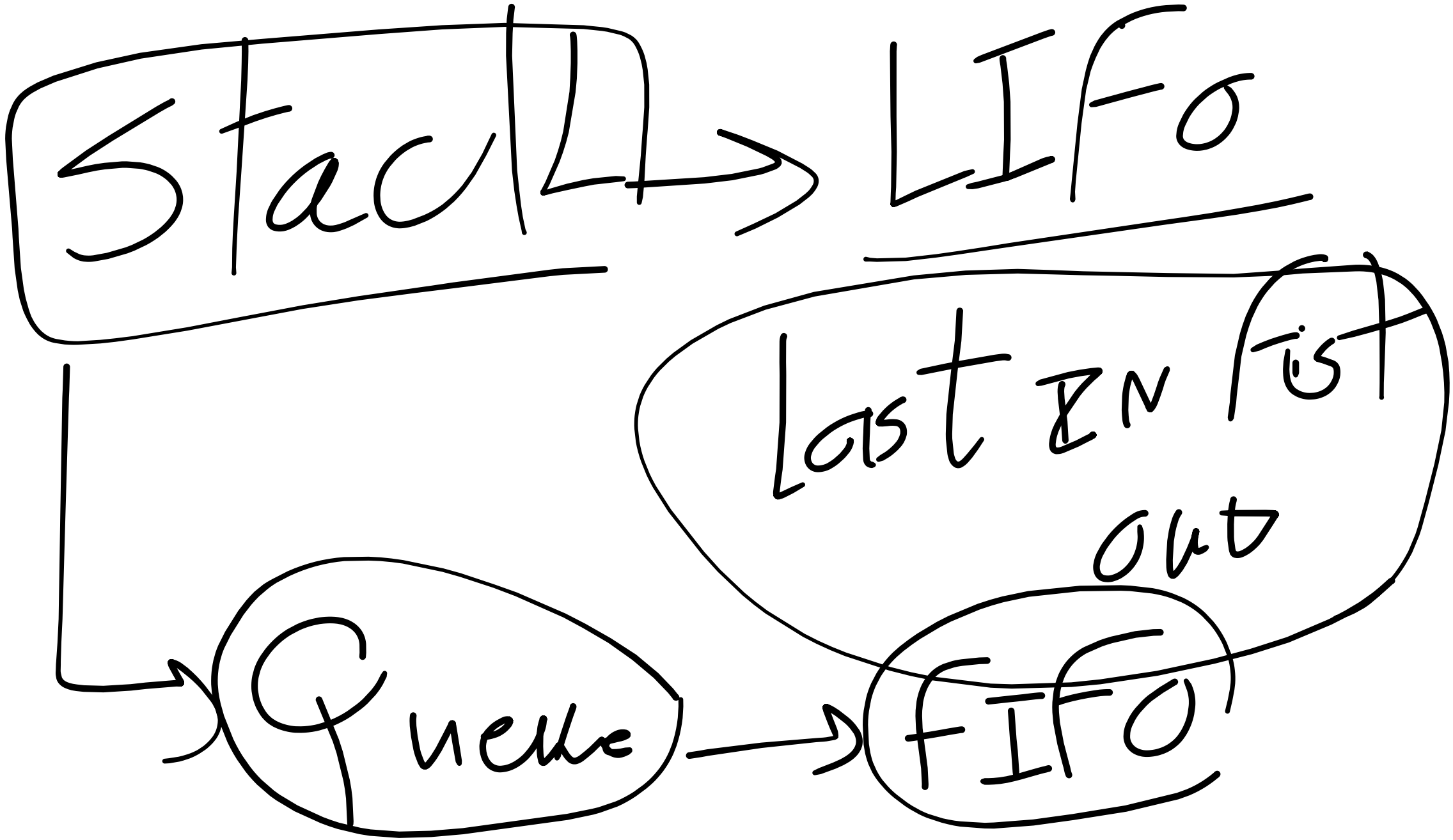
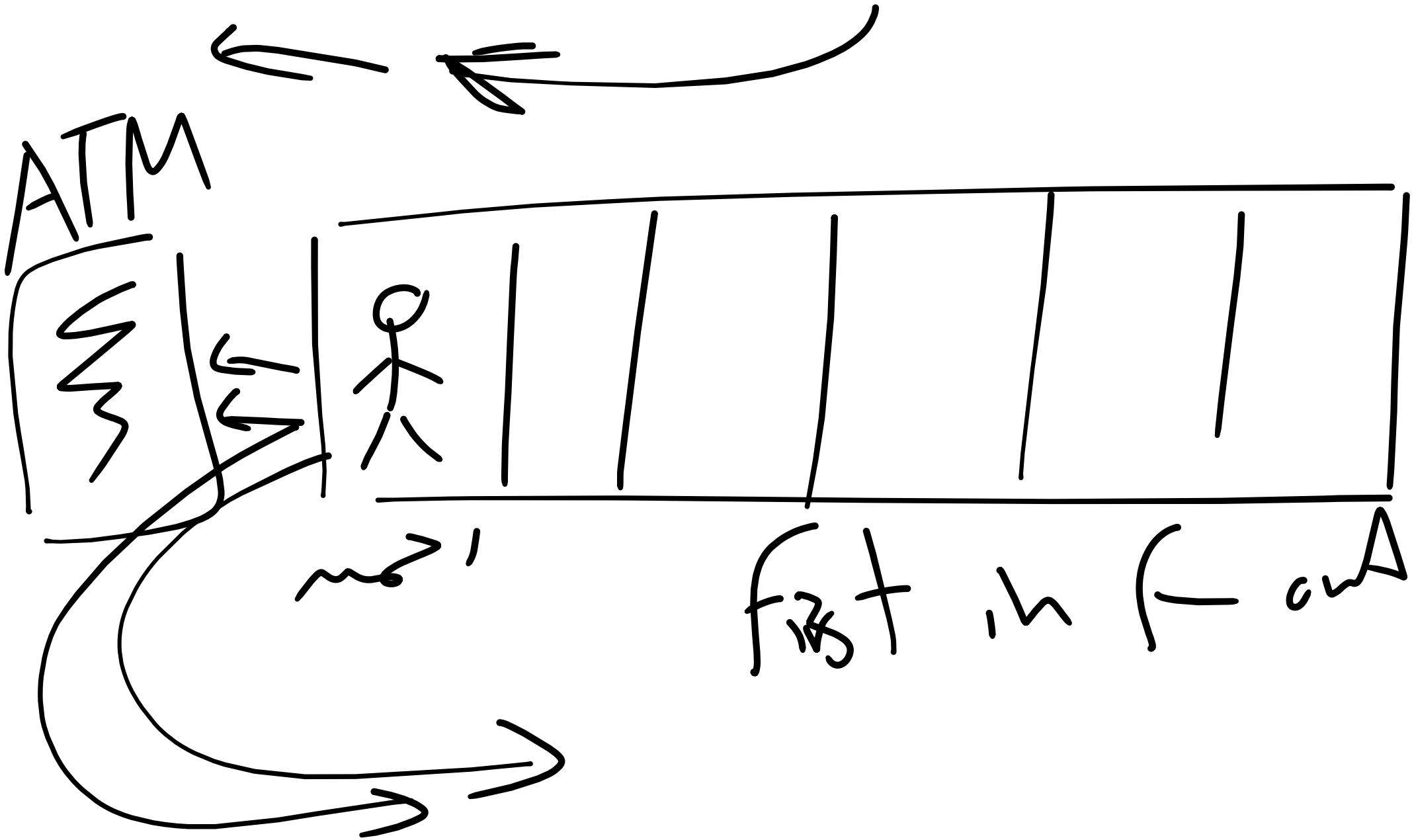
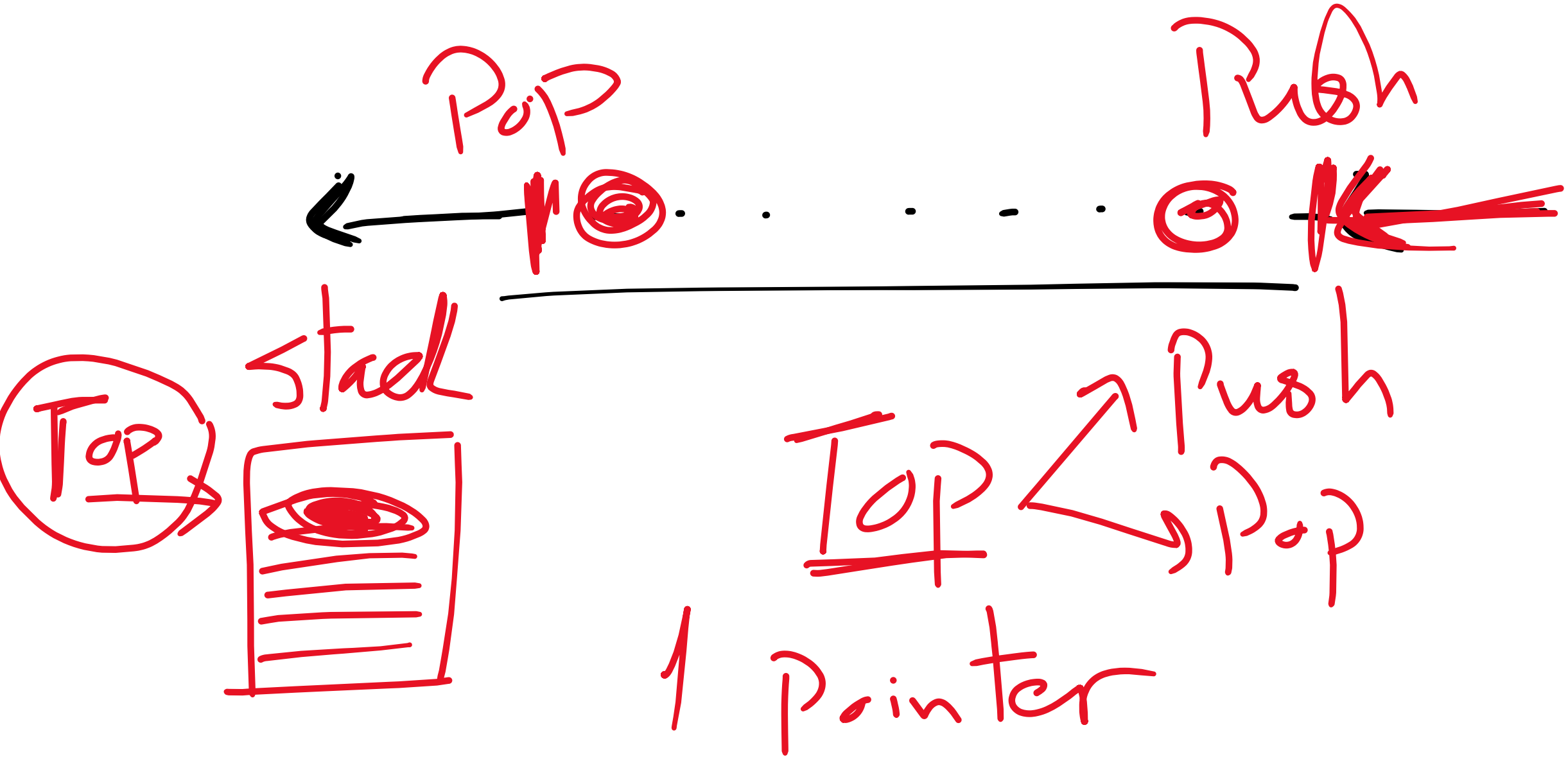
