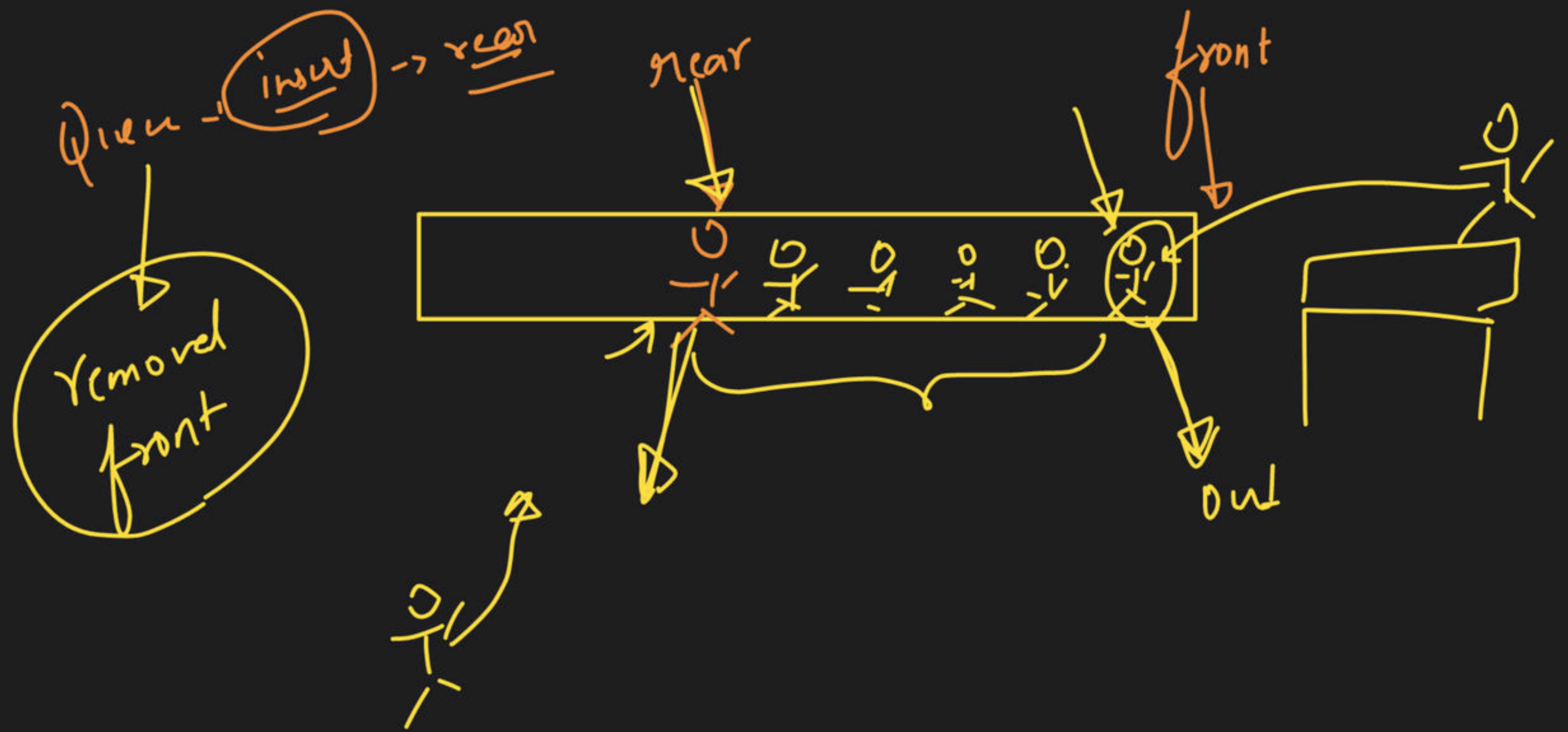
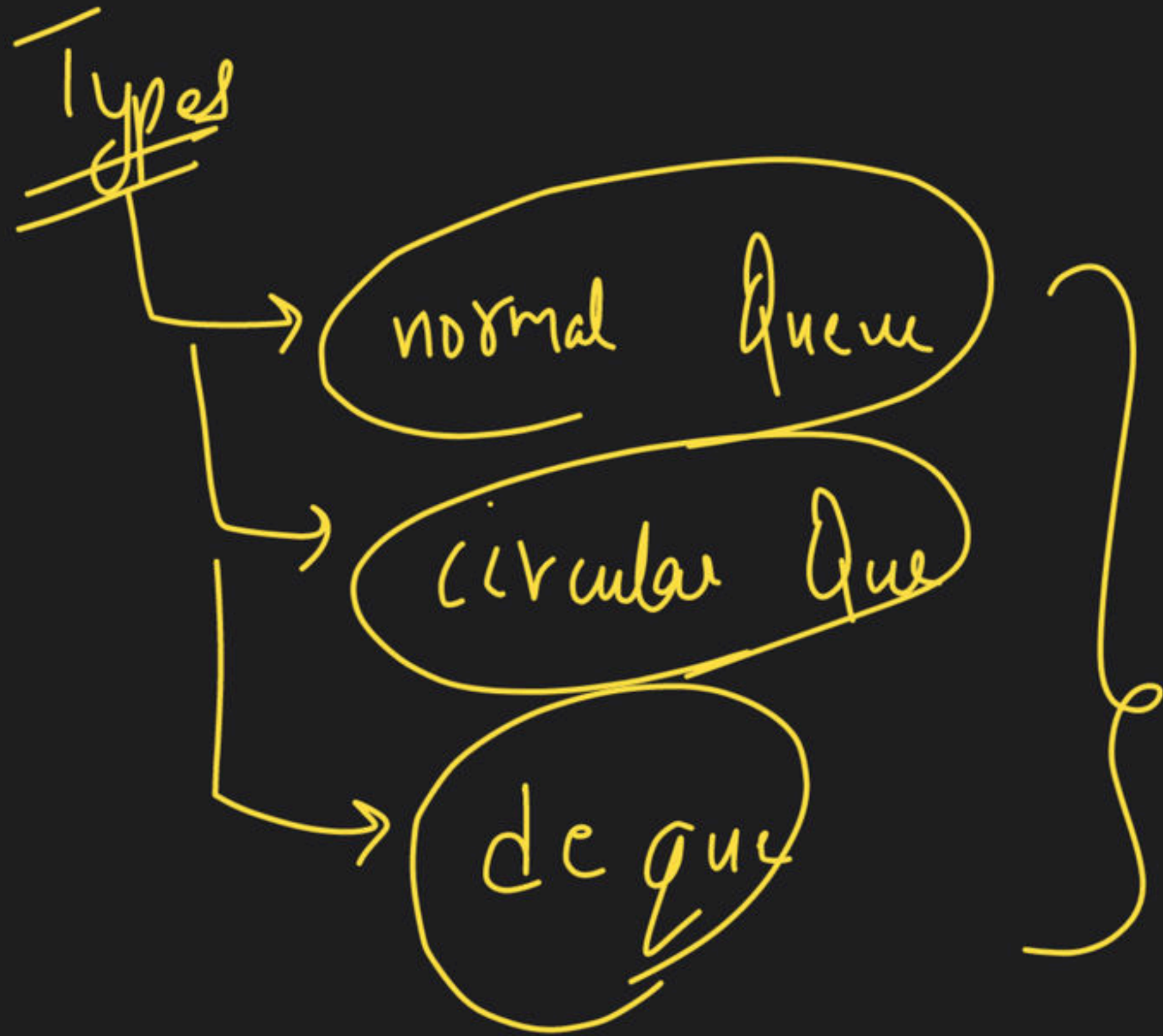


