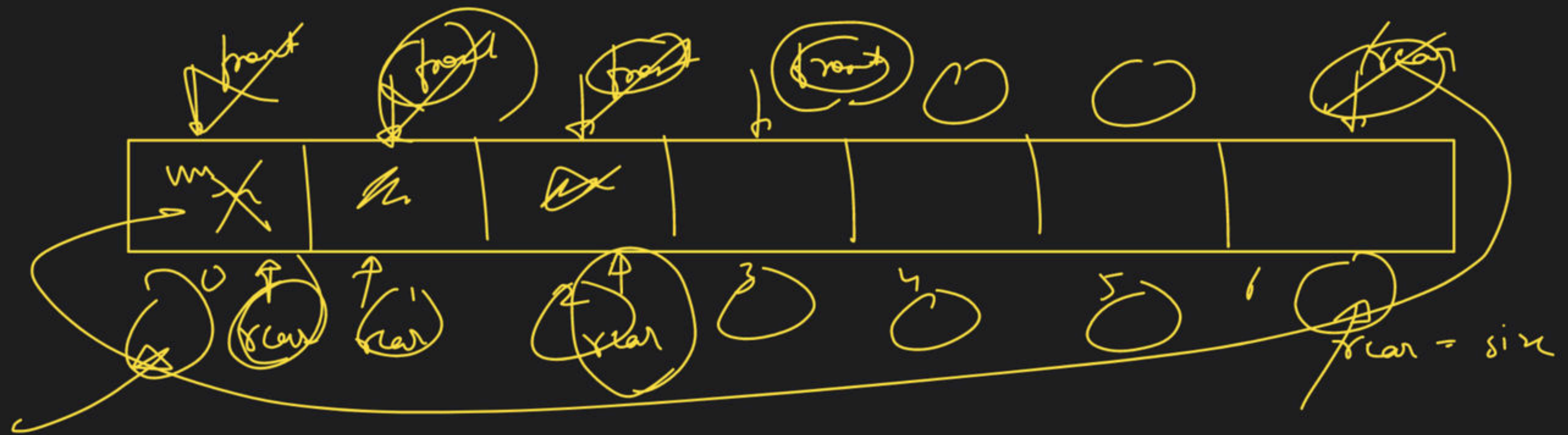


Queue - Class 3

Special class



$(\text{front} = \overset{0}{=} 0 \ \&\& \ \text{rear} = \overset{3}{=} \text{size} - 1)$ → full queue

$\text{rear} = \text{front} - 1$

0

$\text{rear} = (\text{front} - 1) \% (\text{size} - 1)$

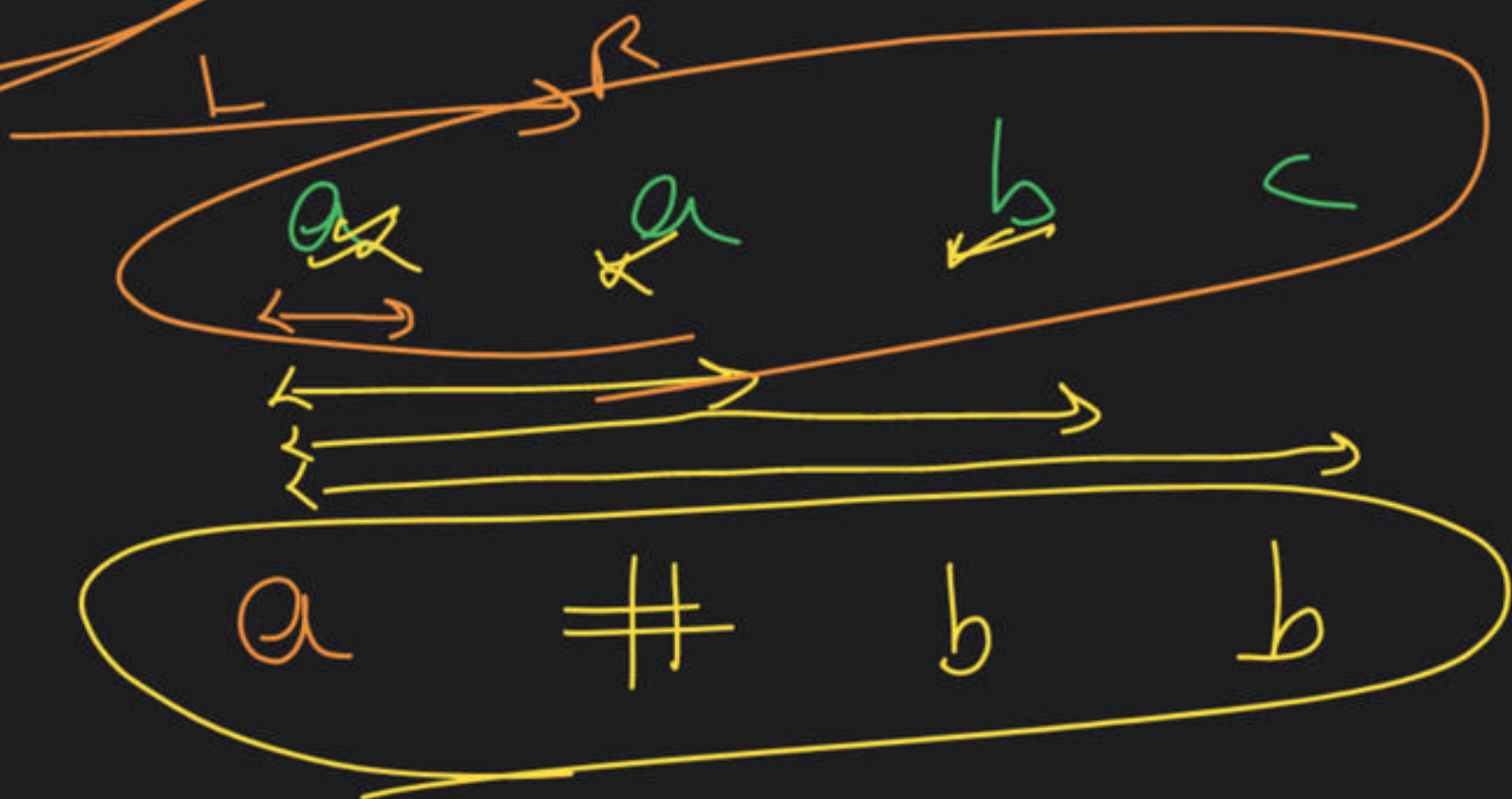
0/2 7

Dry run

→ first non-repeating character in a Stream

Ex 1

repeat na krna hai
i/p



o/p →

a b c d

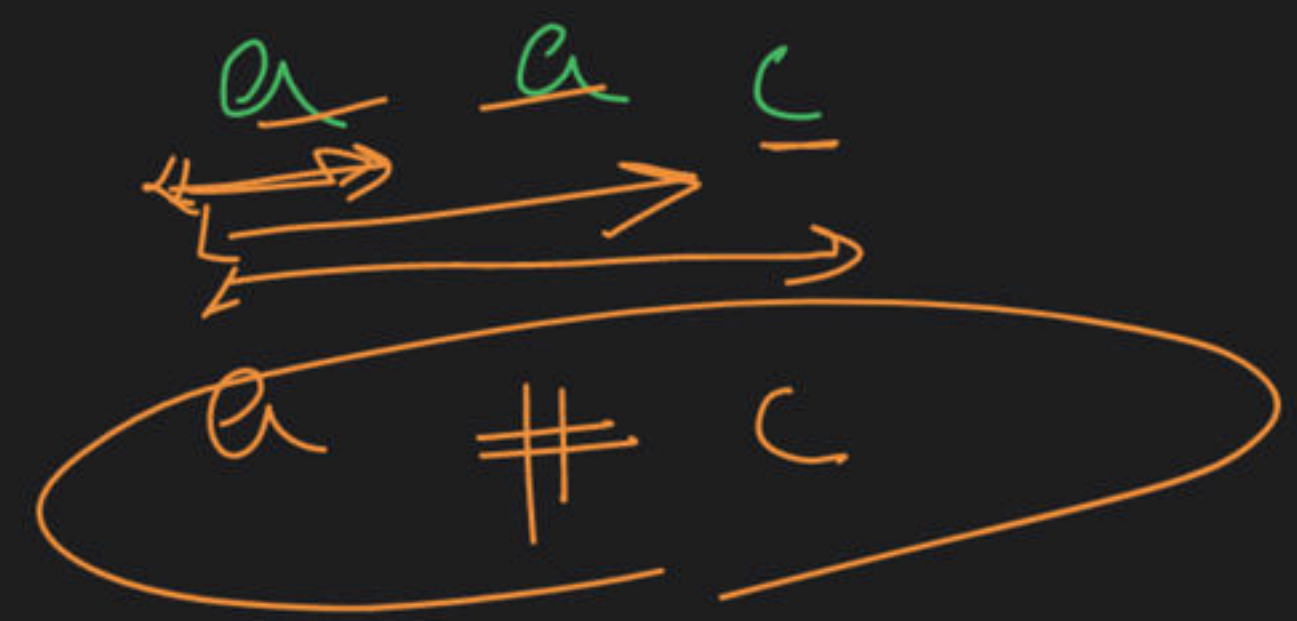
frequency (count)

map <char, int>
array

char → count

i/p

o/p →



a b c d

Approach

How to solve?

