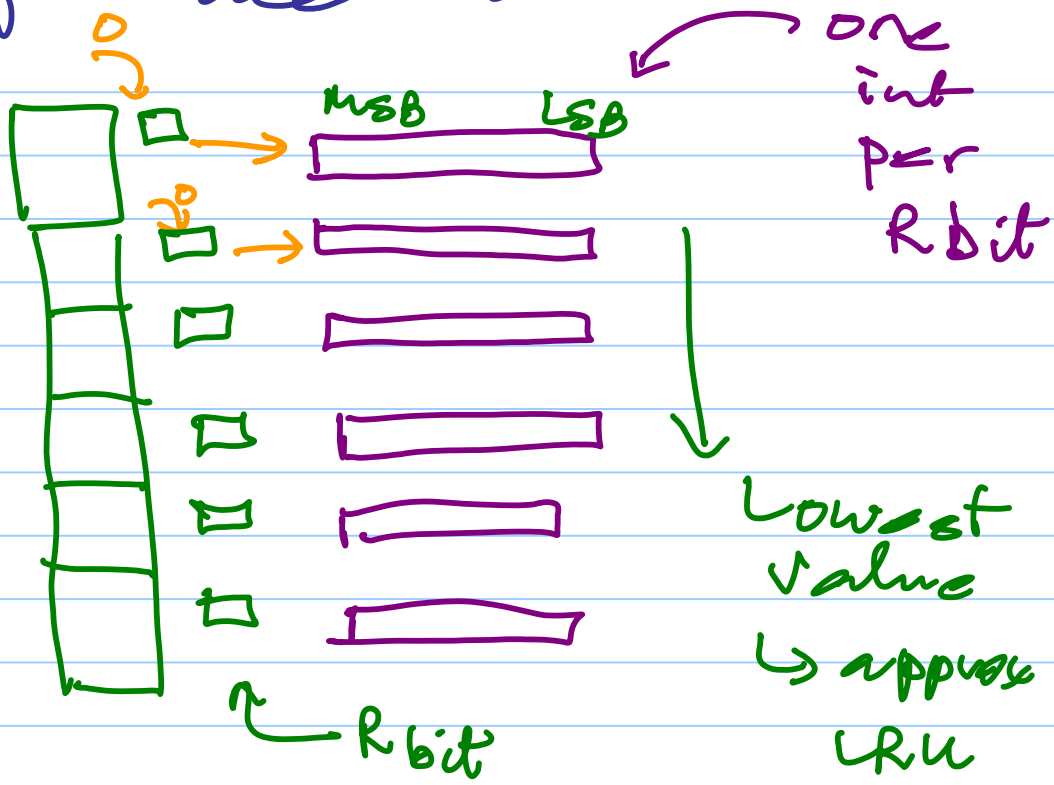
FIFO Q of pages that are in memory

REF bit

Additional reference bits

① At time intervals shift the R bit to the integer

② shift 0 into R bit



demand paging performance

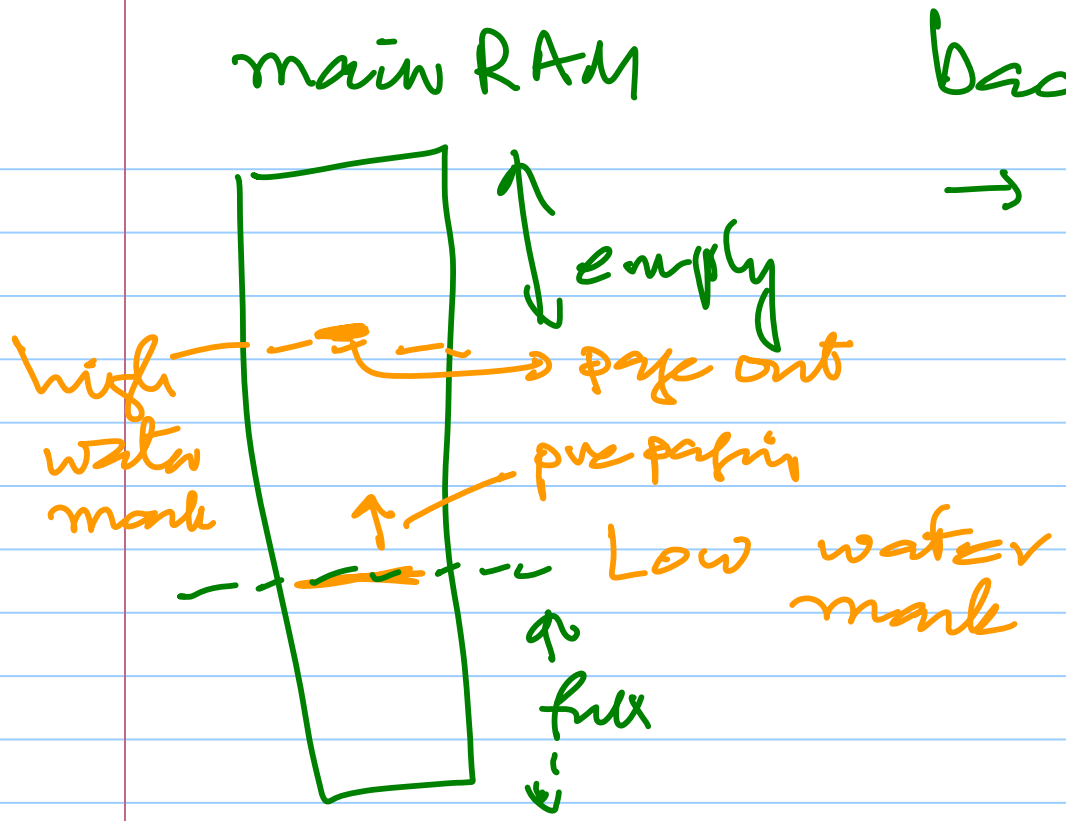
1. page replacement
2. working set
   - also global vs local replacement
3. disk r-w speed

page fault handler

page fault ()
{
find a free frame
→ if not avail,
find victim
→ write out if m bit = 1

disk i/o

3 page in the target page



background process
→ does page outs & prepaging

pre paging

@ program load time

→ main() location → move

→ libraries that are used heavily

→ some data