



BackTracking BONUS Session

Special class

→ Letter tile possibilities :->

"A A B"

off-limits → LK
exp →

The Last Call

15-20 min

"V"

len = 1

V

①

$a \mapsto 0$

len = 1

A

B

len = 2

A B

B A

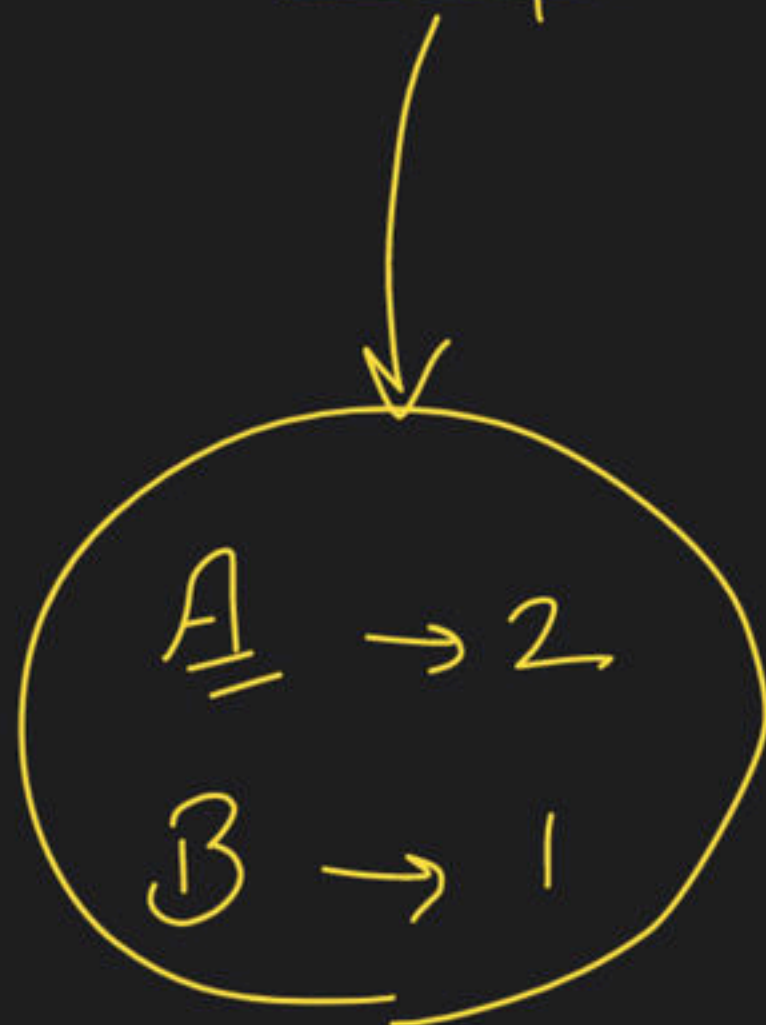
A A

len = 3

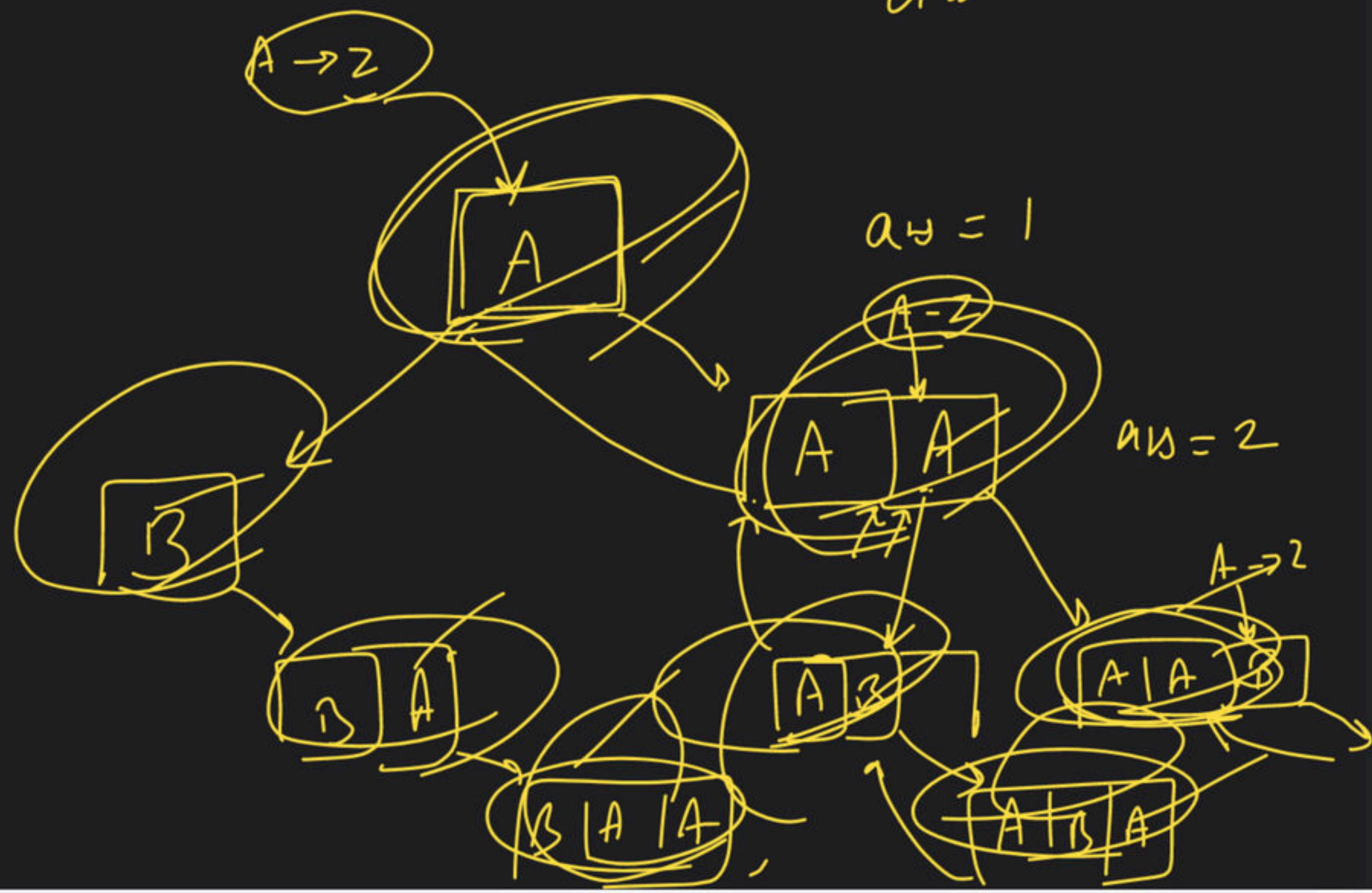
A A B

A B A

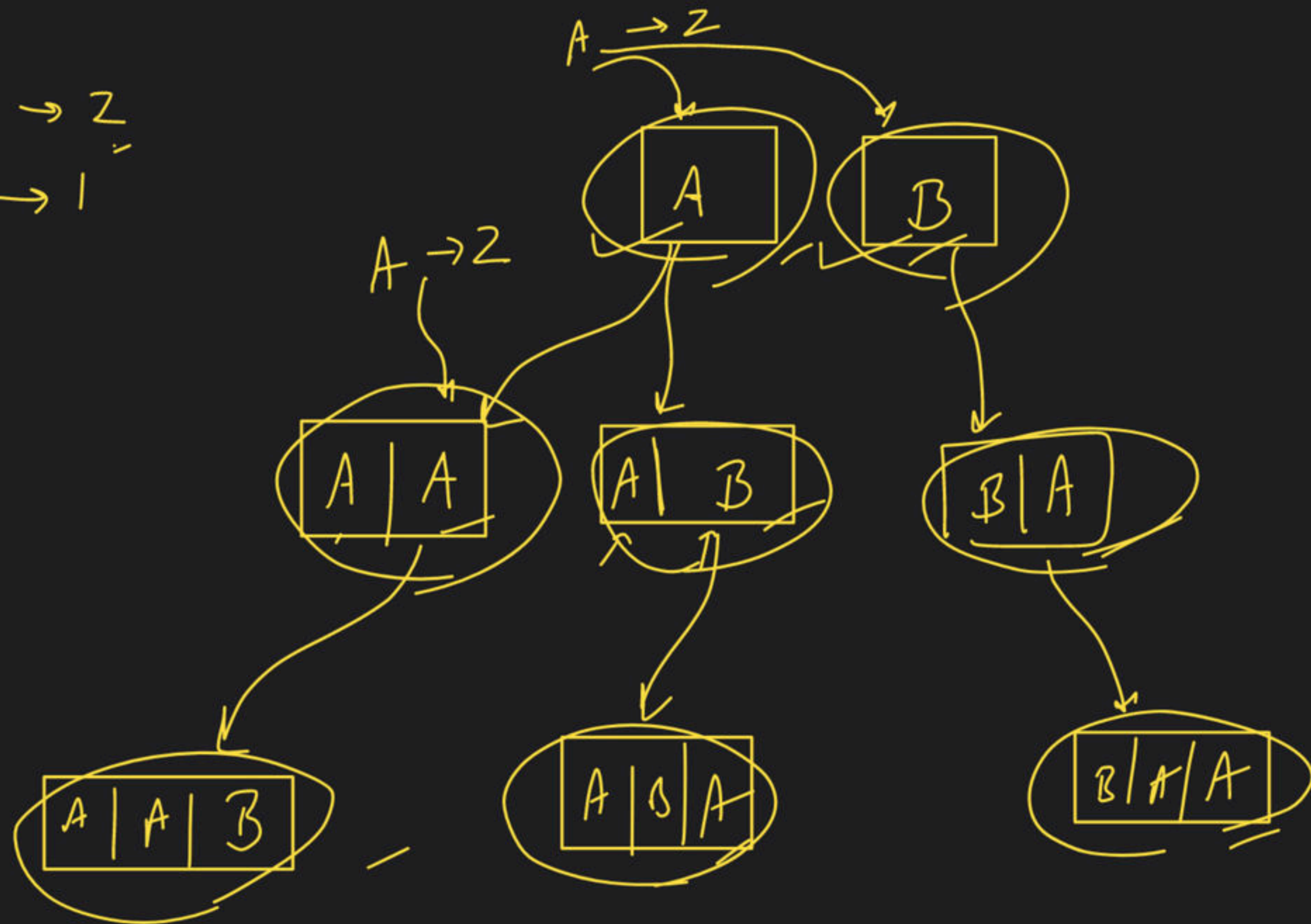
B A A



Sequence count $av \geq 8$