if p



z a

y

c

a

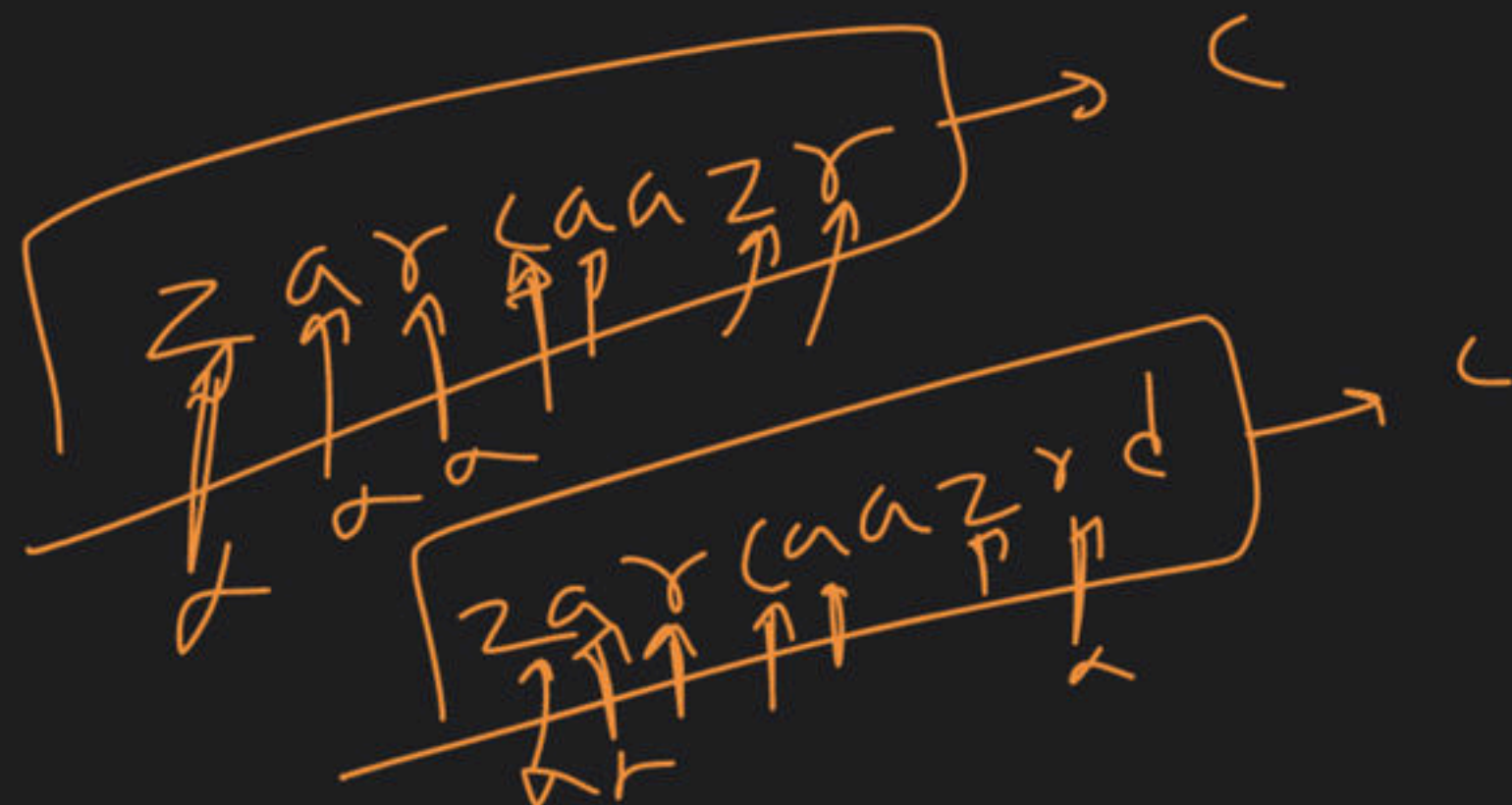
a

z

y

d

z z z z z z y c



z → z

za → z

zay → z

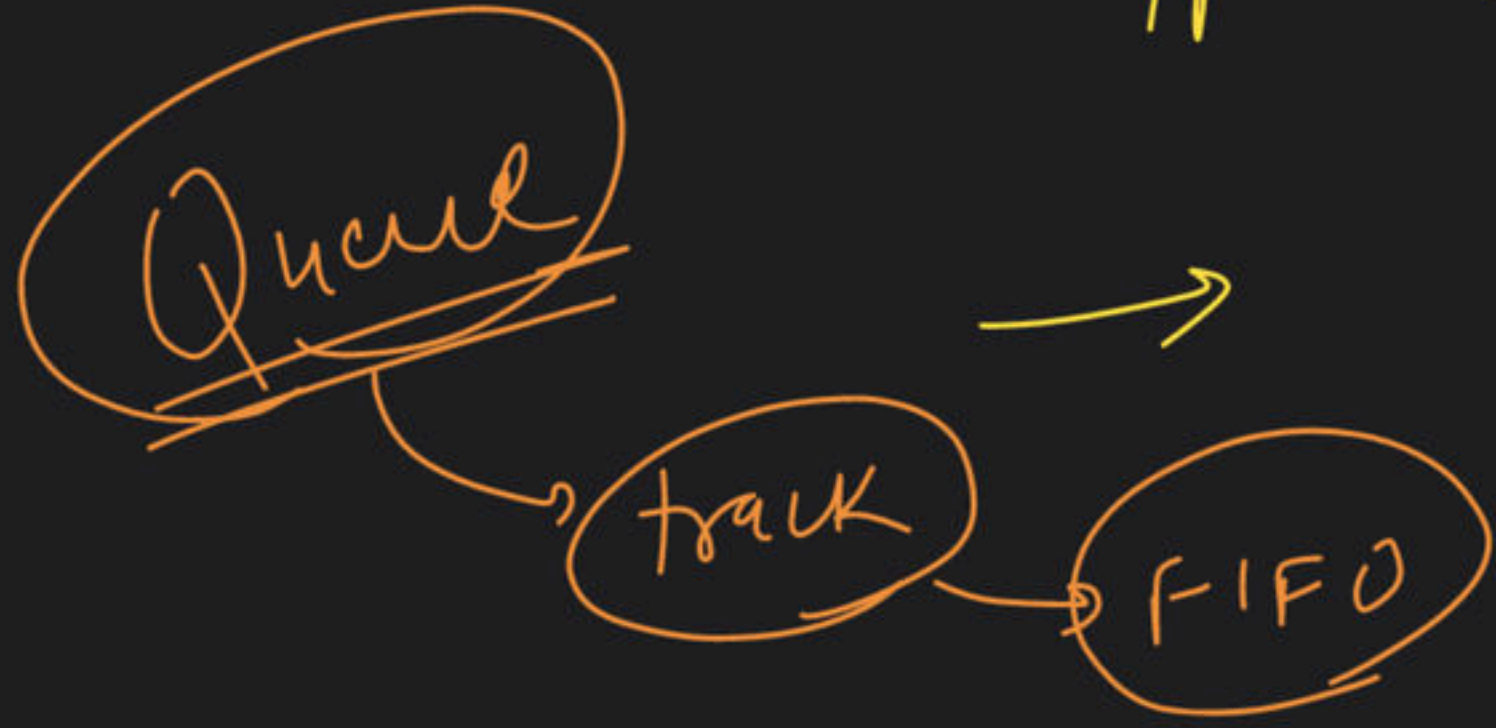
zayc → z

zayca → z

zaycaa → z

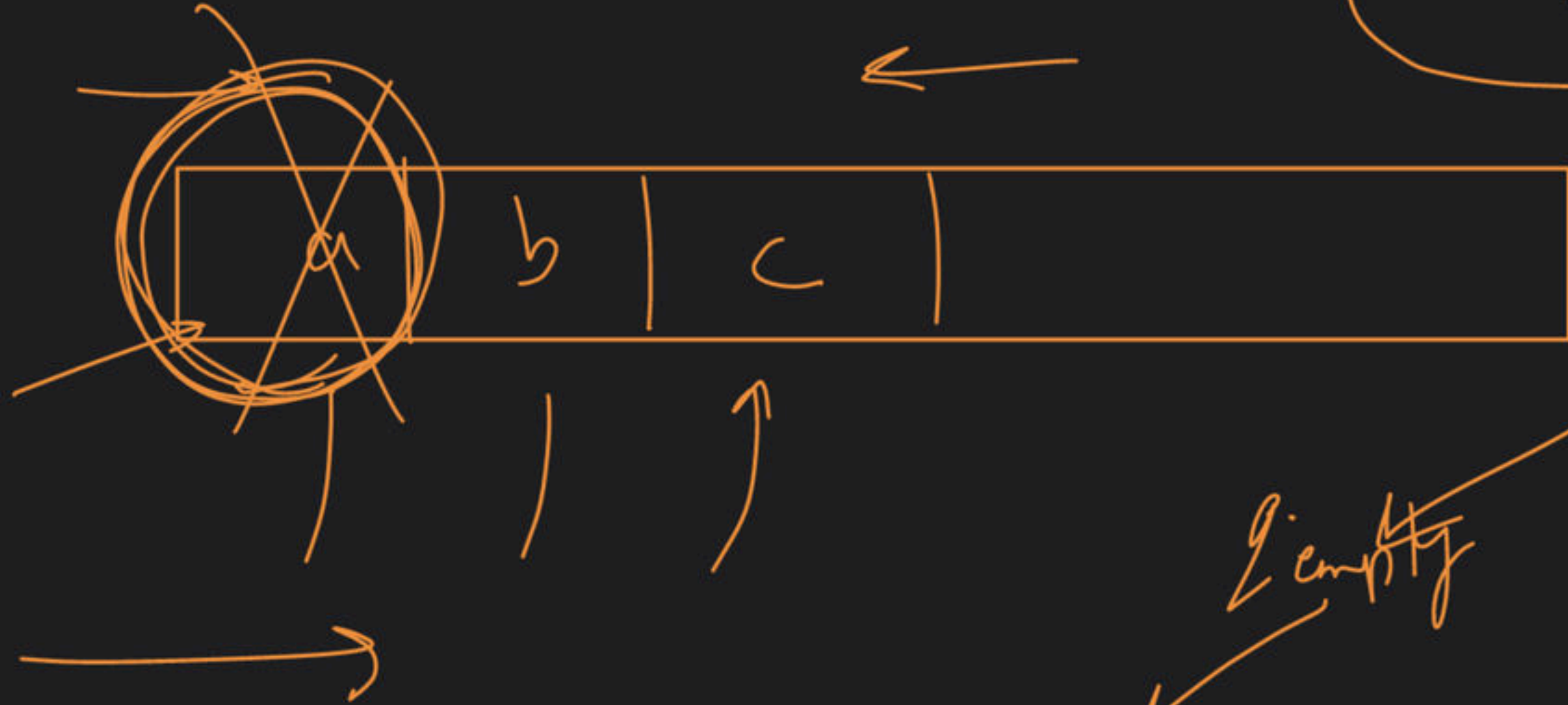
zaycaaz → y

i/p \rightarrow a e b c



freq / count $(++) \rightarrow$ array

q.push(ch)



q.front \rightarrow character

Repeating

pop()

Wsh Repeating

print / stop

q.empty

ans \rightarrow #



```
int freq[26] = {0};
```

'a' ← 0

'b' ← 1

'c' ← 2

'd' ← 3

'e' ← 4

'y' ← 24

'z' ← 25