Queue Class-1

Special class

→ Queue → DS → FIFO

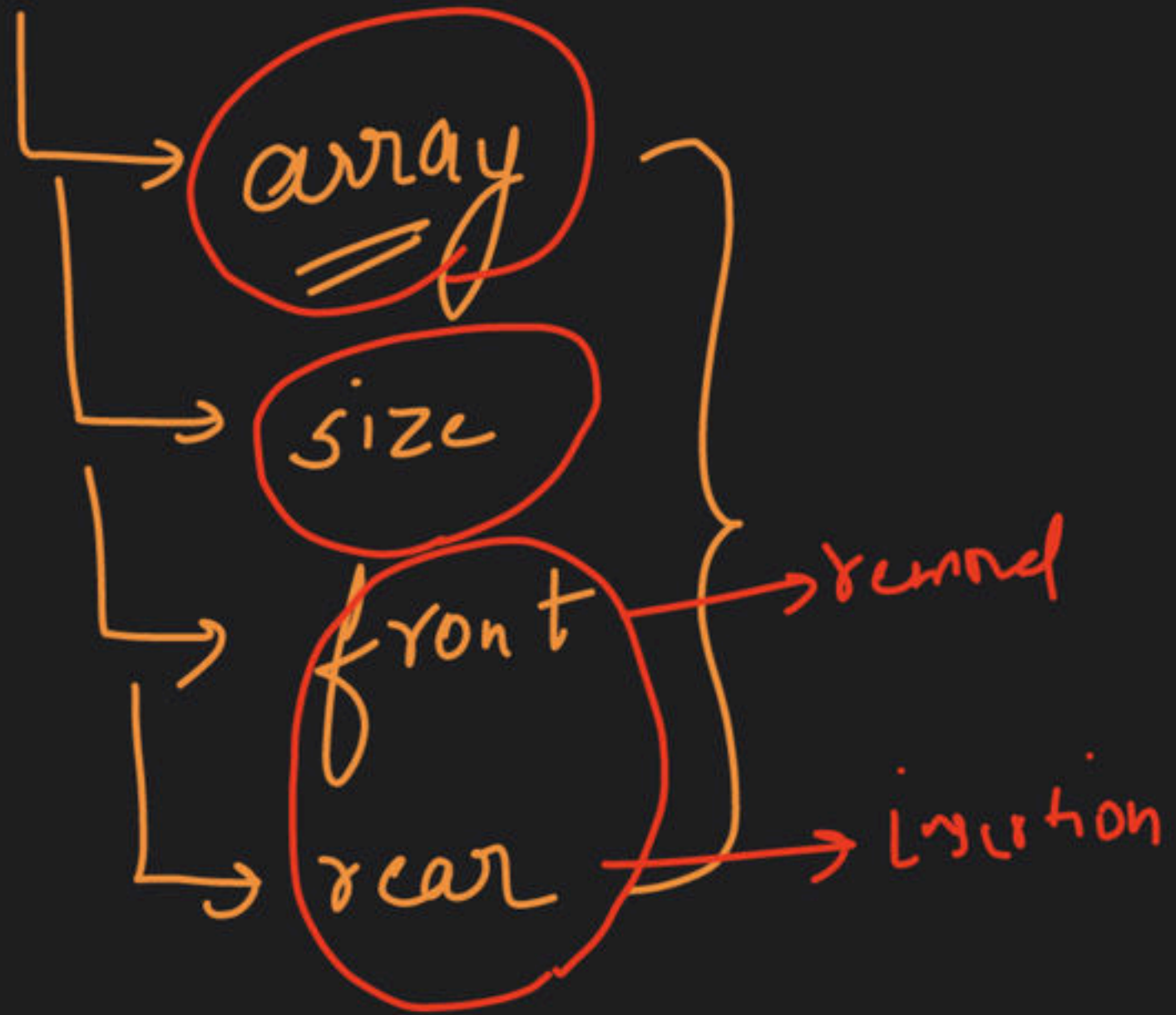


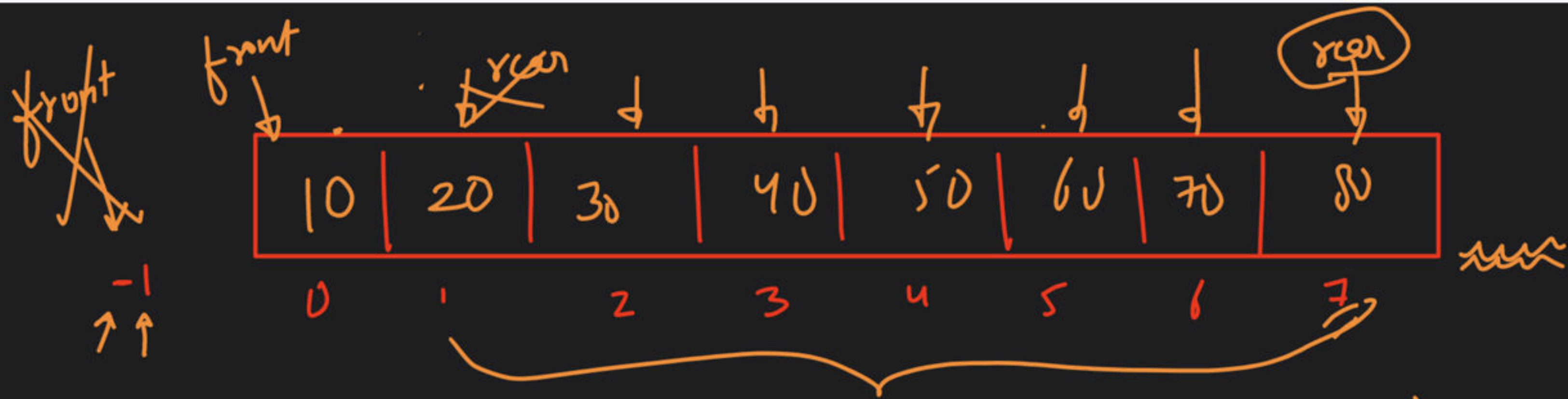


① stl
↓

STL

→
Scratch



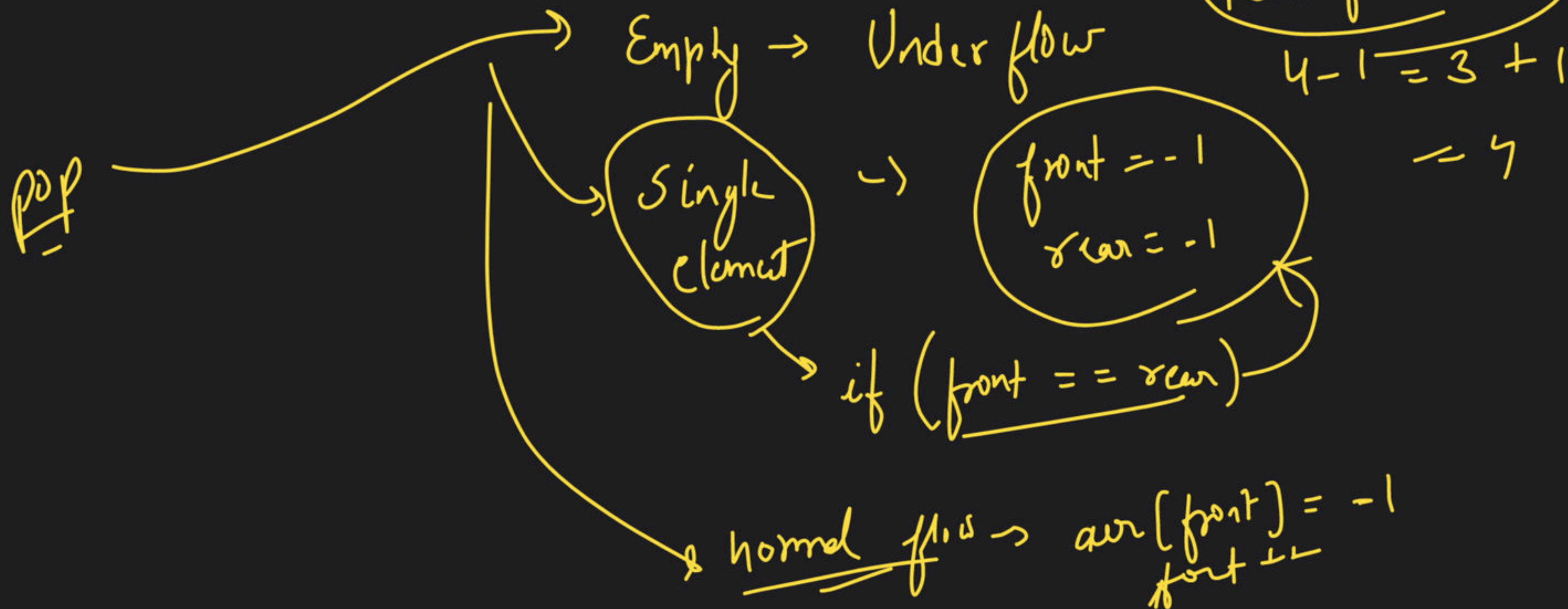
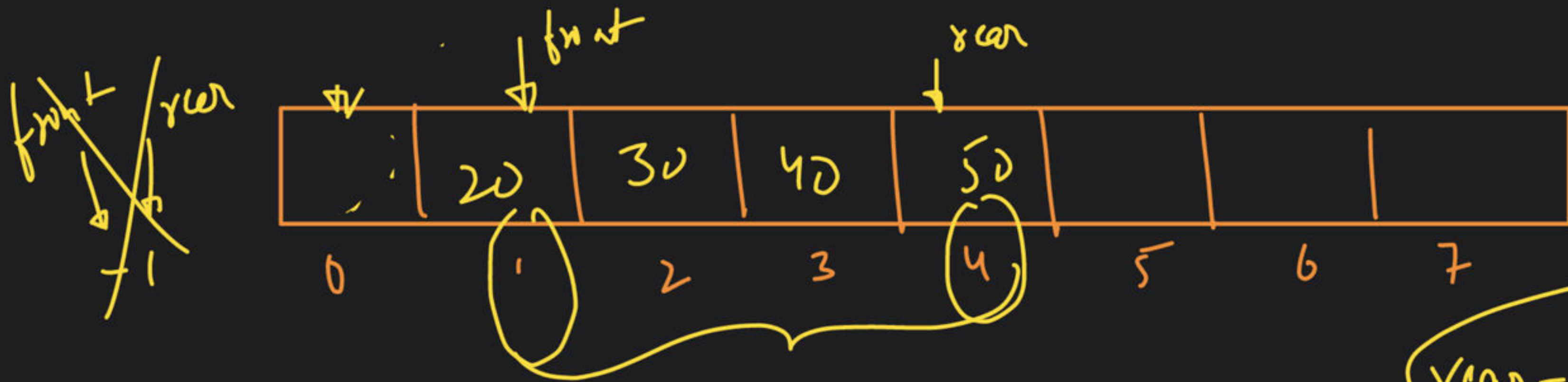


- insertion → rear →