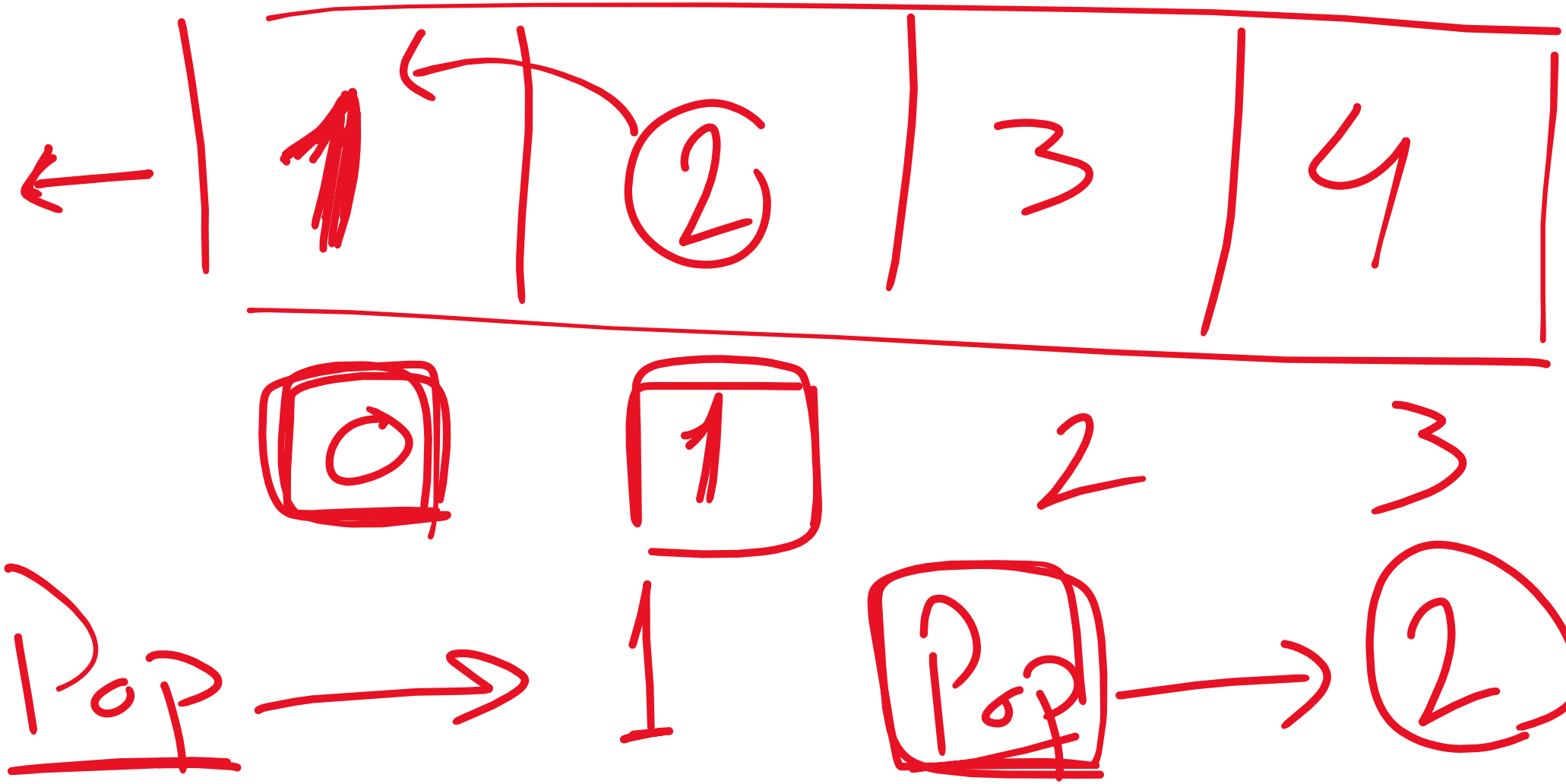
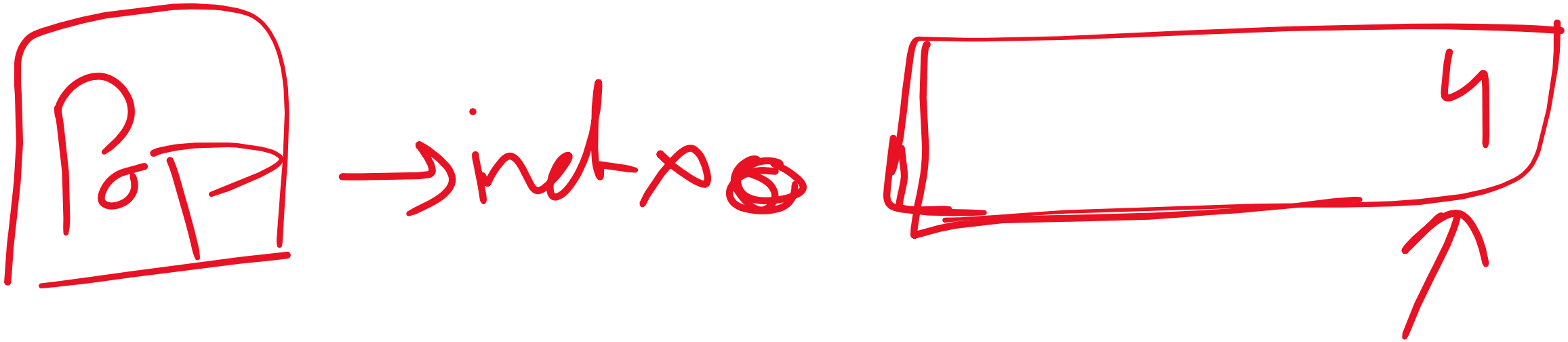