| |
|---|
| 0 |
| 0 |
| 0 |
| 0 |
| 0 |
| 1 |
| 1 |
| 1 |
| 1 |
| 0 |
| 0 |

freq[kh - a]

$$a - a = 0$$

$$b - a = 1$$

58 - 57

$$c - a = 2$$

59 - 57

$$d - a = 3$$

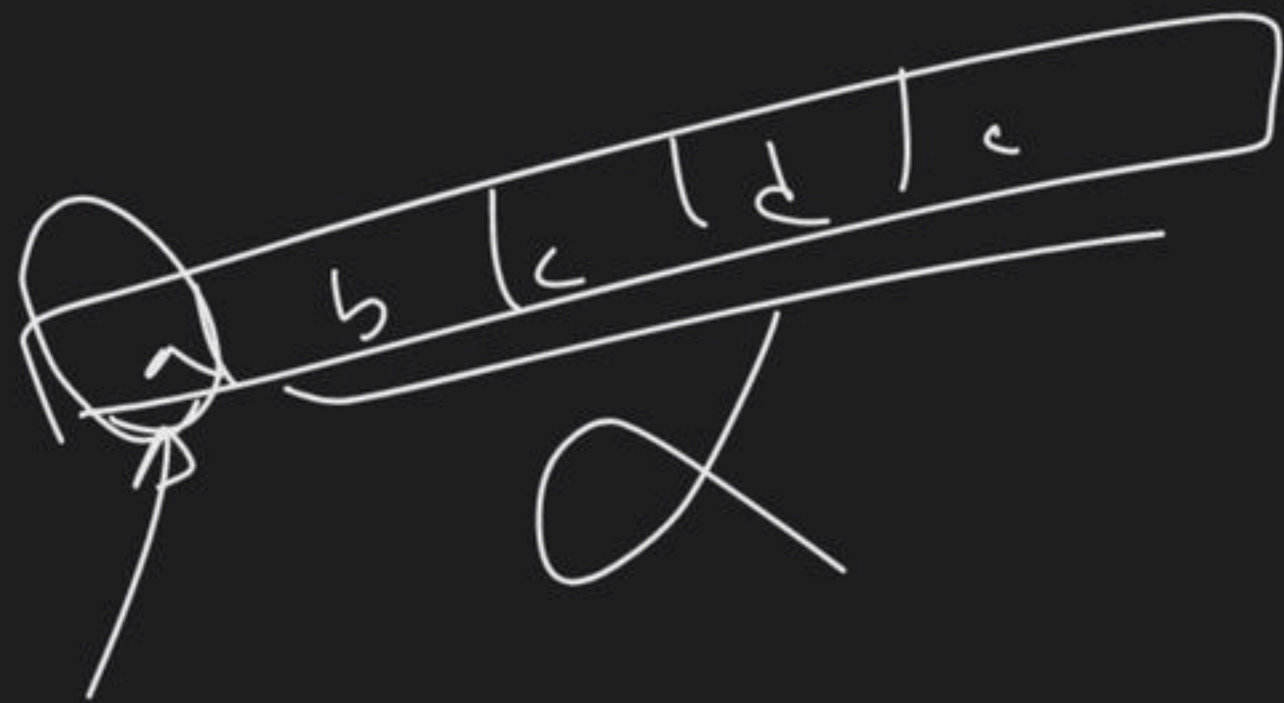
100 - 57

freq['a']

'a' → 97

freq[97]





```
while (!q.empty())
```

```
{  
    // repeating character
```

```
    if (freq[q.front() - 'a'] > 1)
```

```
        q.pop()
```

```
    else  
    {
```

```
        // non-repeating character
```

```
        ans.push_back(q.front());
```

```
        break;
```