- ① Overflow → If $(\text{rear} = \text{size} - 1) \text{ and } \text{count} < \text{size}$ Overflow
 - ② First element → $\text{rear}++$, $\text{arr}[\text{rear}] = 10$, $\text{front}++$
 - ③ normal insertion

q.push(10)
↑
q.push(20)

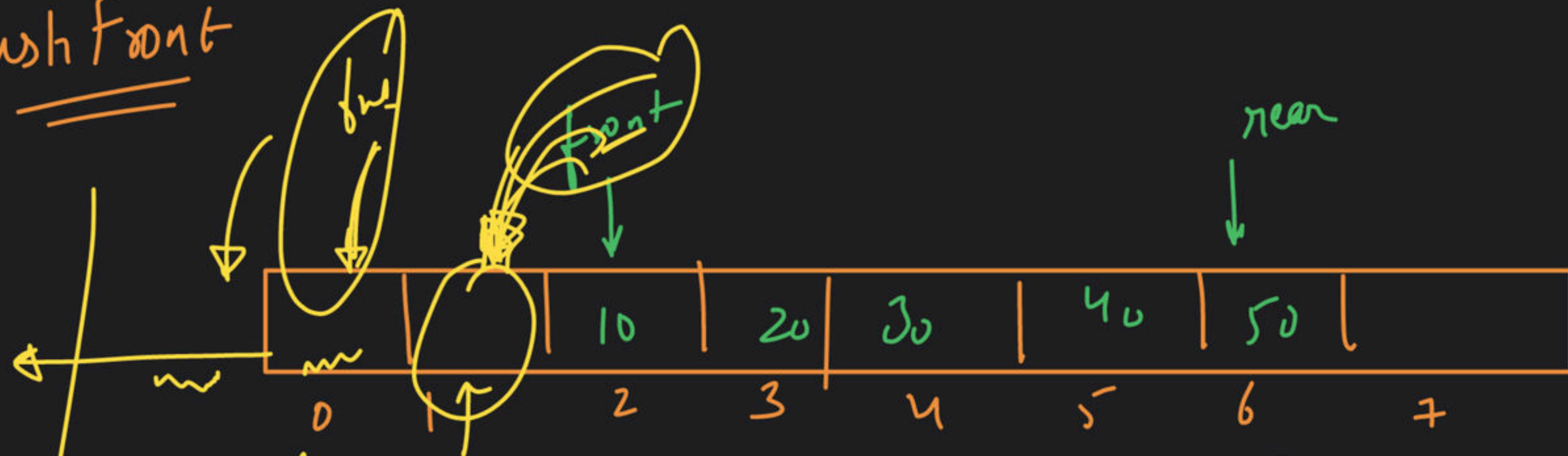
q.push(100)

