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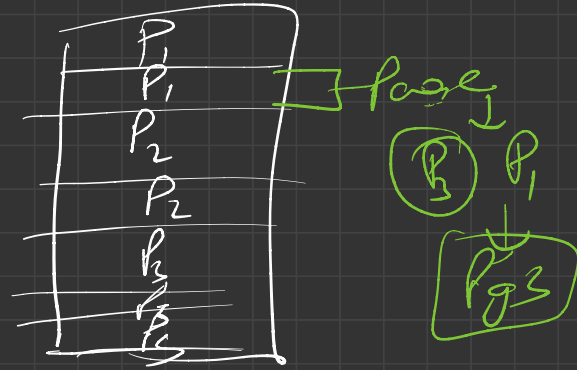


# Lec-29

Page replacement algos:

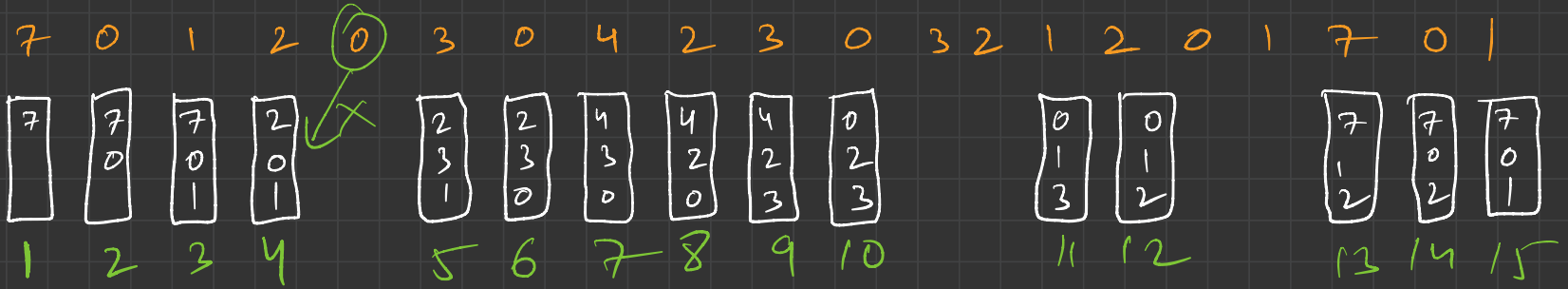
⇒ Page faults??

Page fault service time



① FIFO LRU

→ Ref string →



FIFO → 15 page faults.