$A \rightarrow Z$
 $B \rightarrow 1$



→ D.E show

Phone Keypad Problem

↳ i/p →

string
"23"
2 → 9

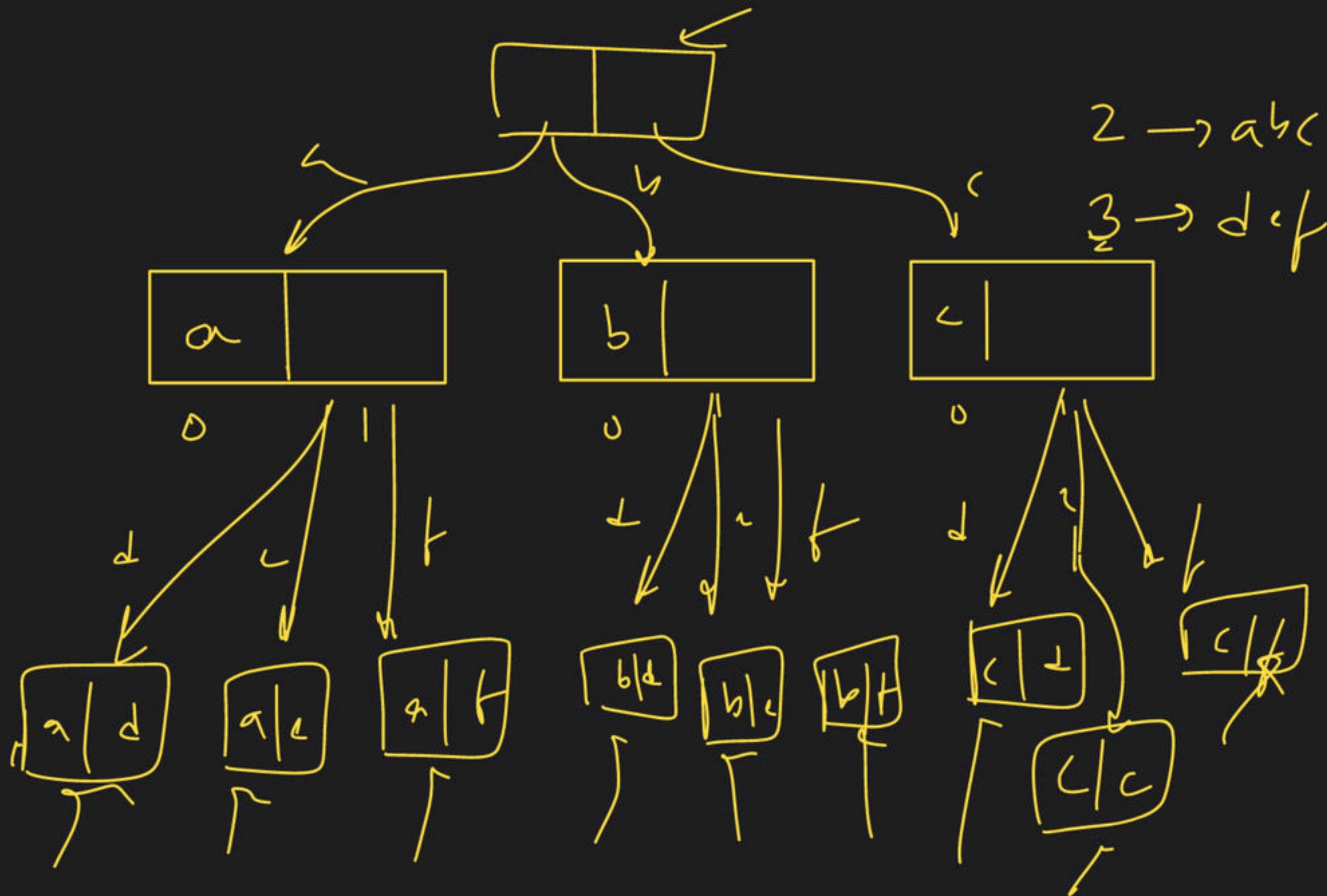
	2 abc	3 def
4 ghi	5 jkl	6 mno
7 pqrs	8 tuvw	9 xyza