→ rear++
→ arr[rear] = val



2 min
+ 3 call

→ push Front



Overflow →

if (front == 0)

↳ Overflow

front
clear

→ if (front == -1 & rear == -1)

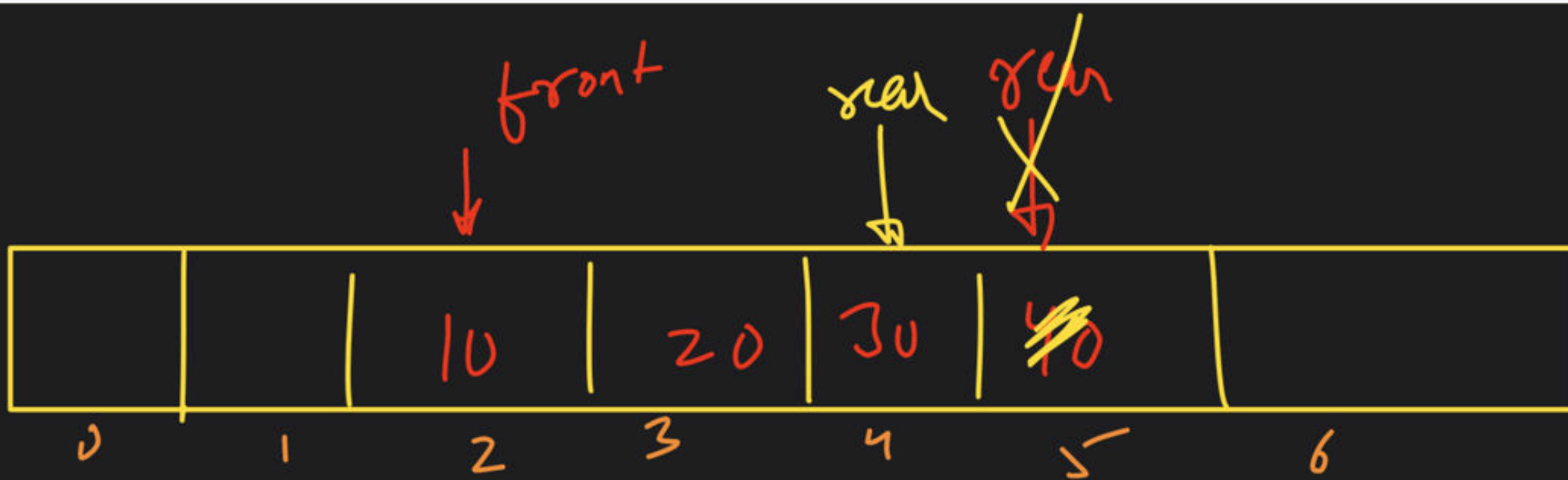
↳ $f \pm 1, r \pm 1, arr[f] = val$

normal
flow

f--