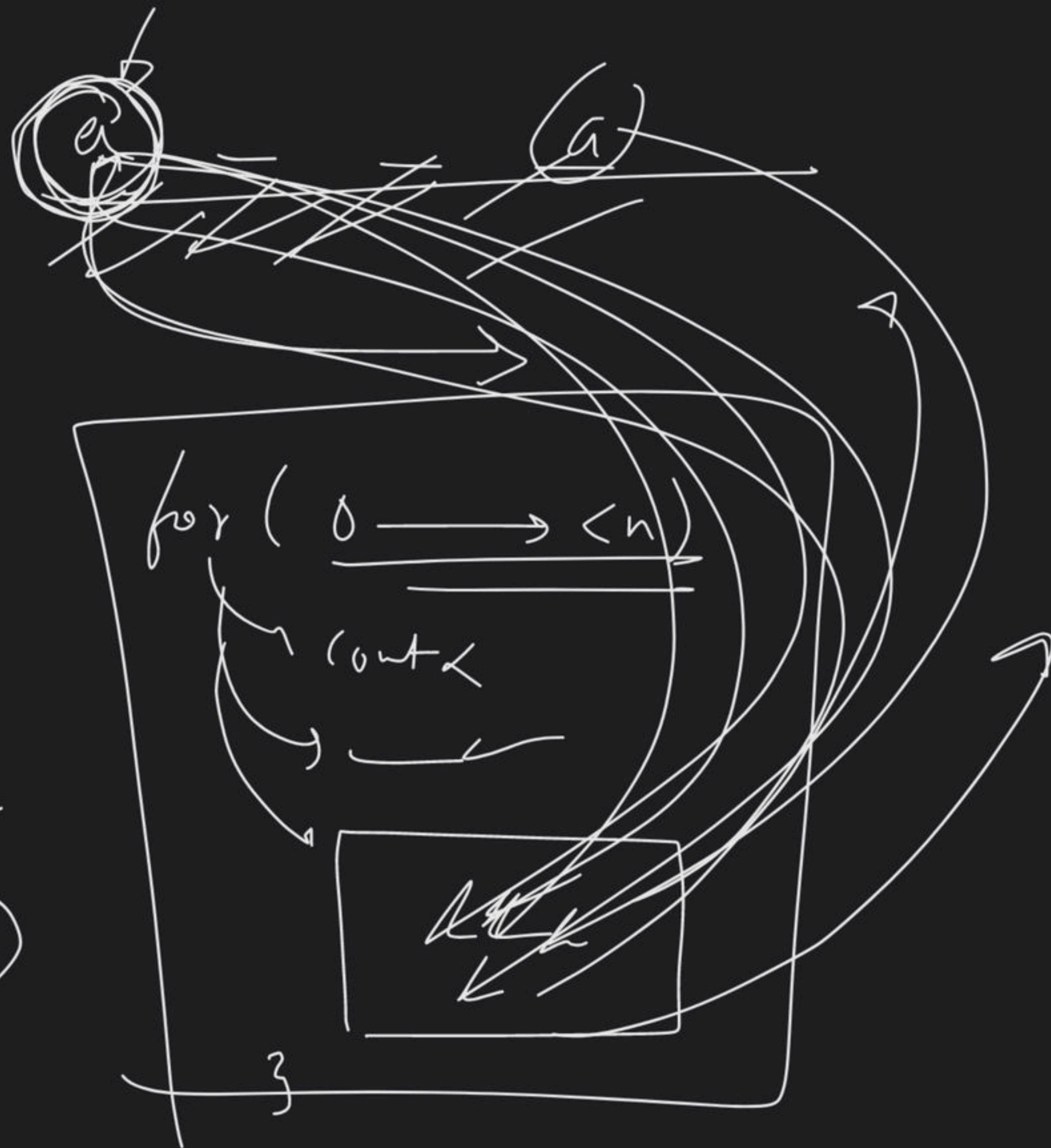
```
    }
```

T.C $\rightarrow O(n)$

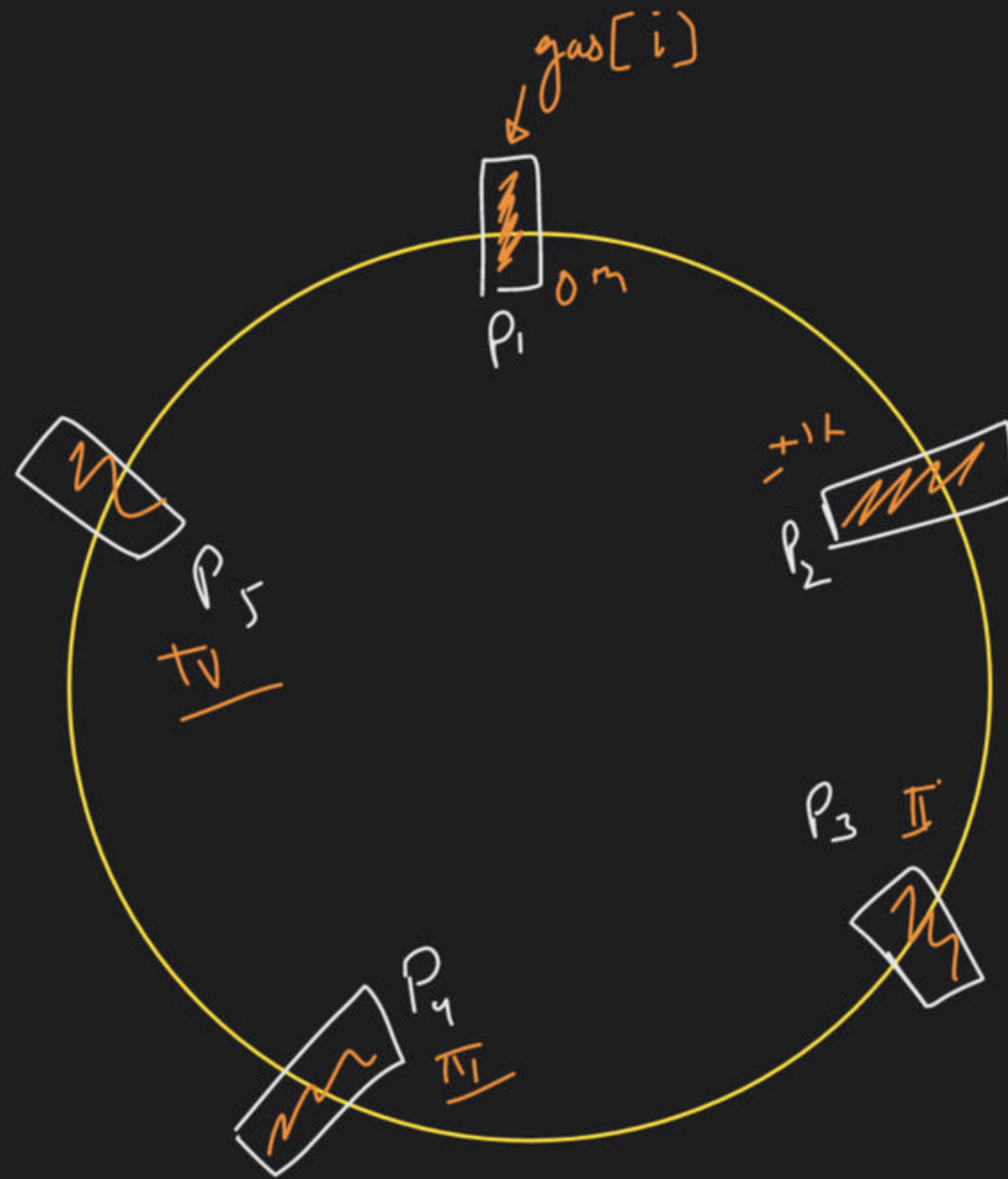