2 → abc
3 → def

2 → a a a b b b
3 → d c f d c f
f f f

i/p → 2 3

min
Brack



explore all comp in/ex

~~() () () ()~~

DS

Set

() () () → duplicate

() () () →

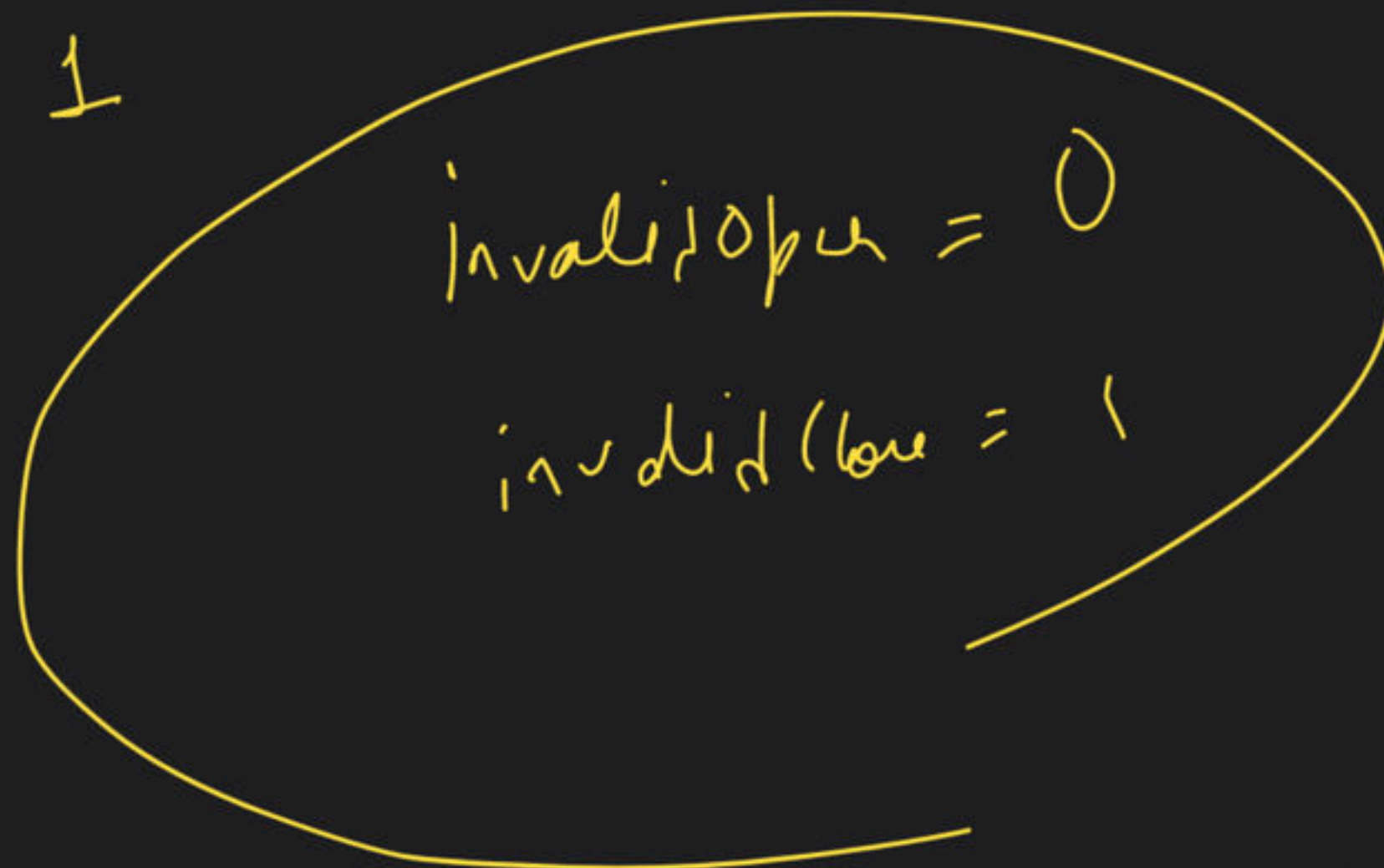
valid

()
open close