$arr[f] = val$

→ Popback

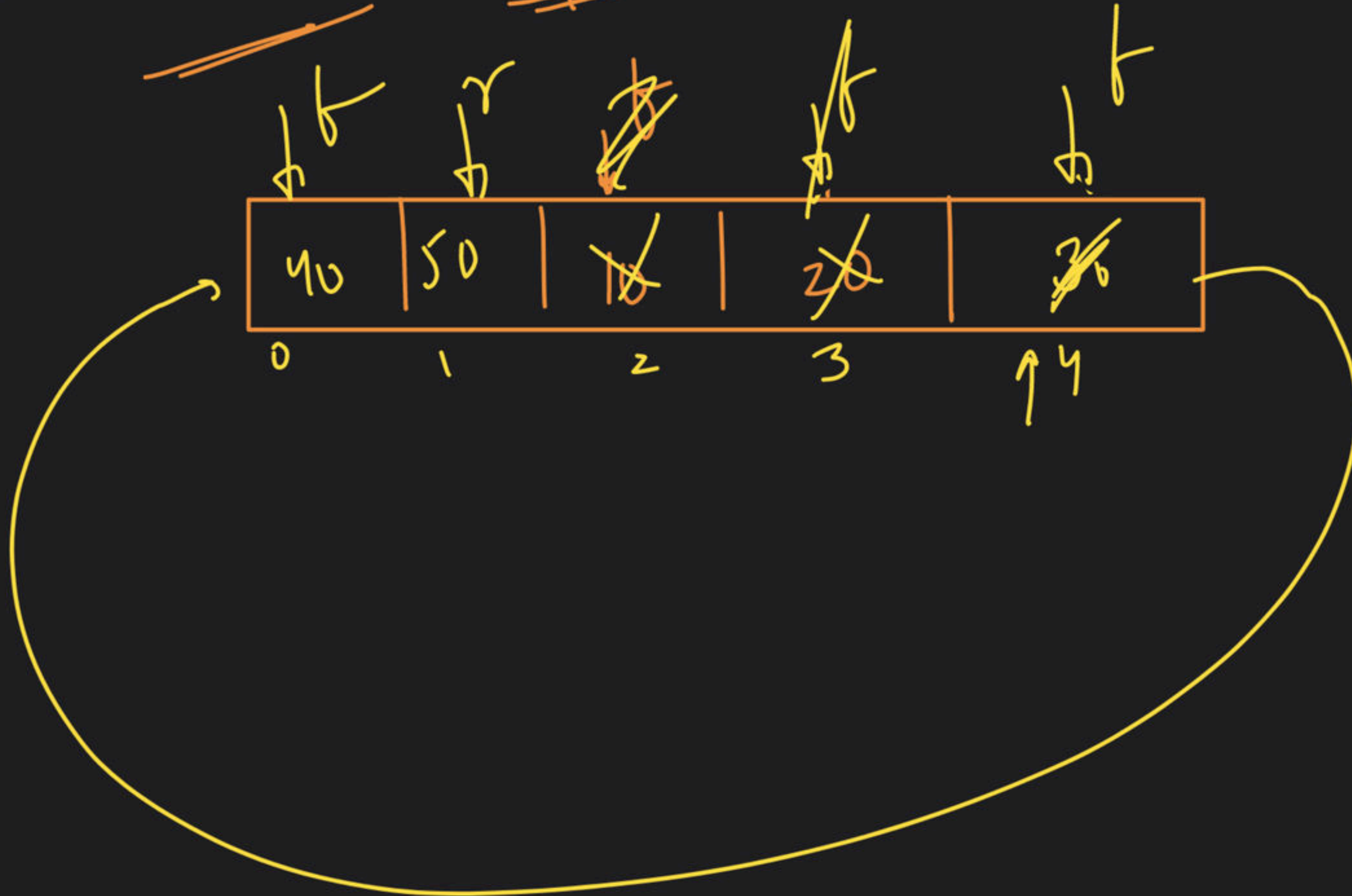


→ Underflow → $f = -1 \wedge r = -1$ → Underflow

→ $\text{is_empty} \rightarrow \text{if } (f == r) \rightarrow f = -1, r = -1$

↳ now flow → $\text{rear}--$

→ Circular Queue