Stack → LIFO
Last IN First out
Queue
FIFO


ATM
first in first out


Pop
Push
stack
Top
Top
Push
Pop
1 Pointer

Push 1 Push 2 ... 3 ... 4

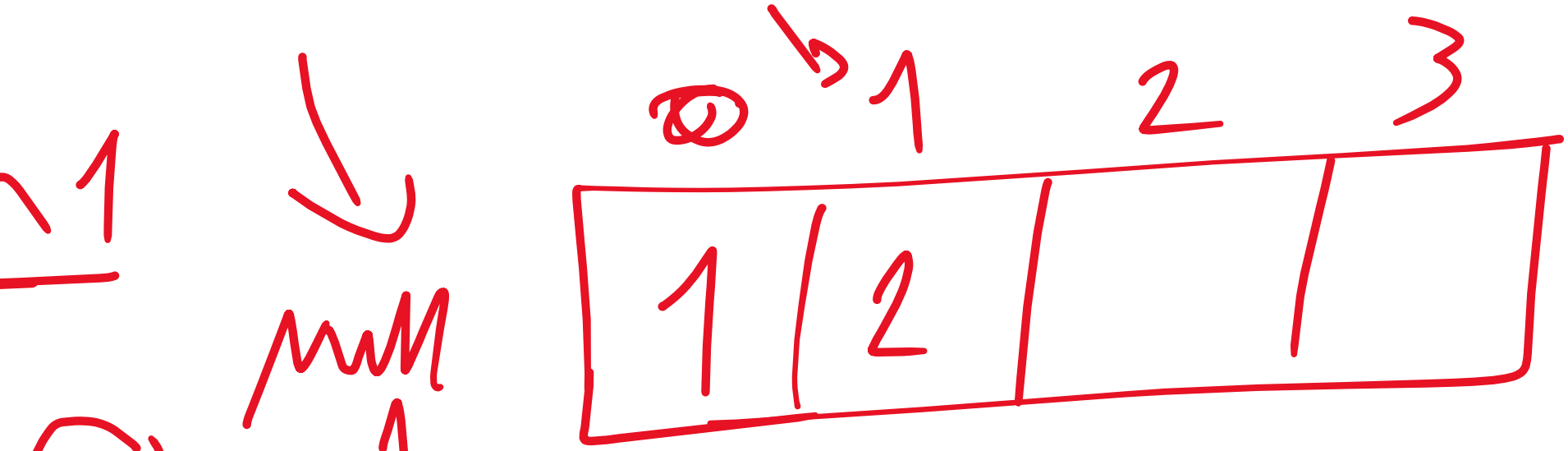




Pop → index 1

Pointer for Popping

Push 1

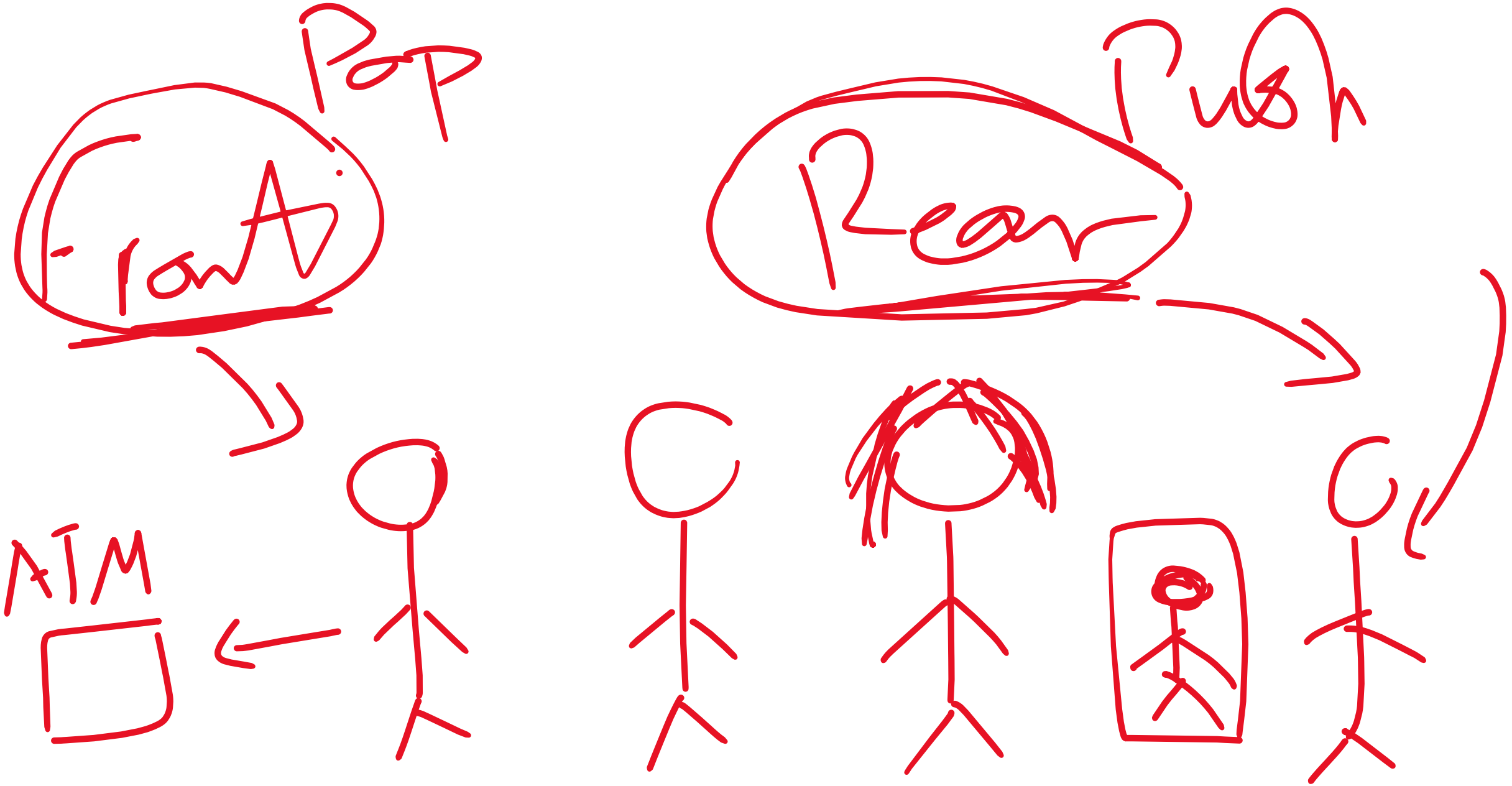


index ⓪

null
-1

Push 2 → index ①

Pushing
Pointer


Pop