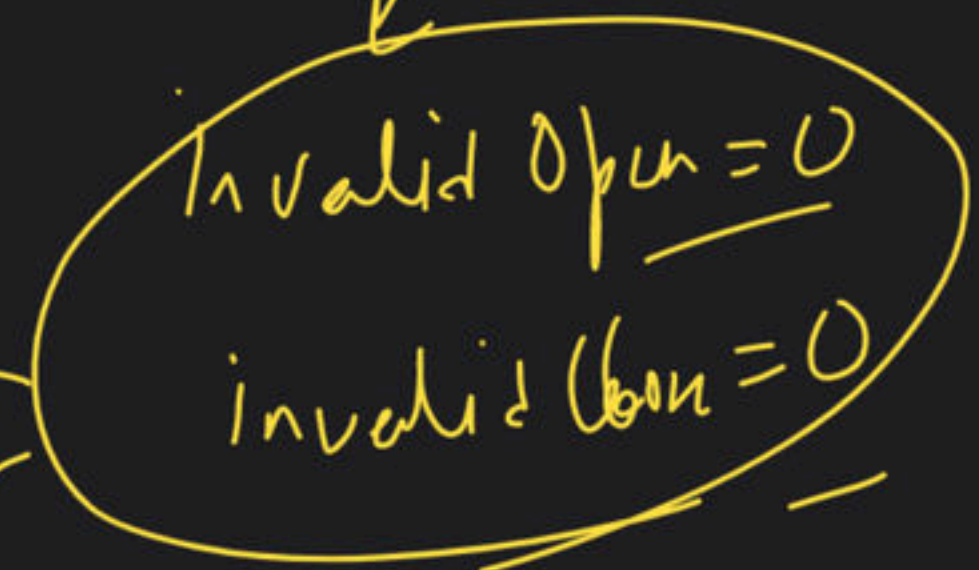


invalid Open \rightarrow ~~X~~ / ~~O~~ / ~~X~~ / ~~O~~ / ~~X~~ / ~~O~~

invalid Close \rightarrow 1

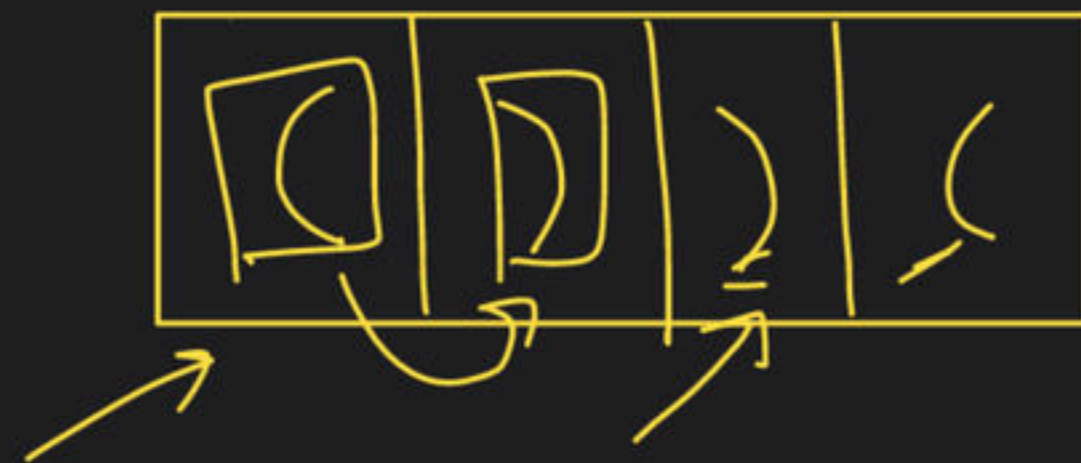
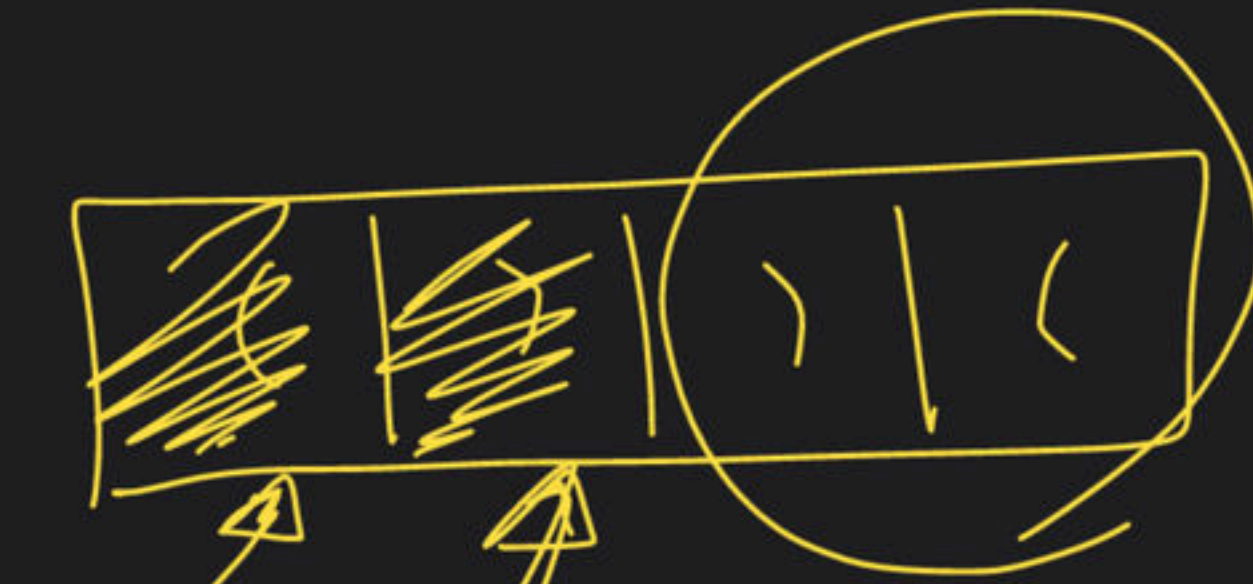