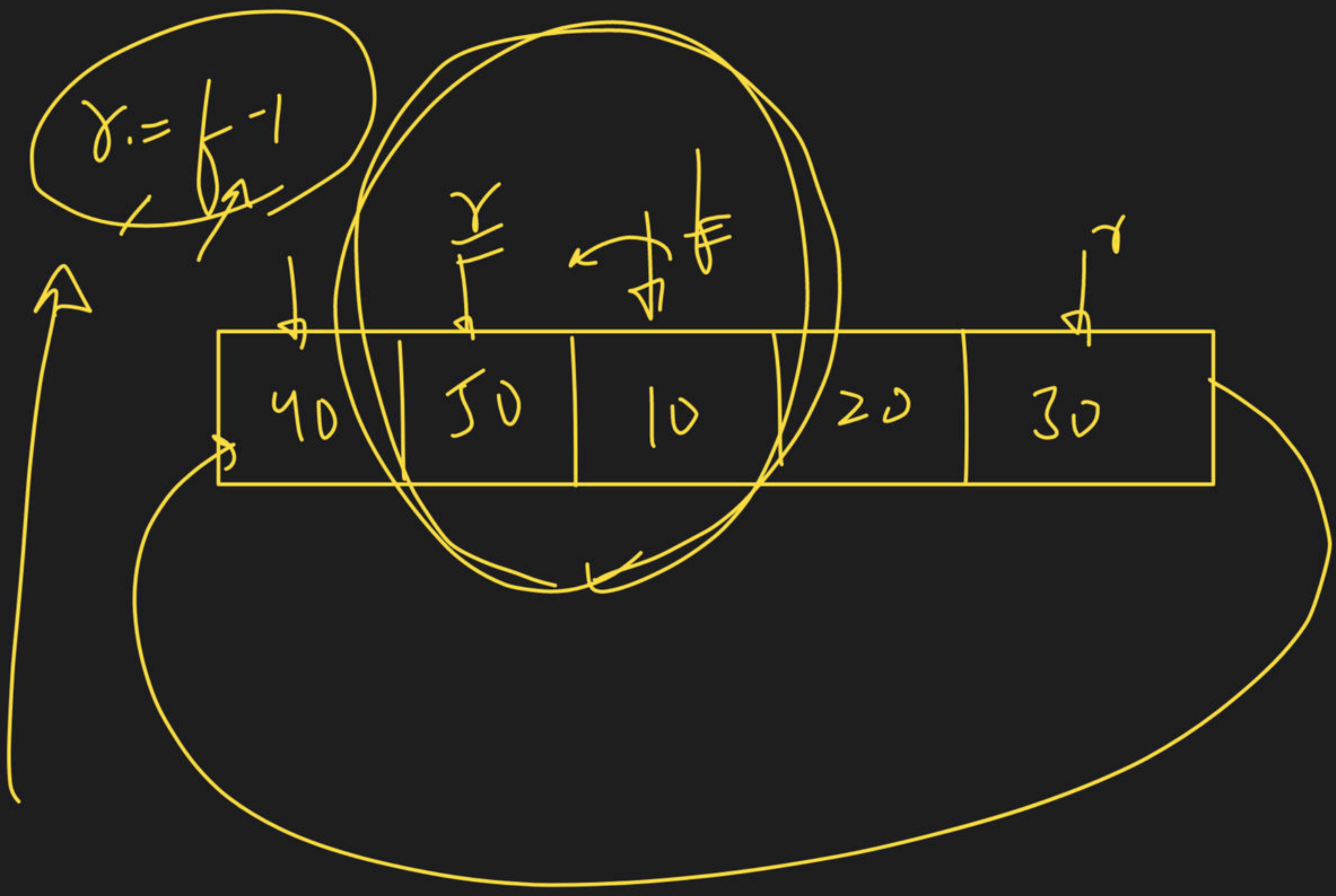


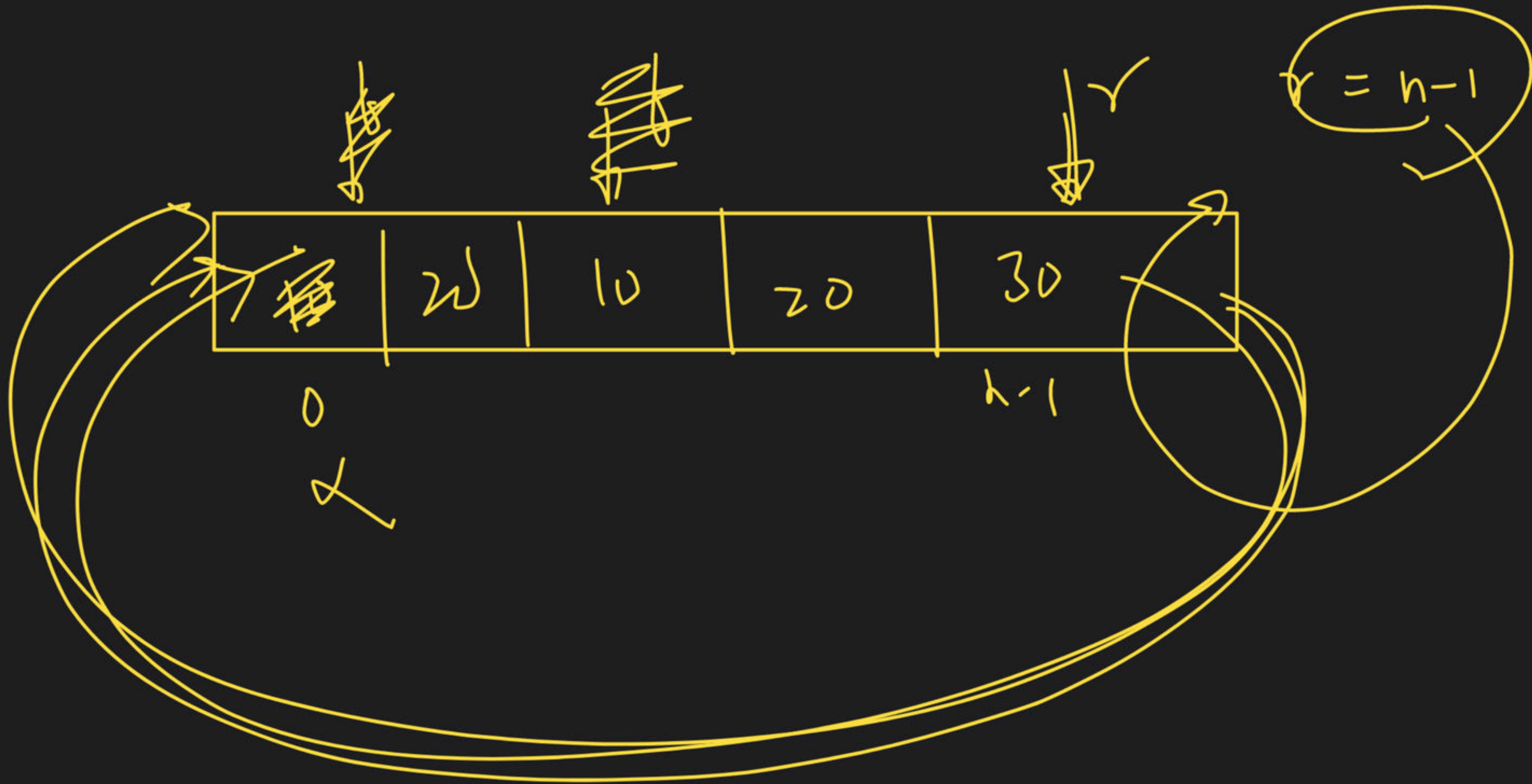
$l = 0$ & $r = n - 1$

10	20	30	40	50
----	----	----	----	----

0

$n - 1$





Pop

Underflow

$$f = -1 \ \& \ r = -1$$

Single Elem

$$f = r$$

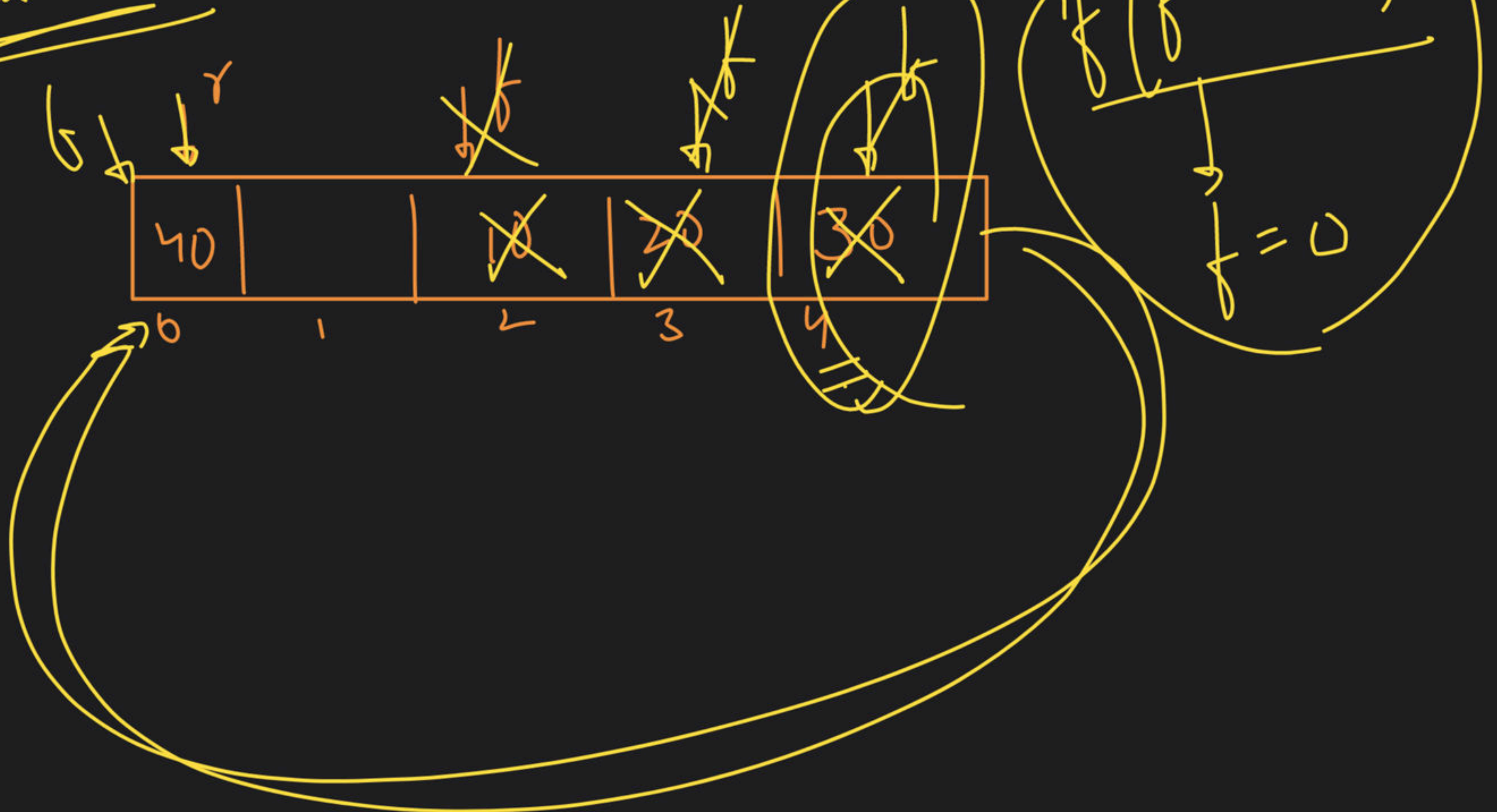