Front
Push
Rear
ATM

Front

Rear

→ Enqueue Push

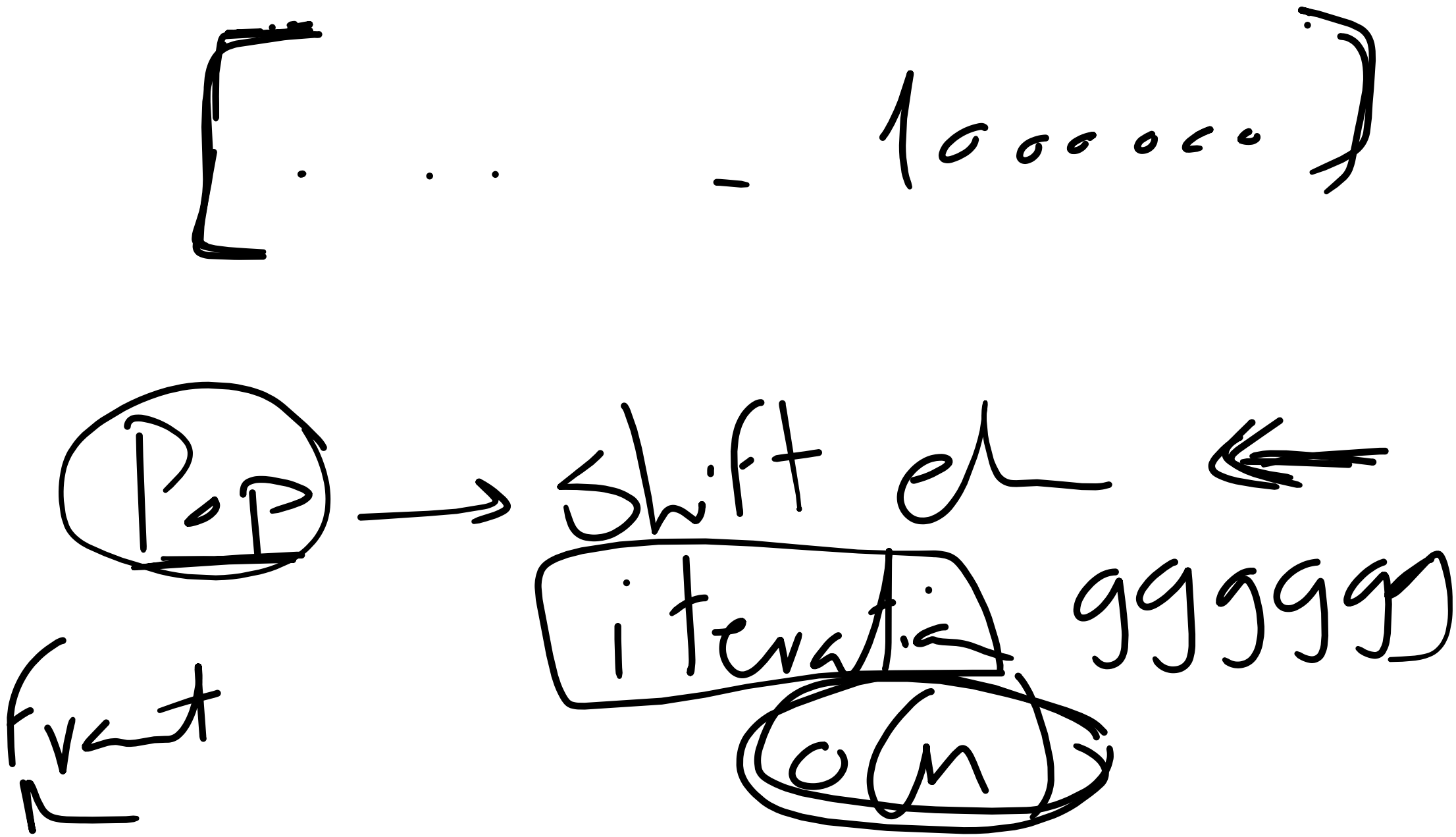
→ Dequeue Pop

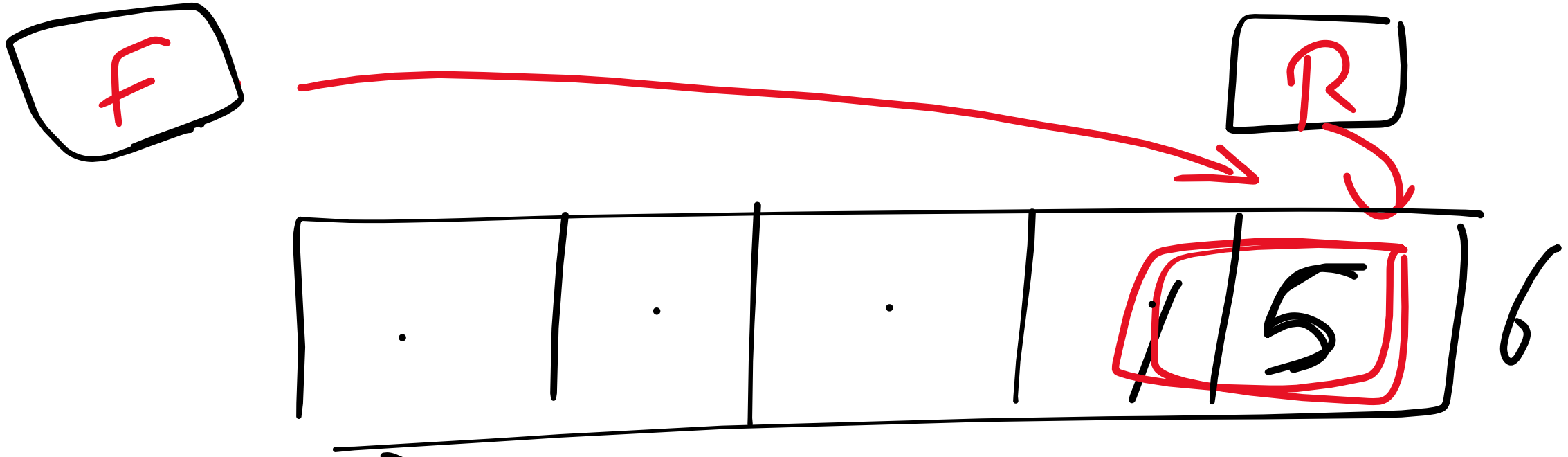
Pop → 1

Push 6

Push 5

2 3 4 5 x


Pop
shift el
iterati
com



Pop Pop

Pop → 1 $O(1)$

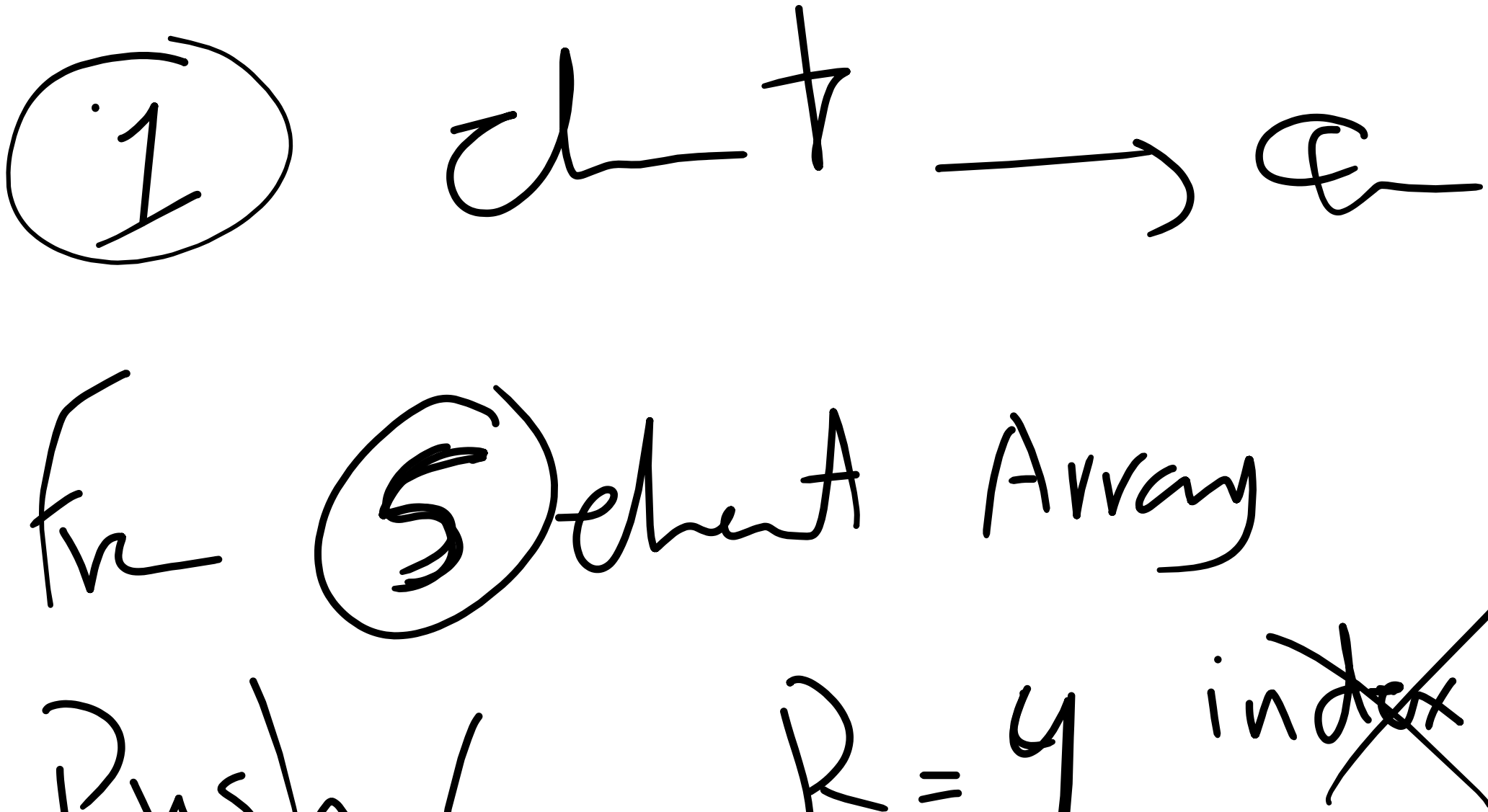
Push 5 → $O(1)$

Pop → 2 $O(1)$

F — R