# Belady's anomaly in FIFO

Ref: 1 2 3 4 1 2 5 1 2 3 4 5

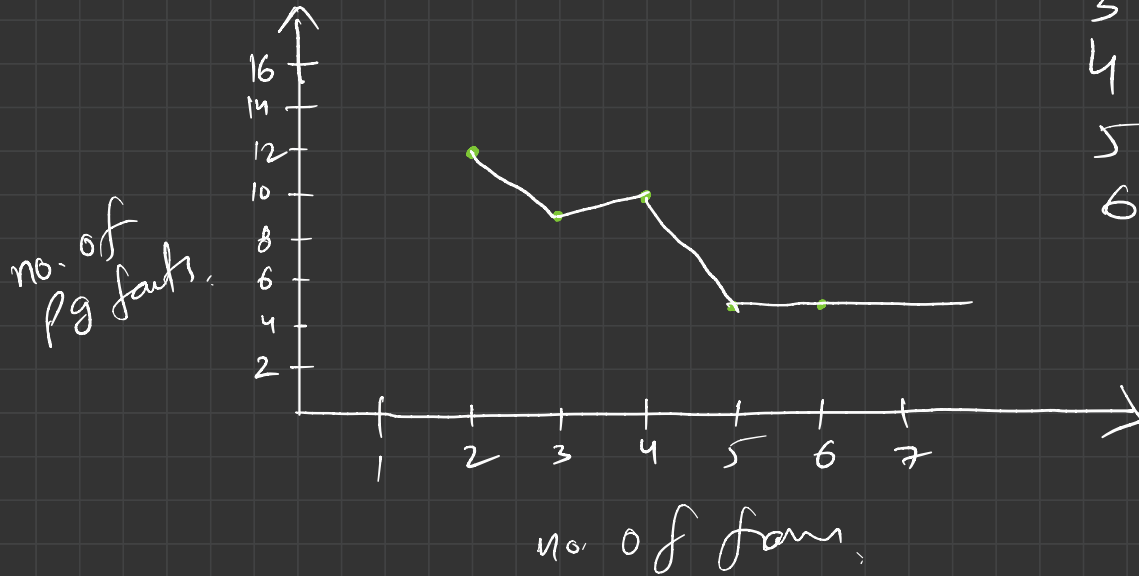
2  $\rightarrow$  12

3  $\rightarrow$  9

4  $\rightarrow$  10

5  $\rightarrow$  5

6  $\rightarrow$  5



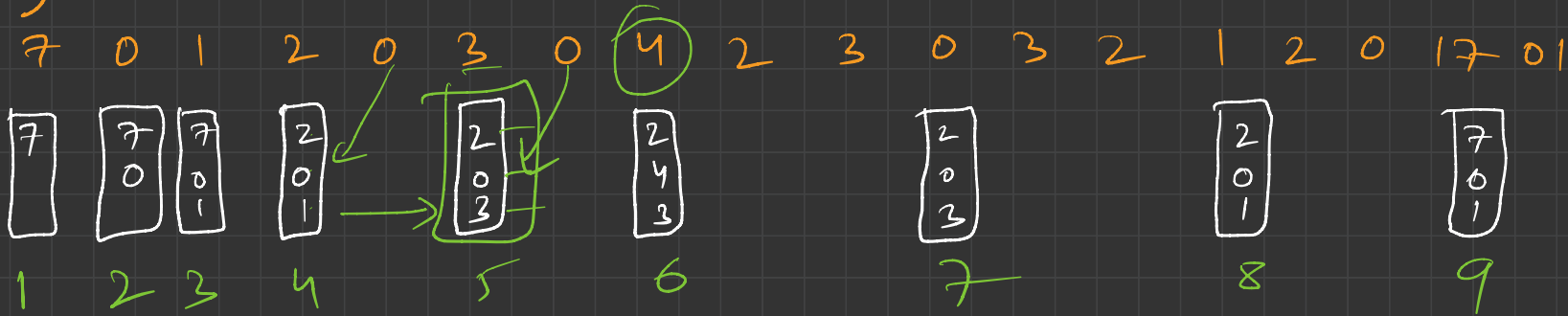
## ② Optimal Page Replacement

→ Best

→ pg. faults minimum

→ almost impossible to implement.

eg.

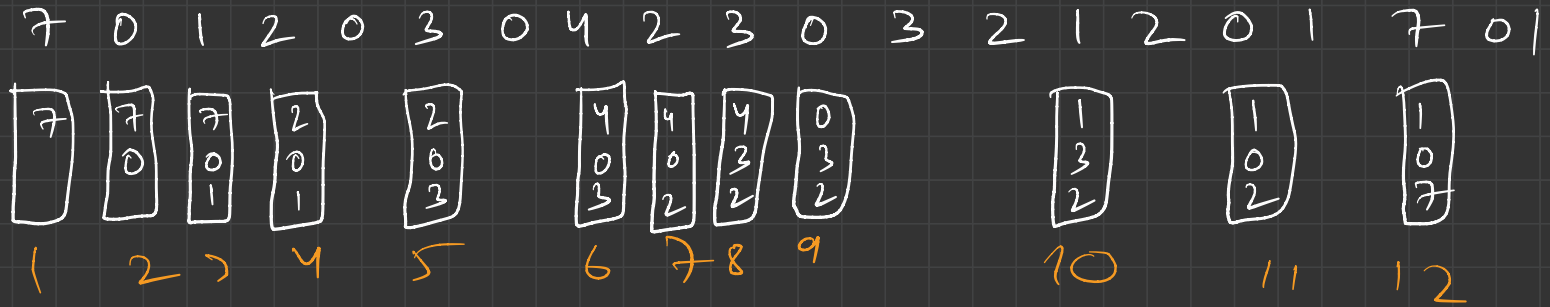


OPR → 9 page faults

③ LRU Least Recently used

→ approximation past based on.

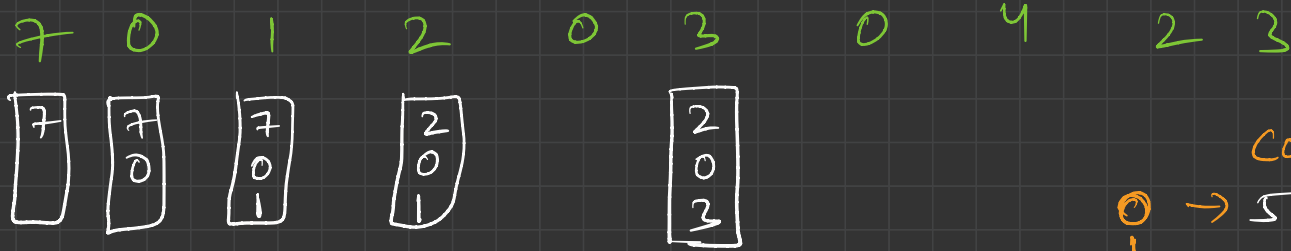
Q →



LRU → 12 pg. fault

LRU implement

① Counter.



Global shared Count variable

LRU implement

Count → universal

0 → 5  
1 →  
2 → 4  
3 → 6  
4 →  
7 →



## ② stack based,

→ 7 0 1 2 0 3 0 4 2 3 — — —

7

7  
0

7  
0  
1

2  
0  
1

2  
0  
3

4  
0  
3

stack →

2  
1  
0

3  
0  
2  
~~2~~

4  
3  
0  
2

4  
0  
3  
2

4  
0  
3