$$f = -1 \ \& \ r = -1$$

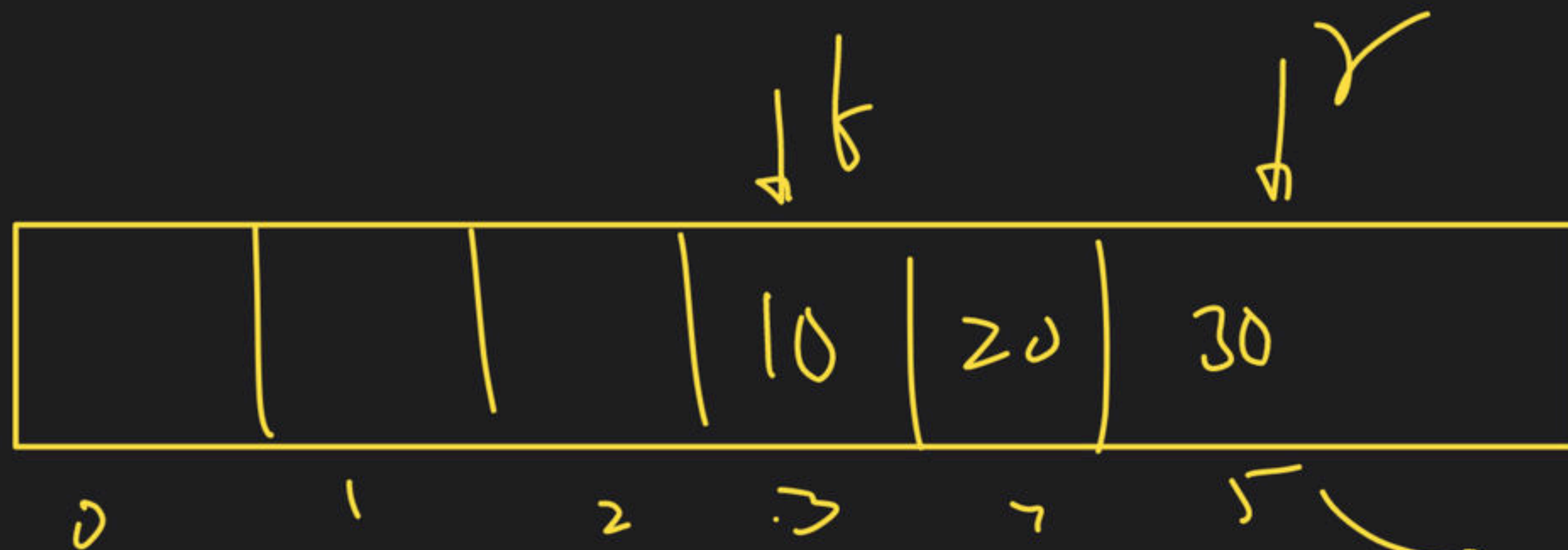
CiV

nl. F

! front++

circular nature





$$r - f + 1$$

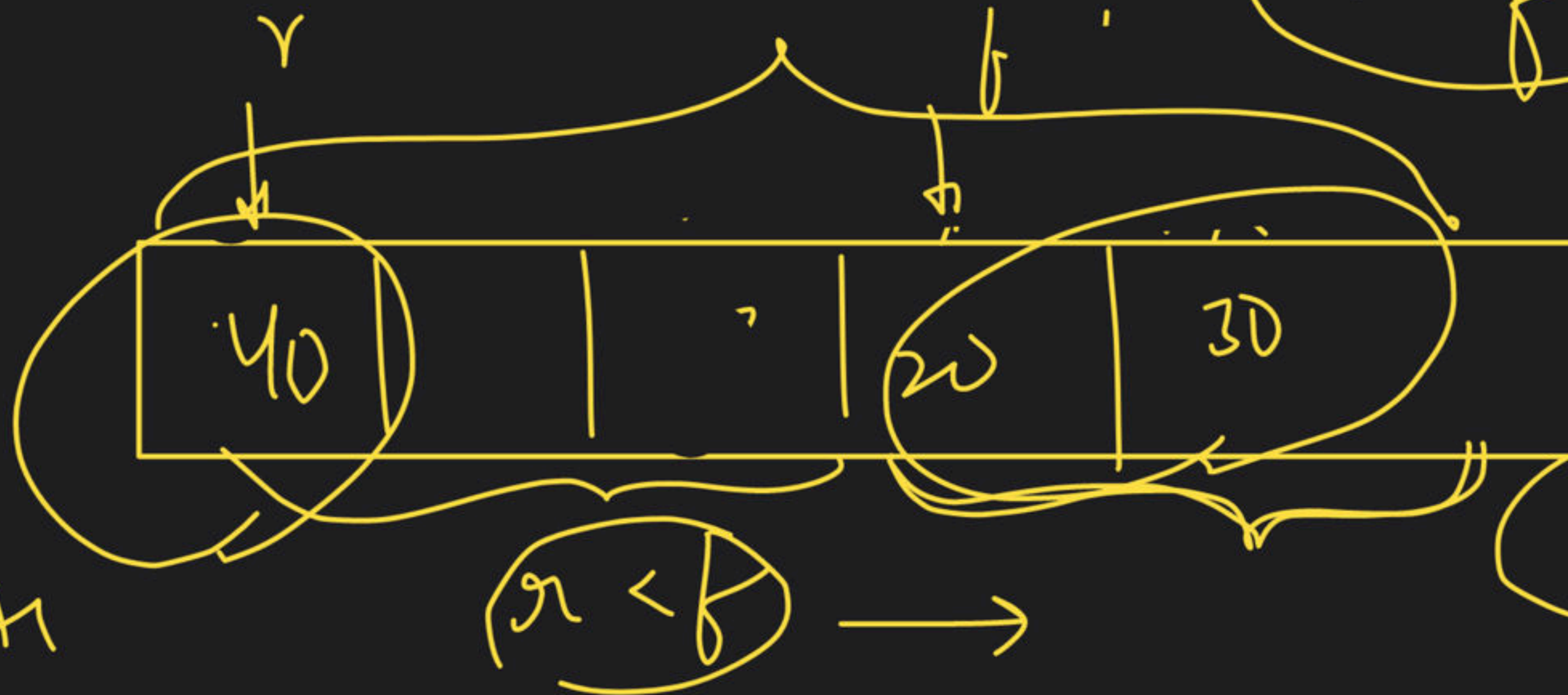
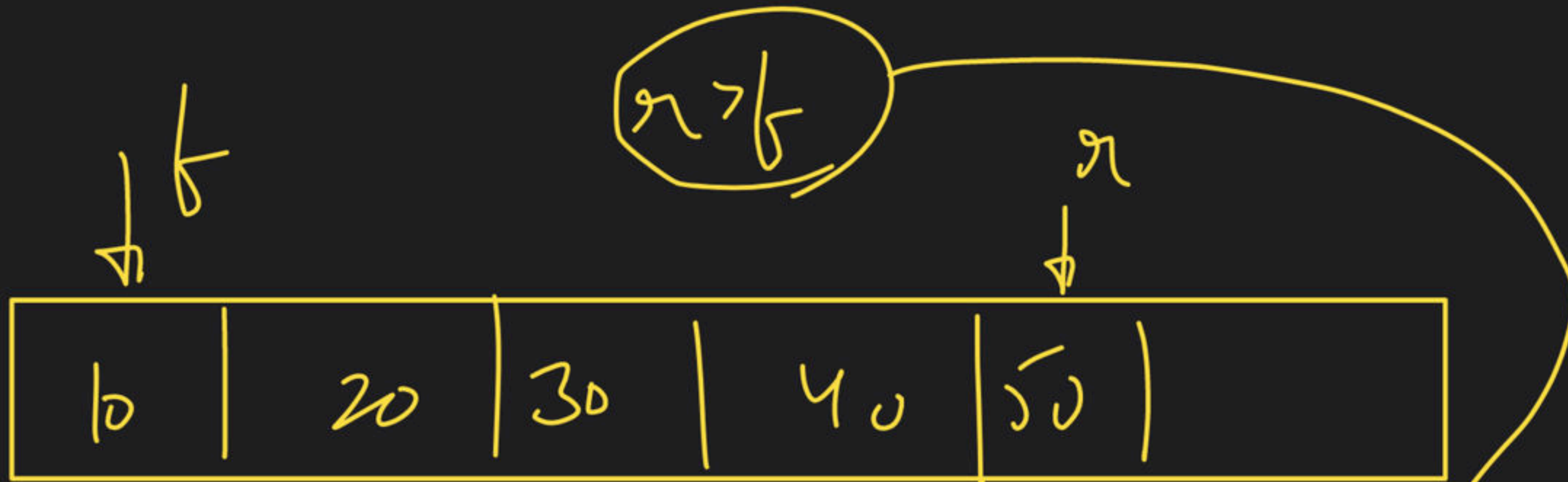
$$5 - 3 + 1 = 2 + 1 = 3$$