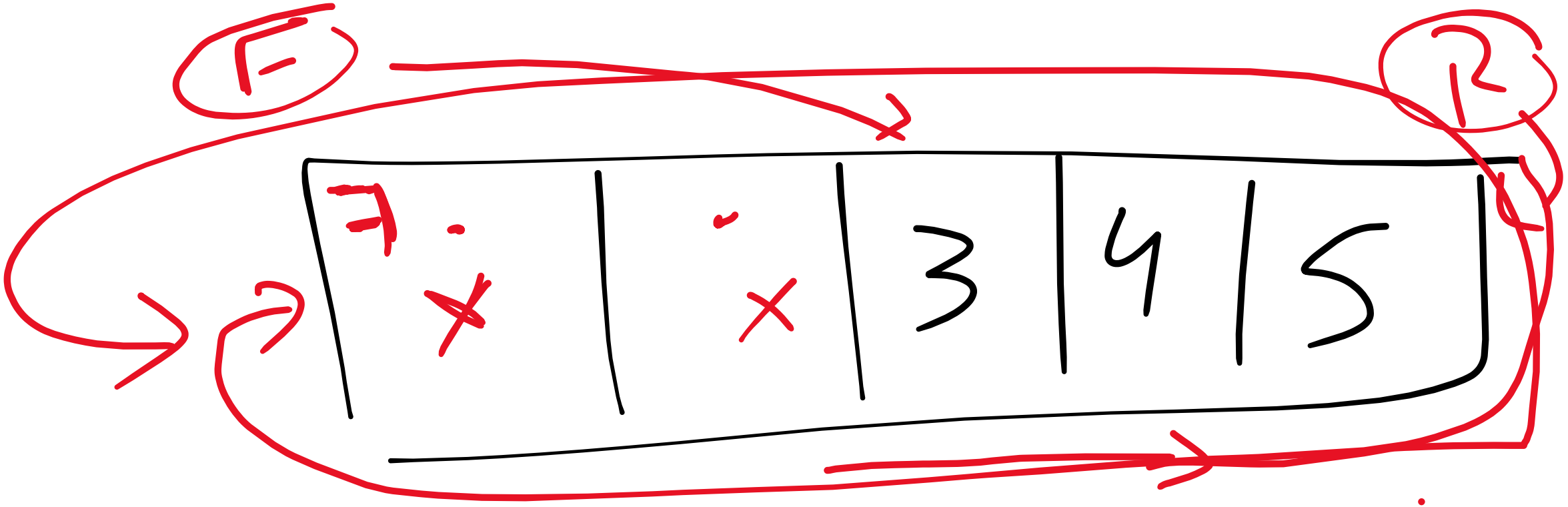
↓

معا


1
5
Push 6
R = 4
index 5

Linear Queue X

Circular Queue ✓

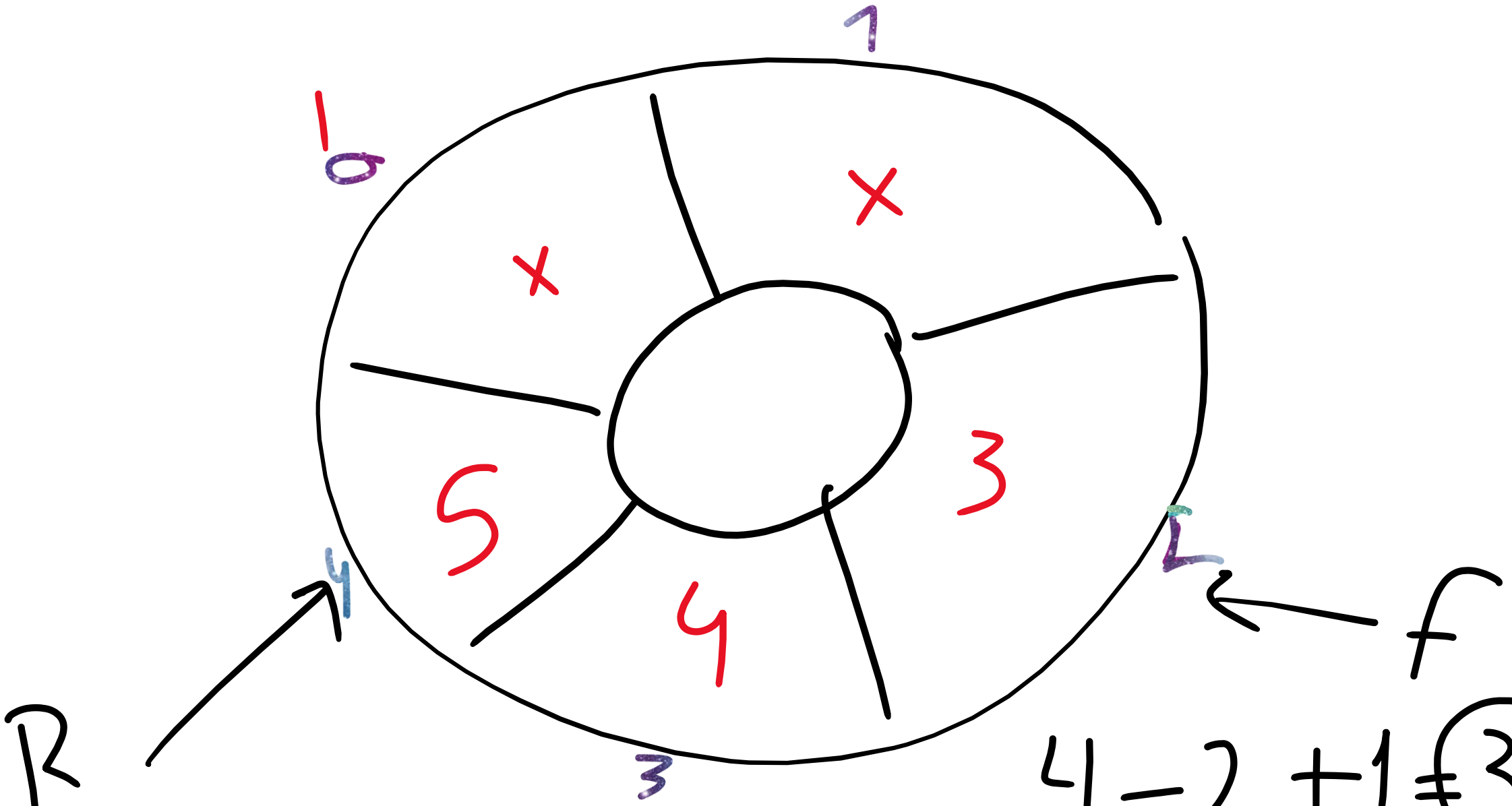


Push 7

F - R+1 < array size

1

5



$4 - 2 + 1 = 3$

R ⟶ 4

Push ⟶ 0

R=0

R+1%5

0+1%5=1

1+1%5=2

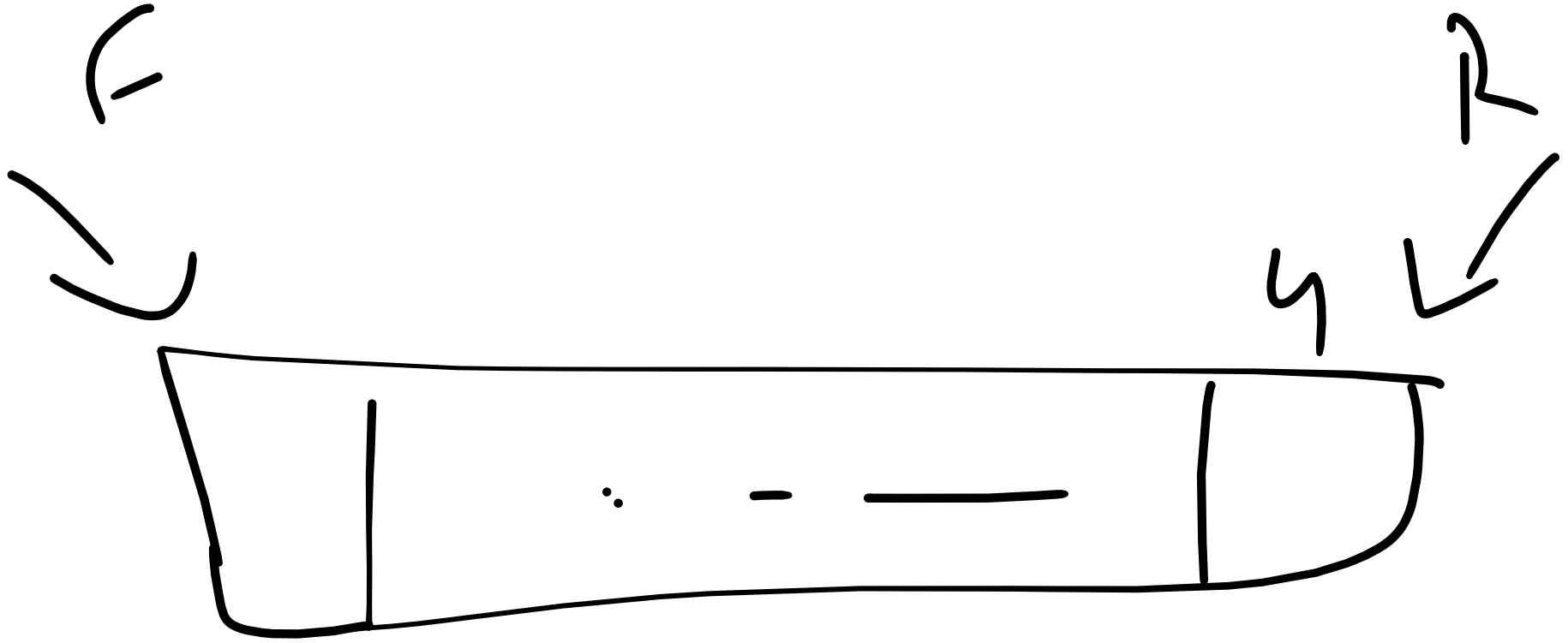
2+1%5=3

3+1%5=4

4+1%5=0

0%5