S.C $\rightarrow O(1)$

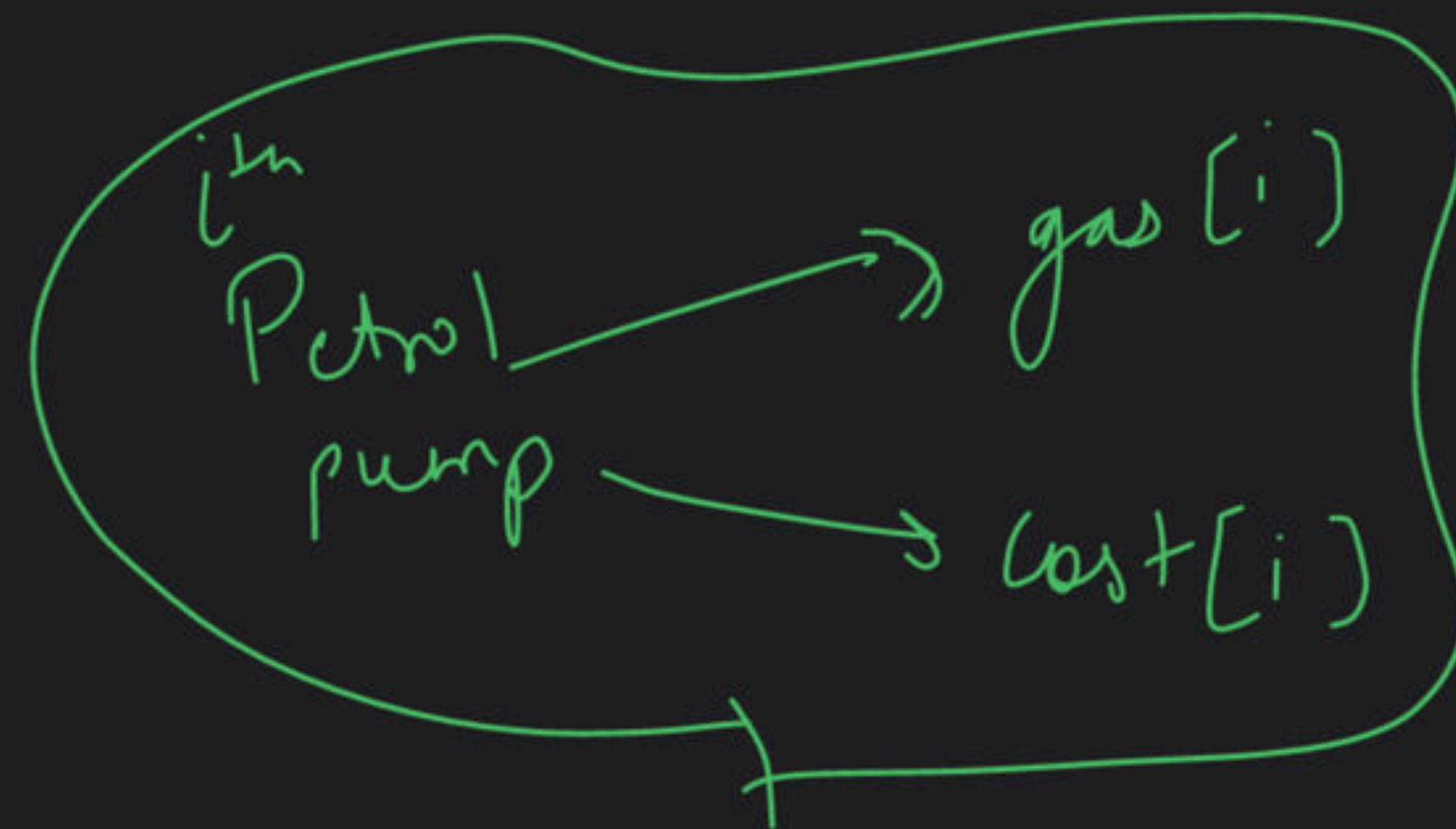
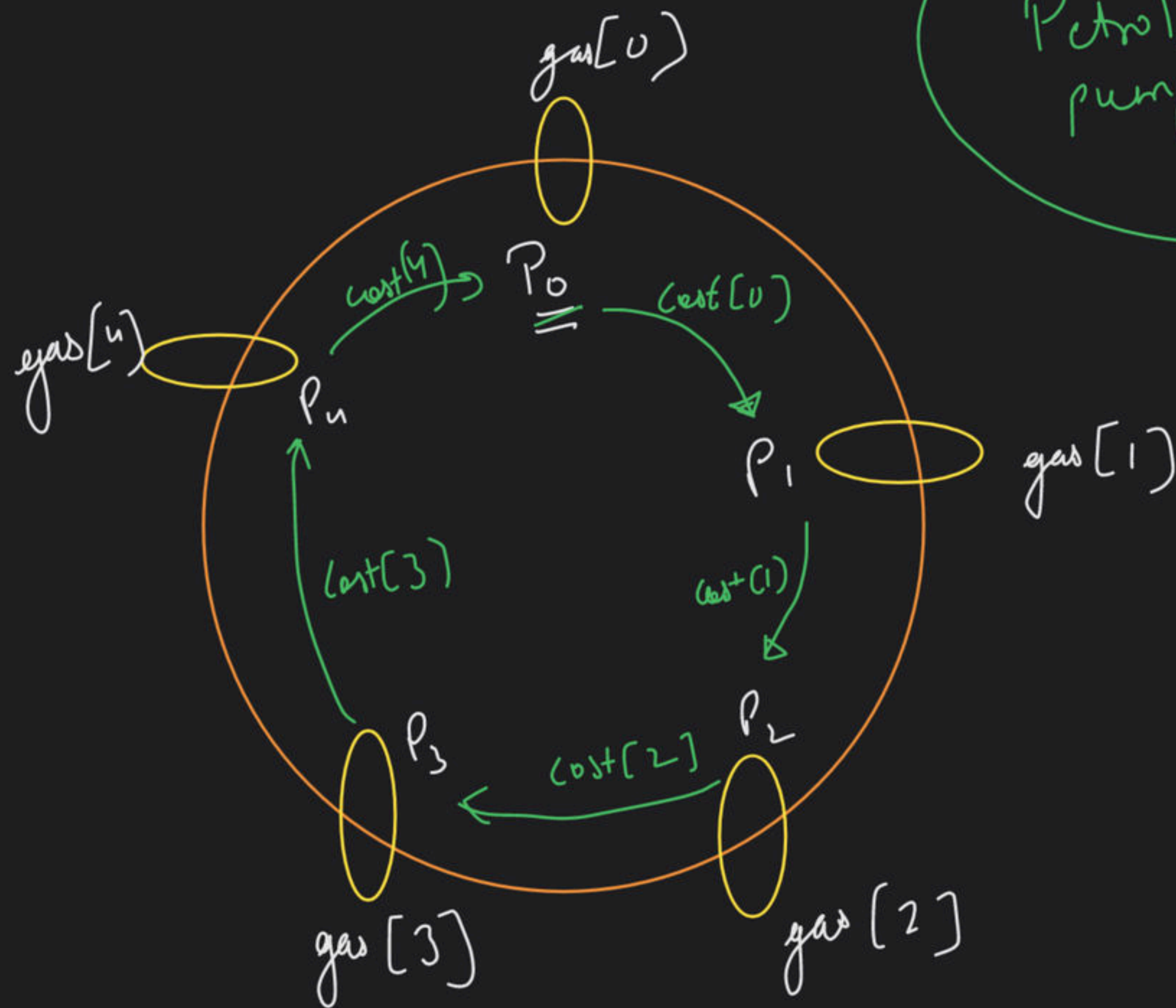
arr[26]
 α
 $O(26)$
 $O(1)$
 constant