$$\text{abs}(r - f) + 1$$



$$f - r + 1$$

size



$$\begin{aligned} \text{size} - f &= 2 \\ 5 - 3 &= 2 \end{aligned}$$

$$r - f + r + 1$$

		r		b						
10		20		30		40		50		6
0		1		2		3		4		5

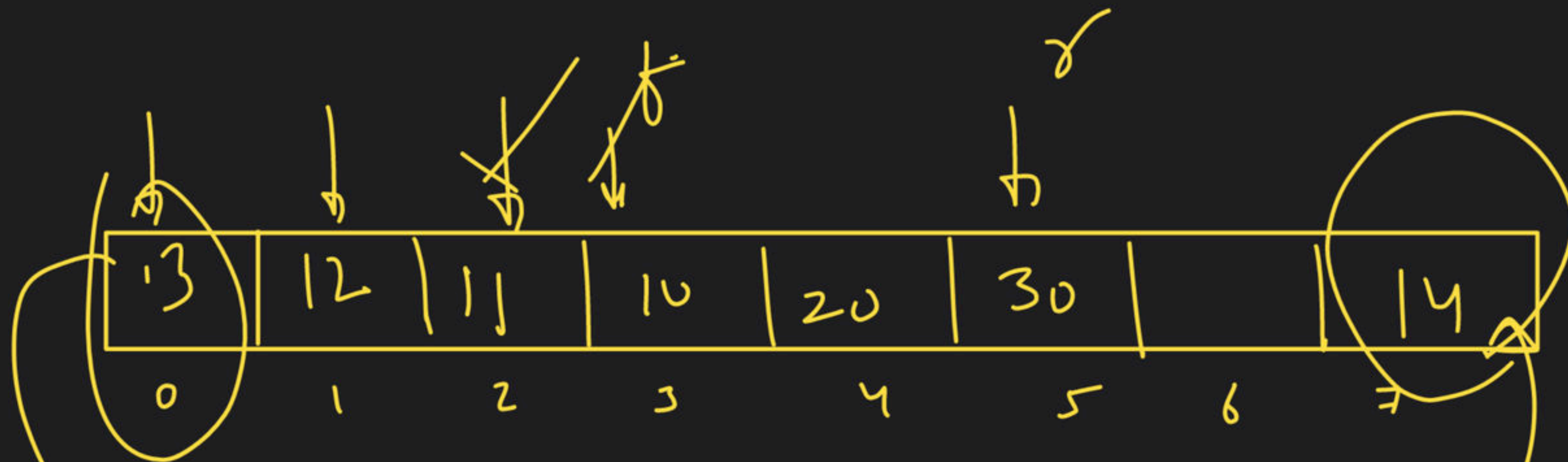
$$s = b + r + 1$$

~~$$6 = 3 + 2 + 1$$~~

$$= 6$$

degree + circular Nature

9 min
Break

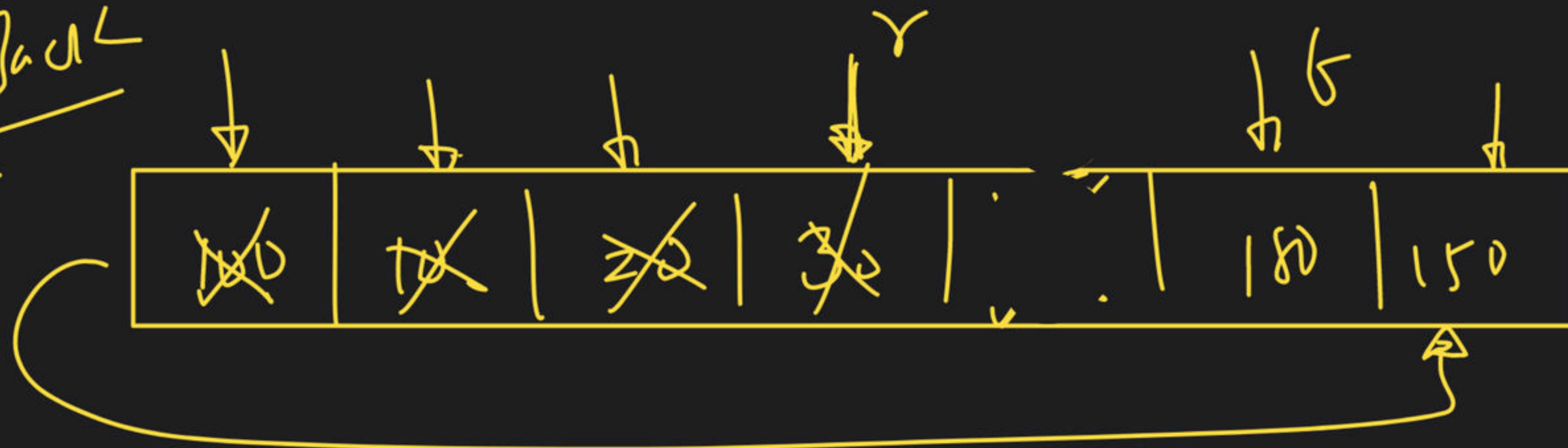


push front

normal $\rightarrow f \dots arr[f] = val$

\rightarrow Circular $\rightarrow f == 0 \text{ \& \& } x == n-1$
 $\hookrightarrow f = n-1$
 $arr[f] = val$

popBack



normal \rightarrow

$arr[r] = -1$, $r--$

Circular case \rightarrow

if ($rear == 0$)

$arr[r] = -1$
 $r \rightarrow n-1$