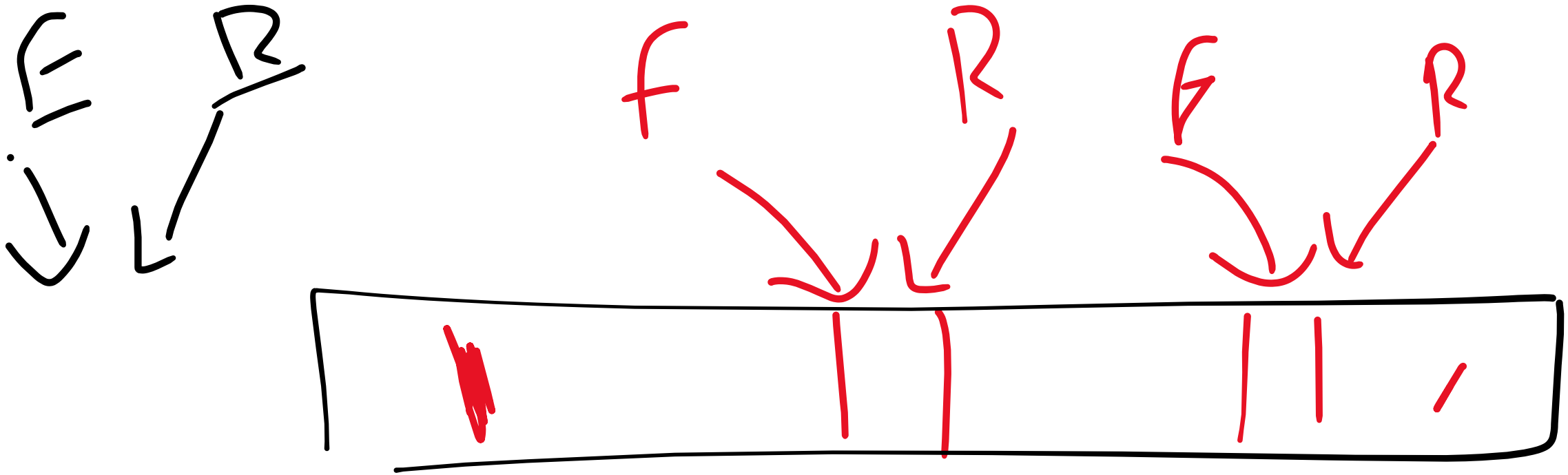
Array size



Push

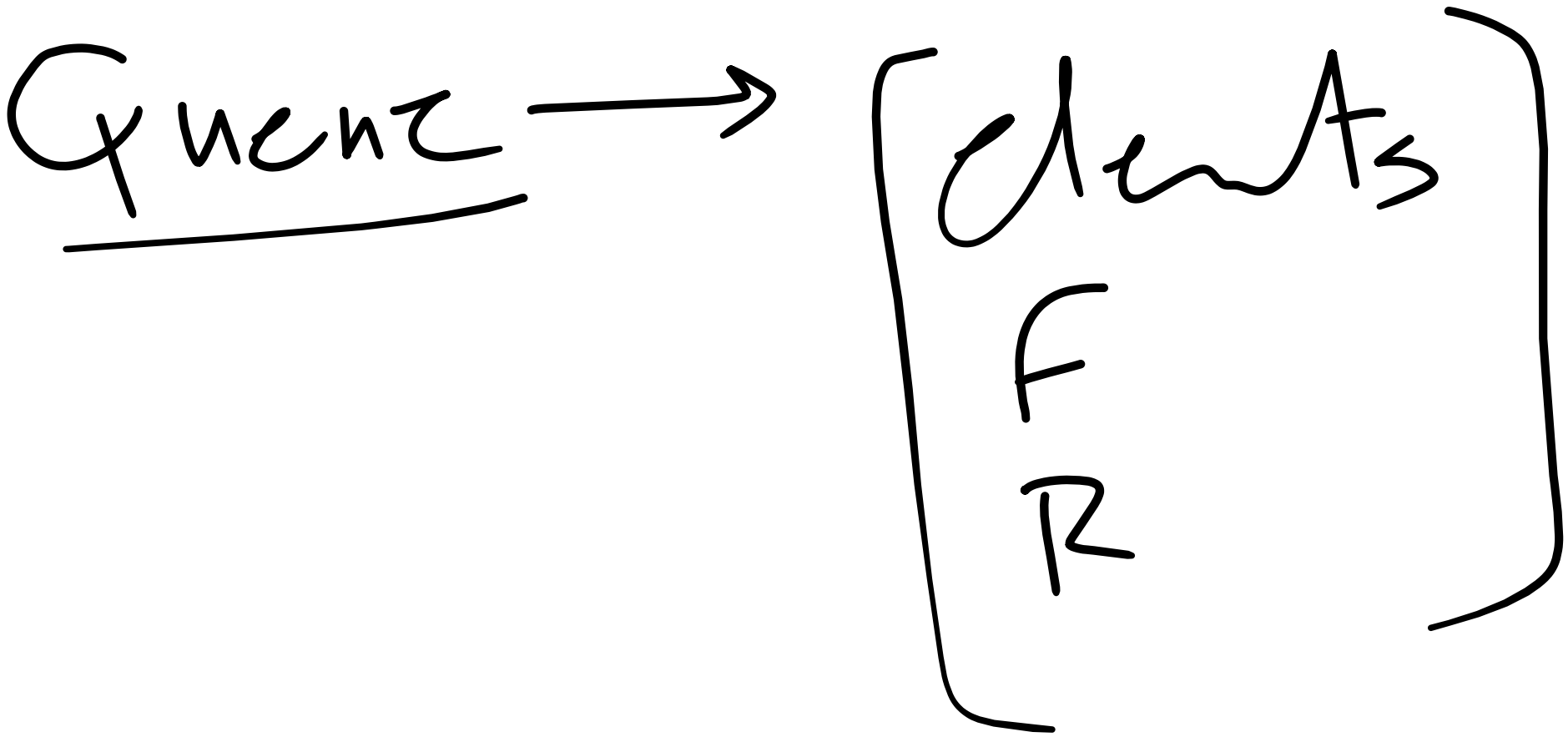
(R+1)%5 = 0

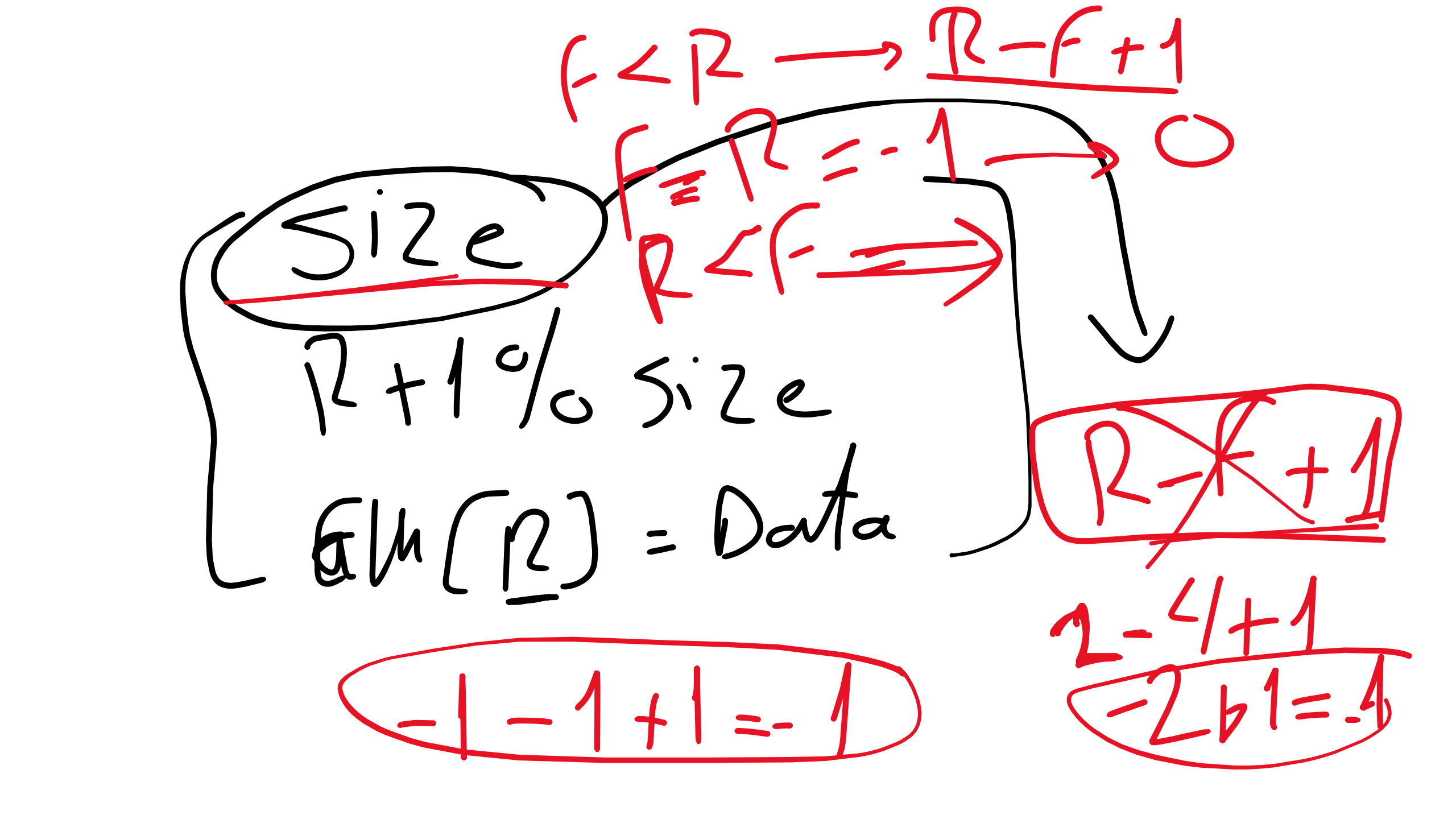
F = R ⟶ empty ⟶ (-1)



$R = f = -1 \longrightarrow$ empty

$R = f = i \longrightarrow$ there is only one element


Queue
elements
F
R



$f < R \longrightarrow R - f + 1$

$f = R = -1 \longrightarrow 0$