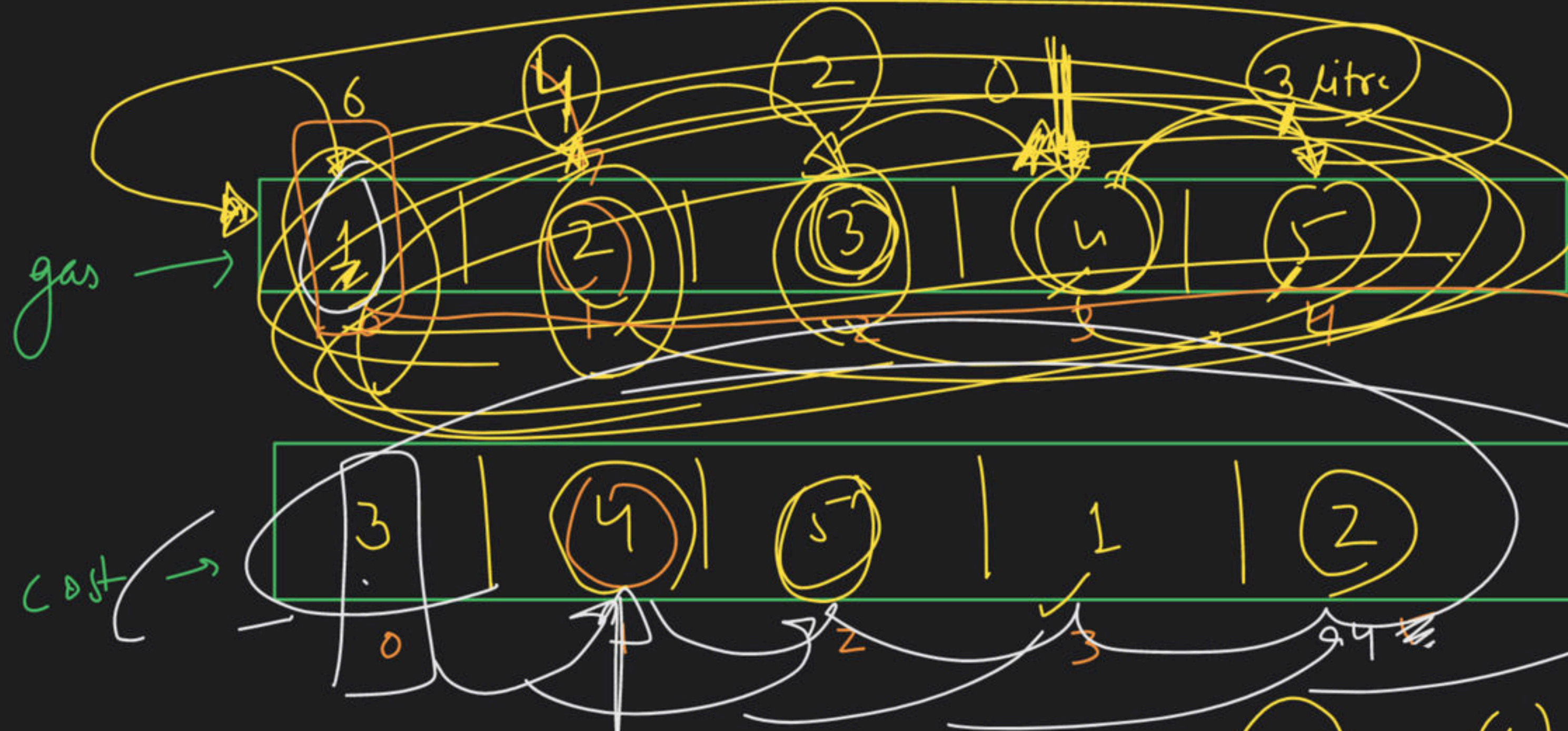
queue
 $O(n)$



→ Circular tour / Gas Station







1 litre → 1 km

$P - d \geq 0$

#1

2 loop

$O(n^2)$

balance = 4
dist = 1

8 → 2 → 6

bal → 7
dist = 3

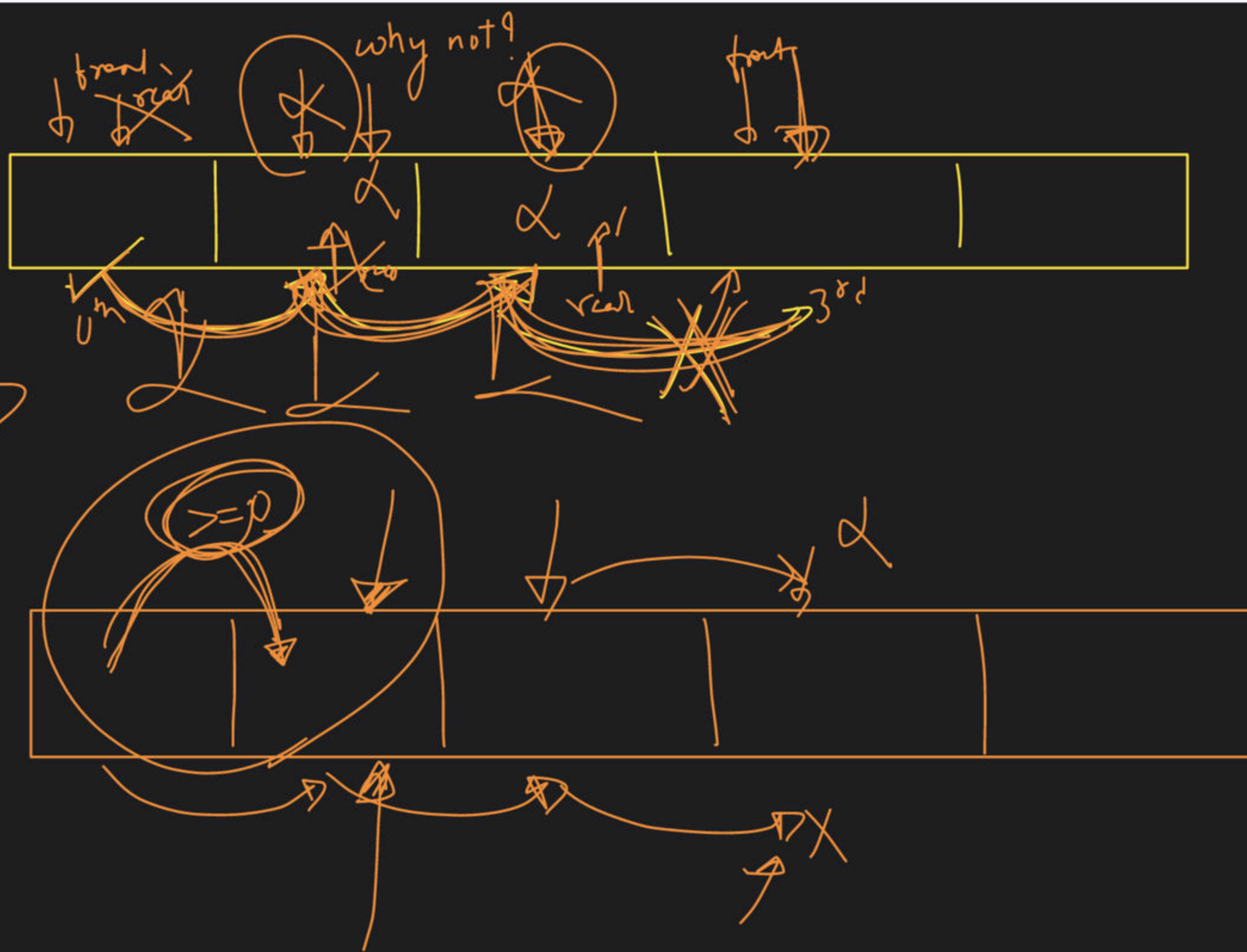
return 3
↓
valid karoge

0th → 4 → (n-1)
1st → (n-1)
2nd → (n-1)