Valid
exp \rightarrow



every opening
bracket has a \leftarrow closed bracket
bal = 0

Length to be \neq fail



invalid open → ~~X~~ ~~0~~ ✓
invalid close → ~~X~~ 0 ✓

Balanced
Valid ✓

) (→ (bal = 1)
✓

condⁿ → Valid
Exp



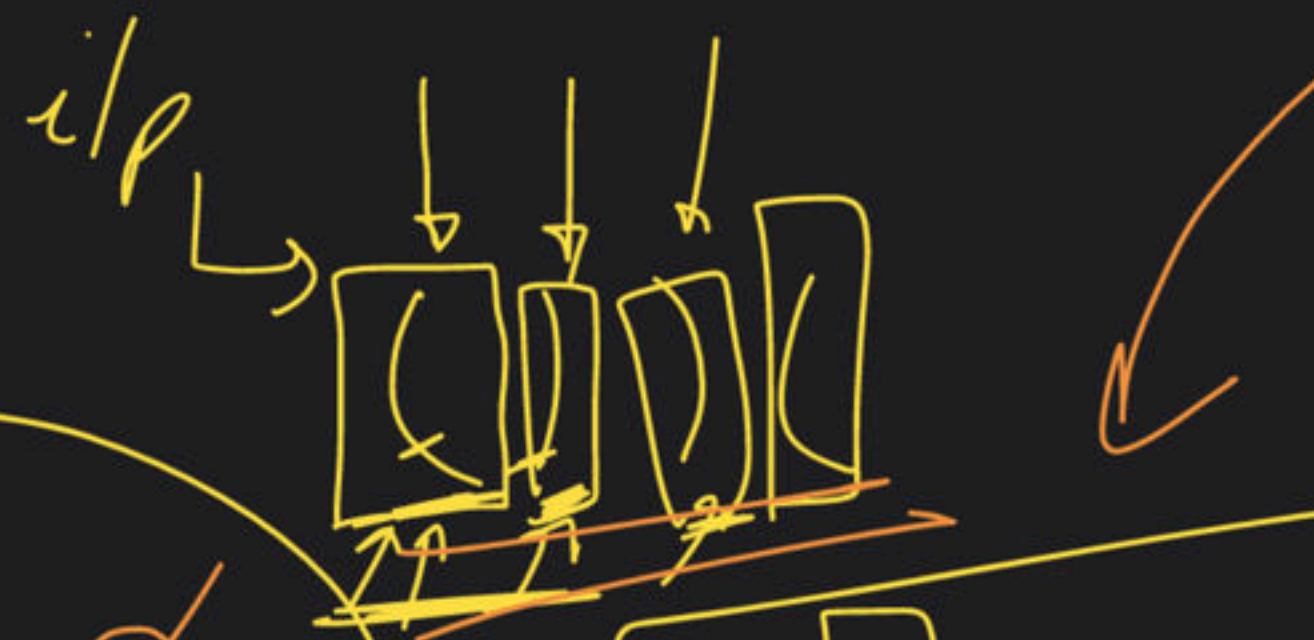
invalid Op = 0.
invalid base = 0
bal = 0

(→ bal → 1
=) → bal → 0
) → bal → 0
(→ bal - 1

(→ bal++
) → bal--

without
opening
break
) → bal

Handwritten diagram illustrating a concept. It features a rectangle with a diagonal line through it, a vertical line, and a circle with an arrow pointing to the text "Not Valid".



bal = 1

invalid Open \rightarrow ~~0~~ ~~1~~ 0

invalid Closed \rightarrow ~~0~~ ~~1~~ 0

Handwritten diagram illustrating a state transition for a balanced parentheses problem:

- Initial State (Left):** A large oval containing:
 - $balance = 0$ ✓
 - $invalid\ op = 0$ ✓
 - $invalid\ (br = 0$
- Transitions:**
 - Three arrows enter the initial state from the left.
 - One arrow exits the initial state to the right, pointing to the 'Valid' state.
 - Below the initial state, the text "br > 0" is written with an arrow pointing towards the state.
 - Below the initial state, the text "15" is written.
- Final State (Right):** A smaller oval labeled Valid with double underlines.