$R < f \Longrightarrow$

Size

$R + 1\%$ size

$GM[R] = \text{Data}$

$\boxed{R - \cancel{f} + 1}$

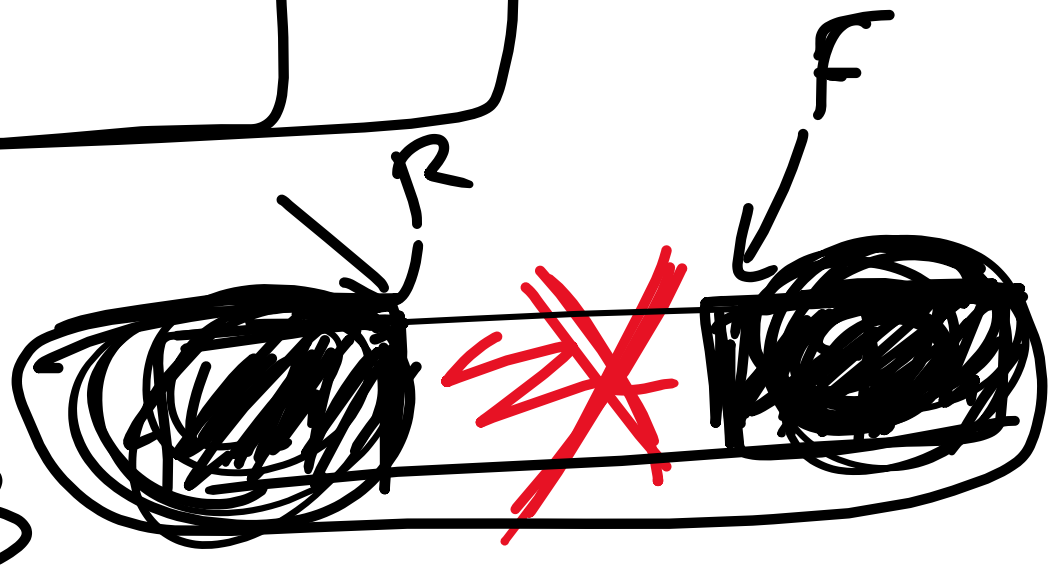
$2 - 4 + 1$

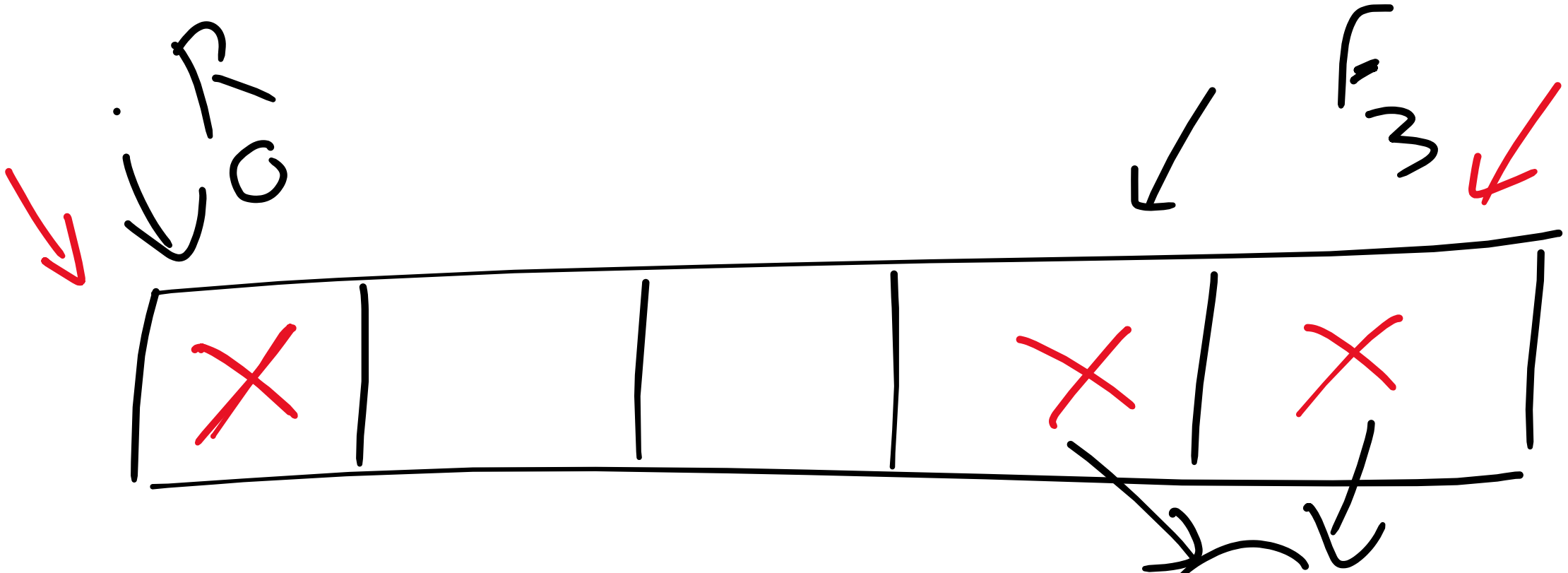
$-2 + 1 = -1$

$-1 - 1 + 1 = -1$

$$\left(\overset{5}{\text{Max}} - \overset{3}{F}\right) + \left(\overset{2}{R} + 1\right)$$