2 + 3 = 5
3 + 2 = 5
4 + 1 = 5

$n \times (n-1)$
→ n^2

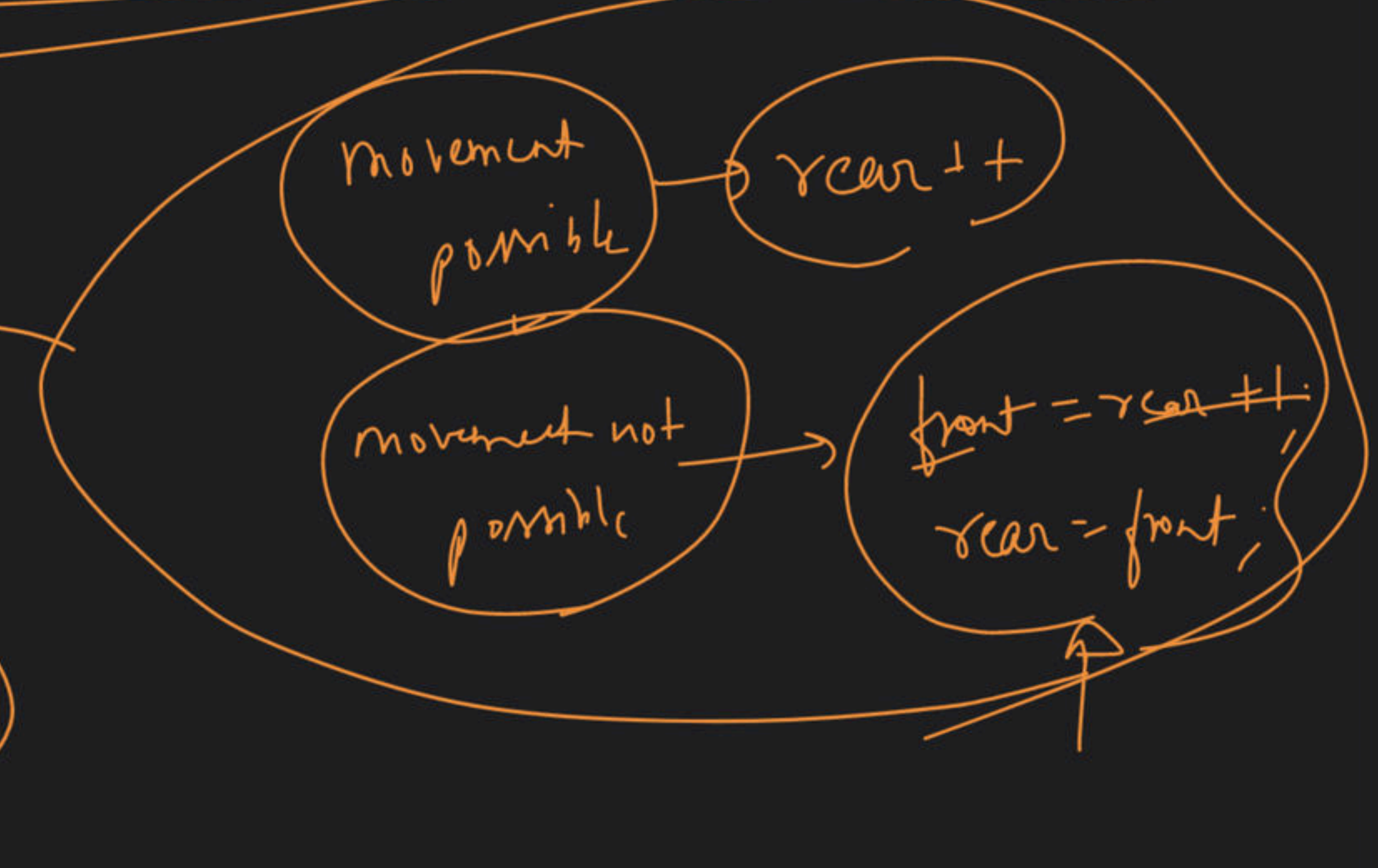
queue
concept





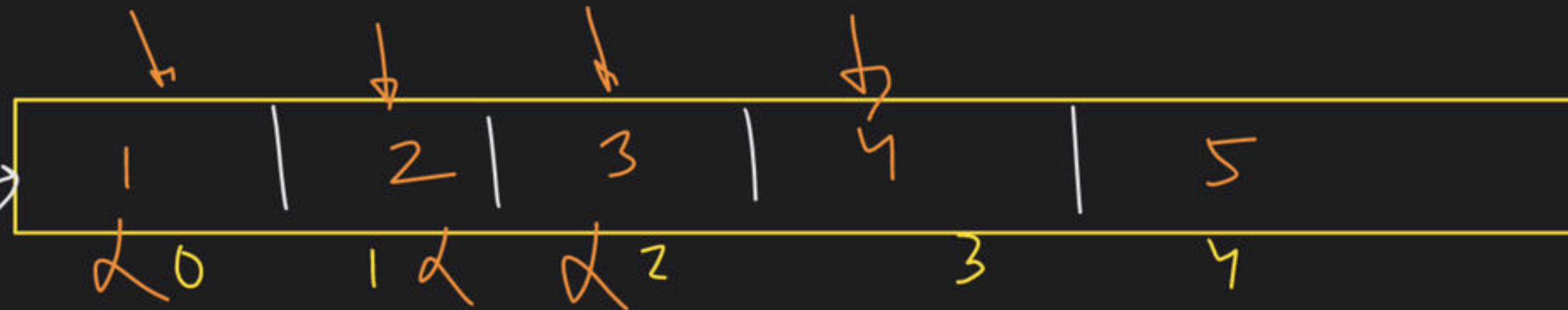


Circle complete
 hogya \leftarrow
 $front == rear$
 Circle complete
 hogya

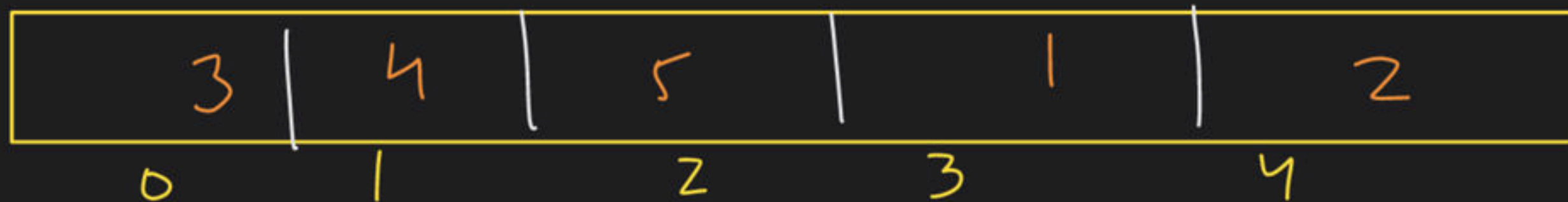


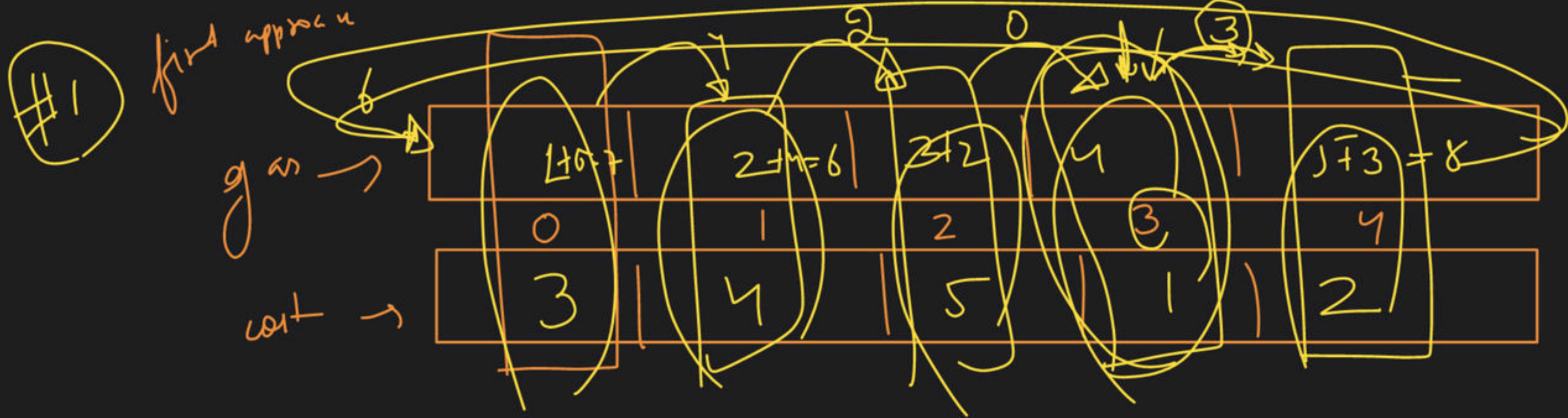
#2

gas



cost





B.F

0th → P=1, D=3, P-D = -2 >= 0 → **F**

1st index → P=2, D=4, P-D = -2 >= 0 → **F**

2nd index → P=3, D=5, P-D = -2 >= 0 → **F**

3rd index → P=4, D=1, P-D = 3 ✓

P=8, D=2 → 6

P=7, D=3 → 4

P=6, D=4 → 2

P=5, D=5 → 0

$P_n \rightarrow P_y$

↳ moves possible

↓

Petrol - distance >= 0

#2



#3

gas →

cost →

| | | | | |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| 3 | 4 | 5 | 1 | 2 |
|---|---|---|---|---|