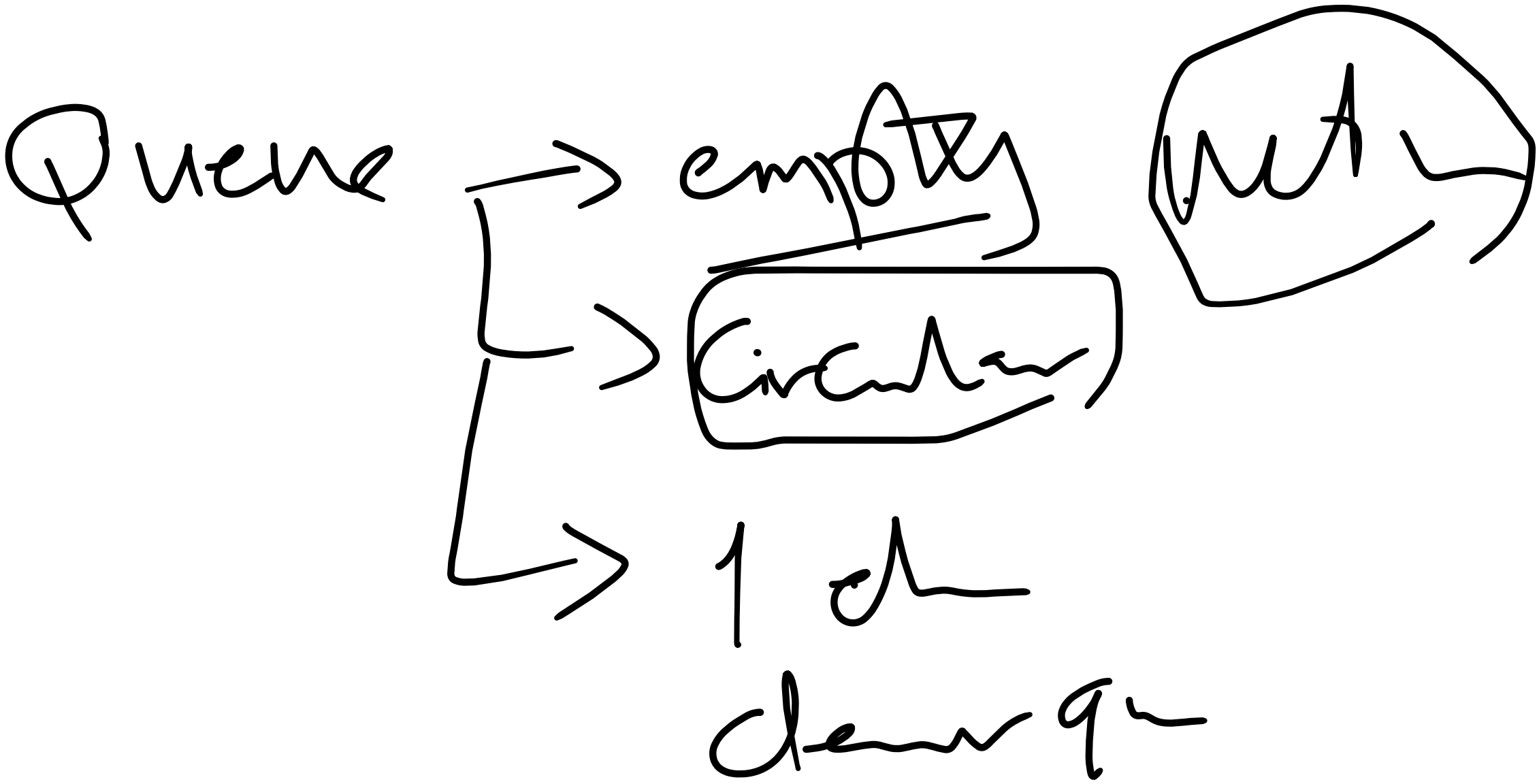
$$2 + 1 = 3$$





Max - F = 5 - 3 = 2

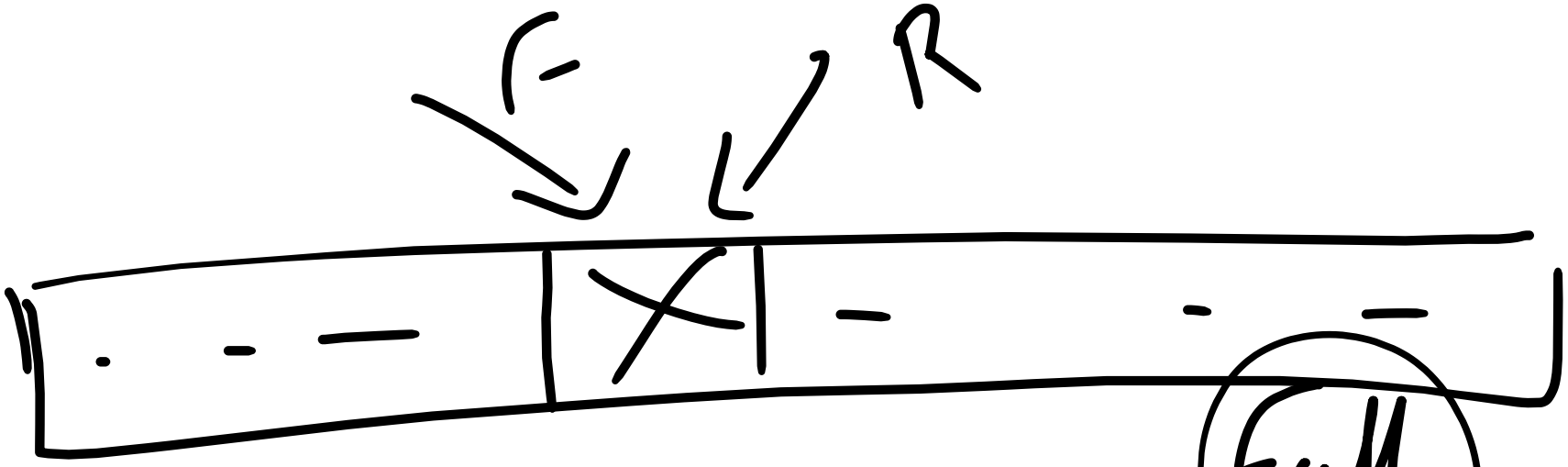
R + 1 = 0 + 1 = 1 → 3



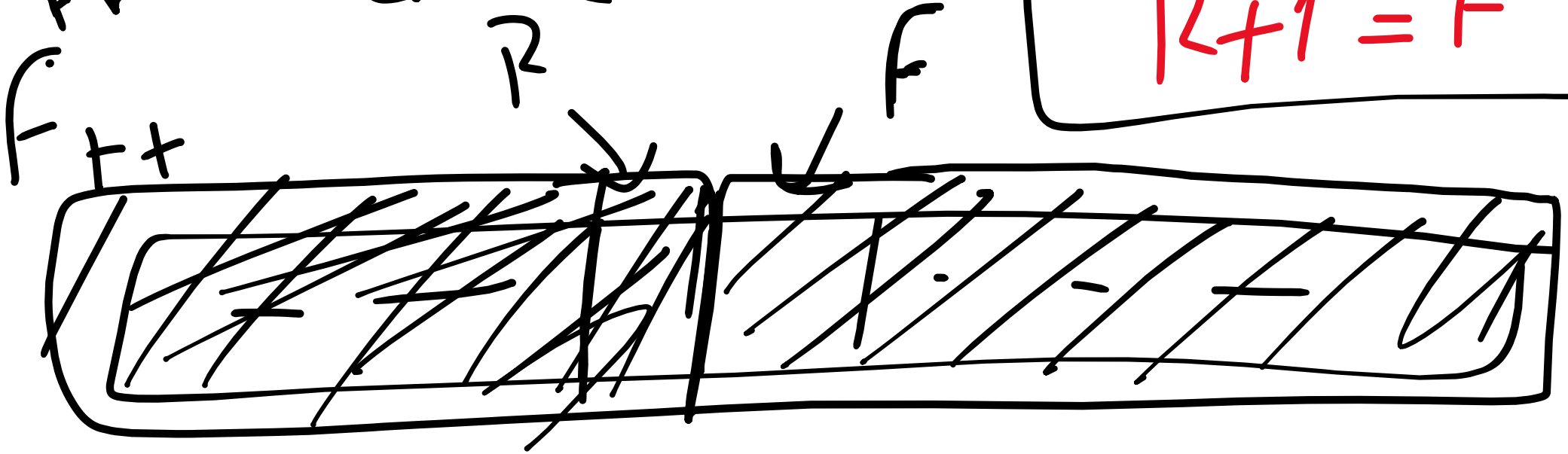
Queue

- → empty
- → circular
- → 1 elem

clear qu



Full

$$R+1 = F$$

$$*\ Prt = \mathrm{Ex}(F)$$