loss = 30
Profit = 50

$$-30 + 50 = +20$$

balance

$$\text{deficit} = (p - d)$$

-3

4 litre

deficit

balance --

$$\text{balance} + \text{deficit} \geq 0$$

balance

deficit

is not

NU

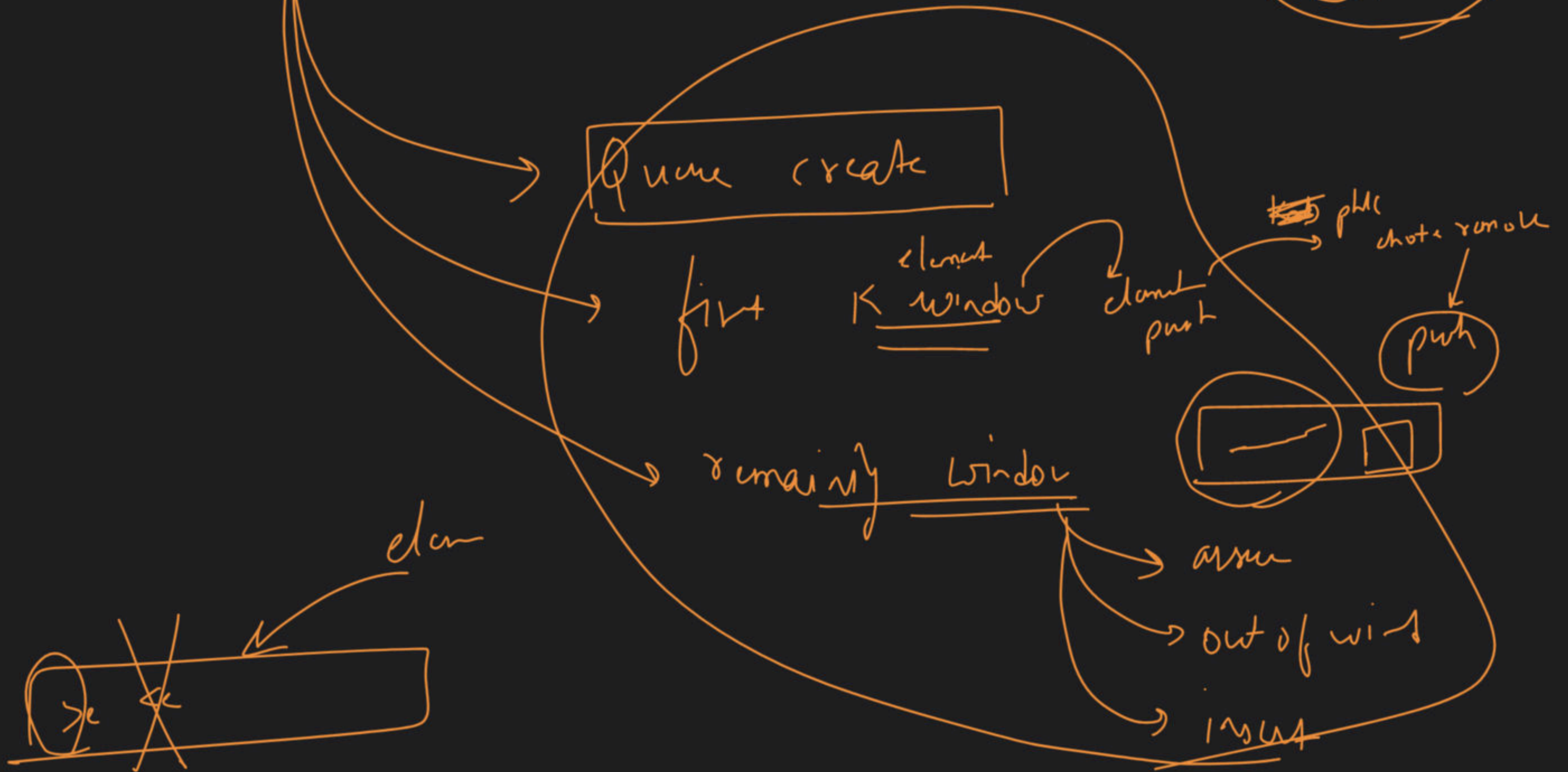
is not

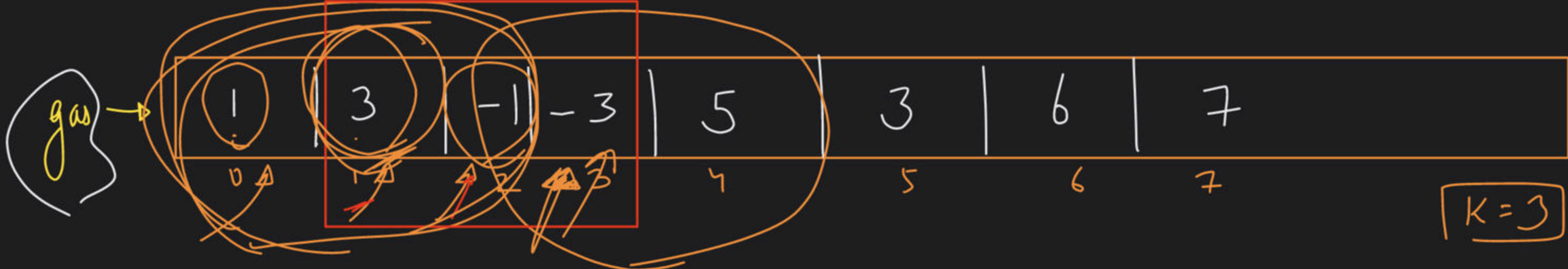




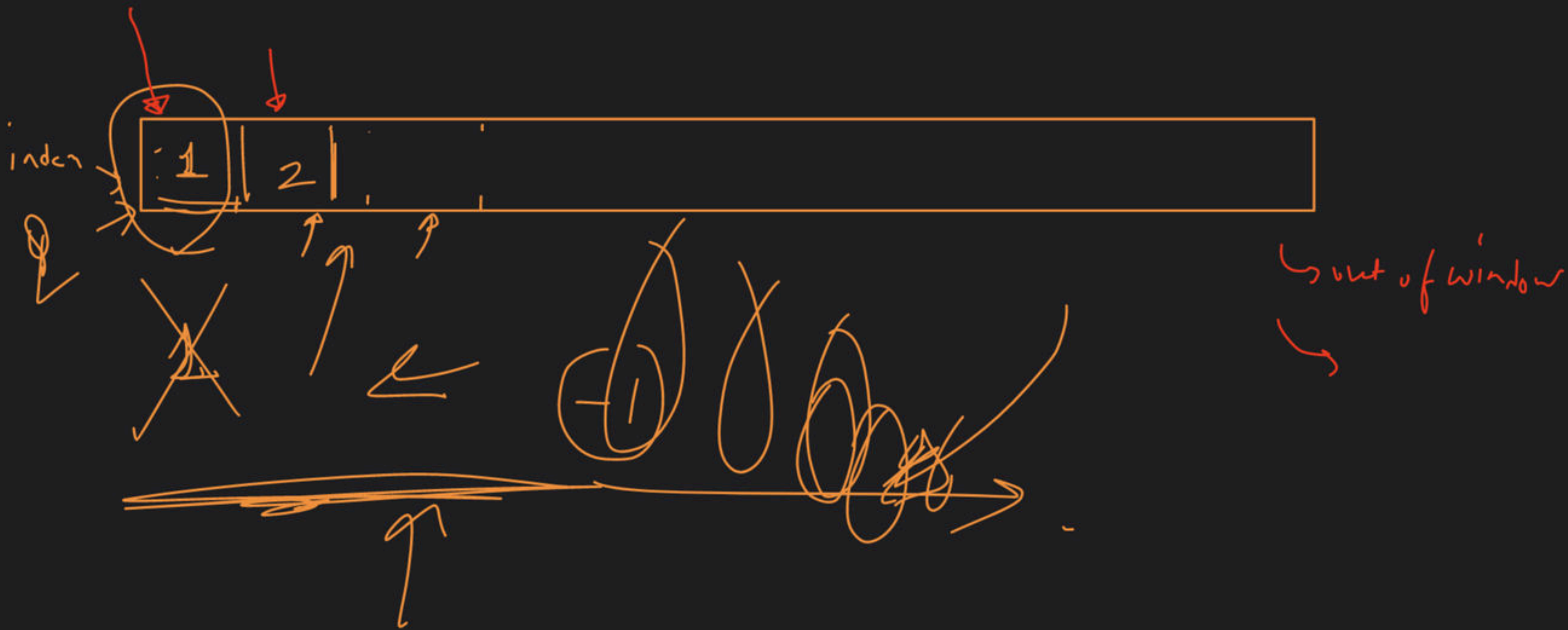
Sliding Window Maximum

1 min
Break

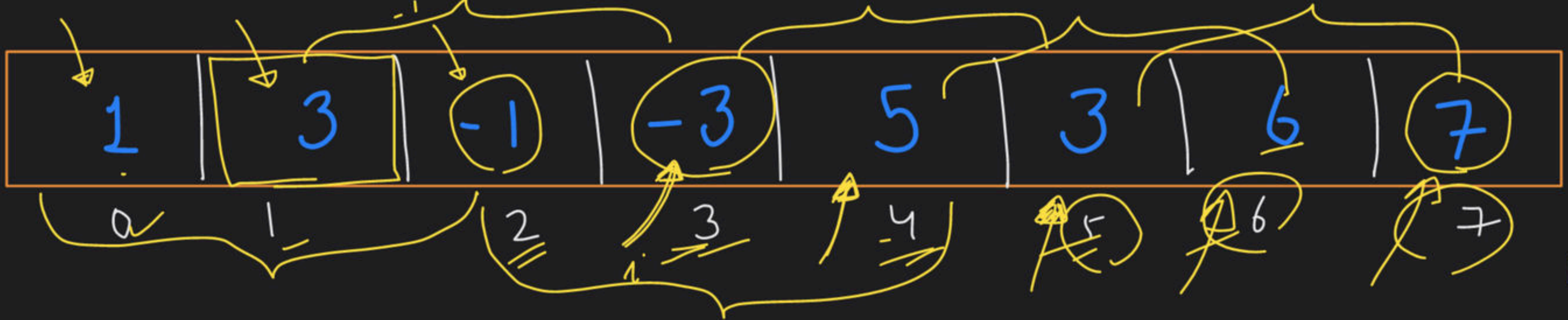




3,



arr



del



ans



① Implemented