Balance → no. of open brackets without close brackets

$\overline{()}$ \rightarrow invalid op + 1

) → invalid open > 0

↓
invalid op

) \rightarrow without open

invalid point

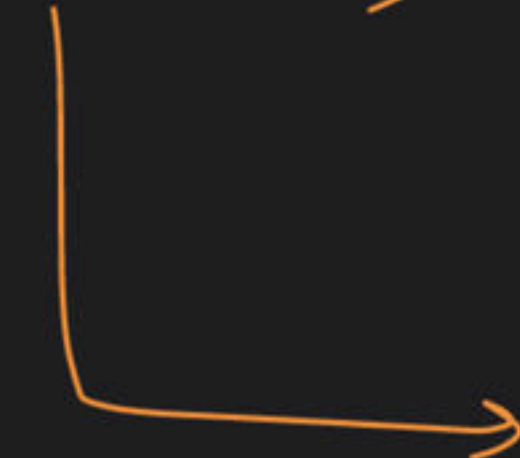
balance



" ("



bal++



) "



bal--

)

previously invalid open

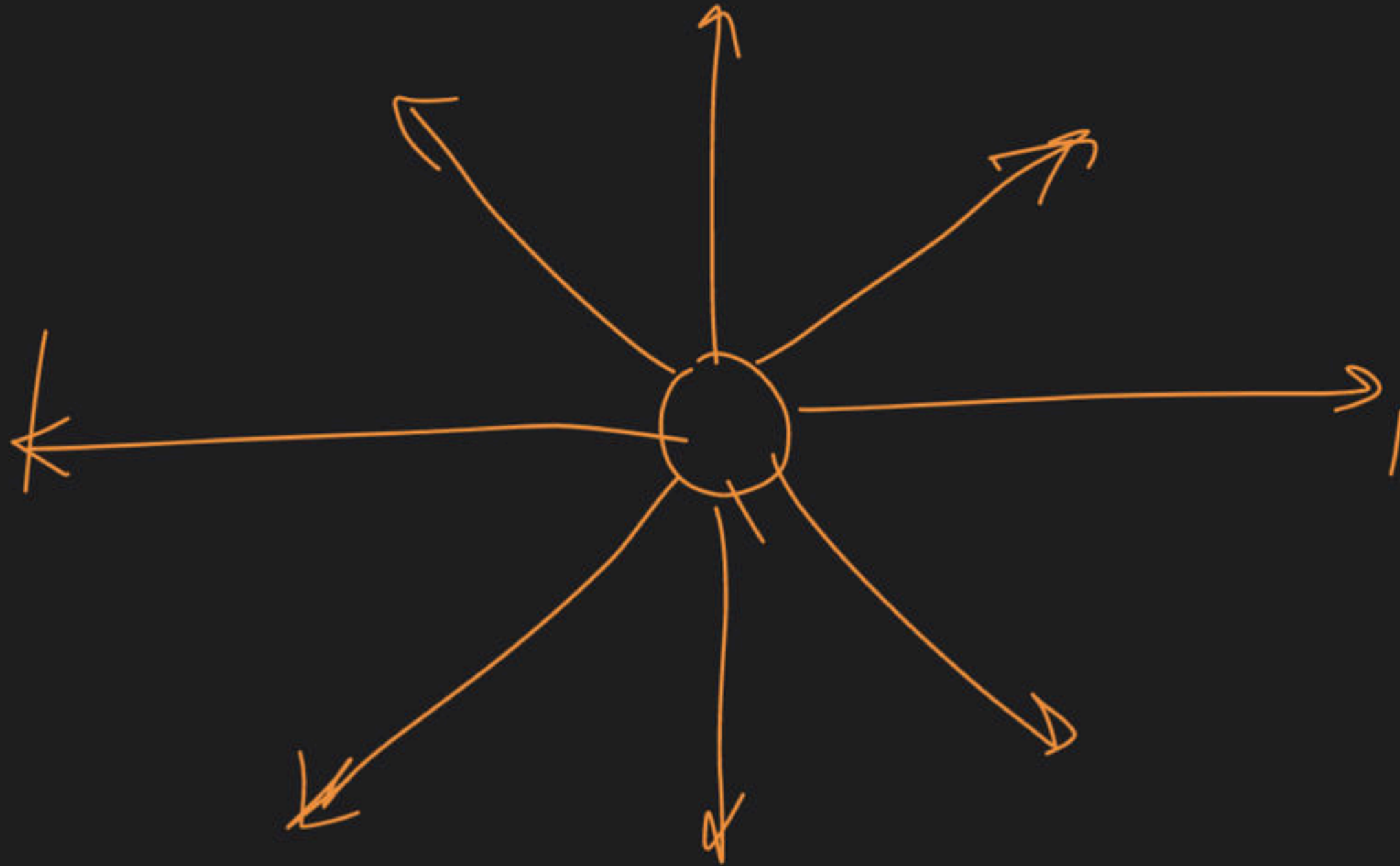


bal--



N-Queens

chus



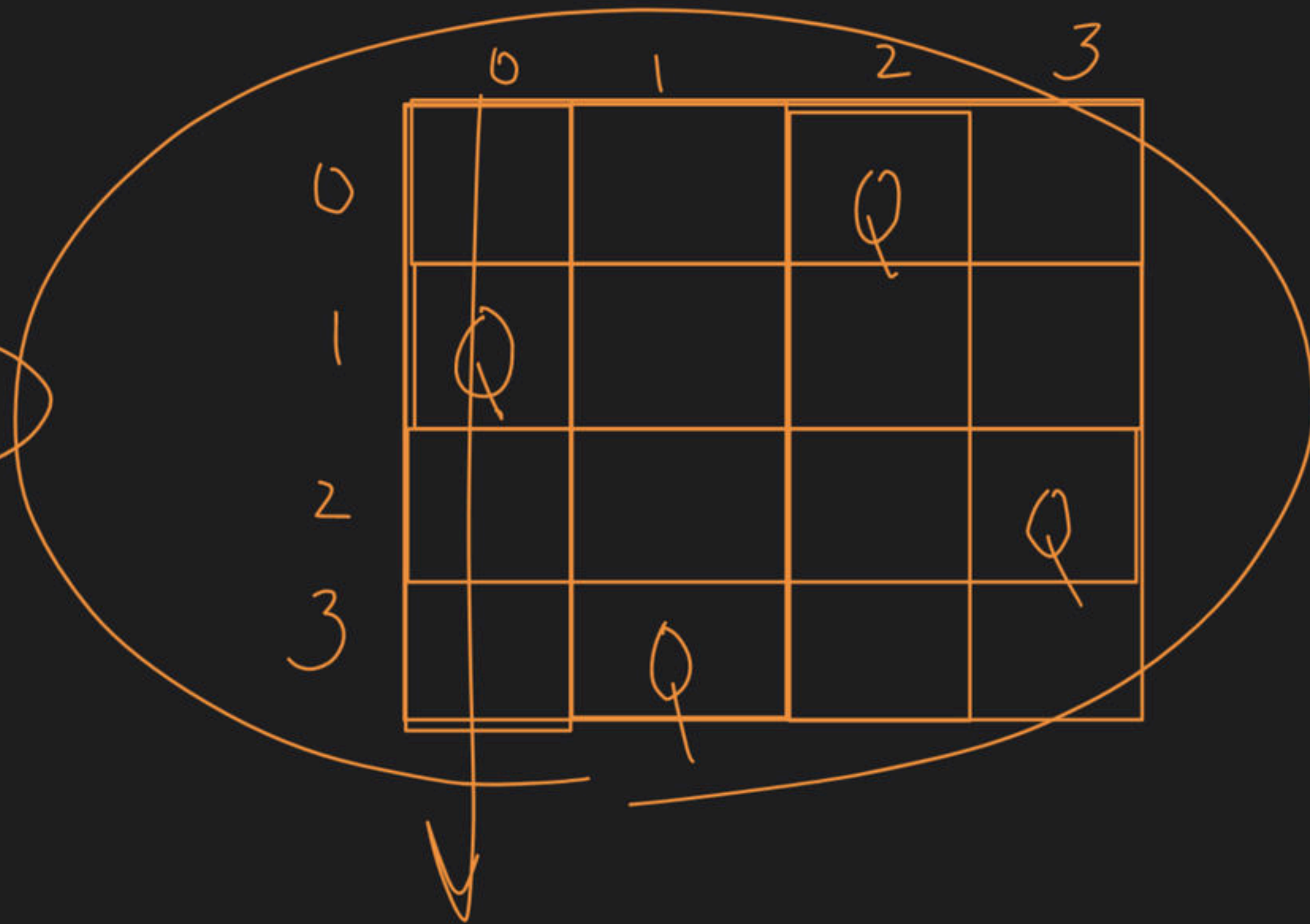
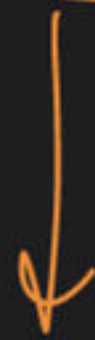
2 min
Break

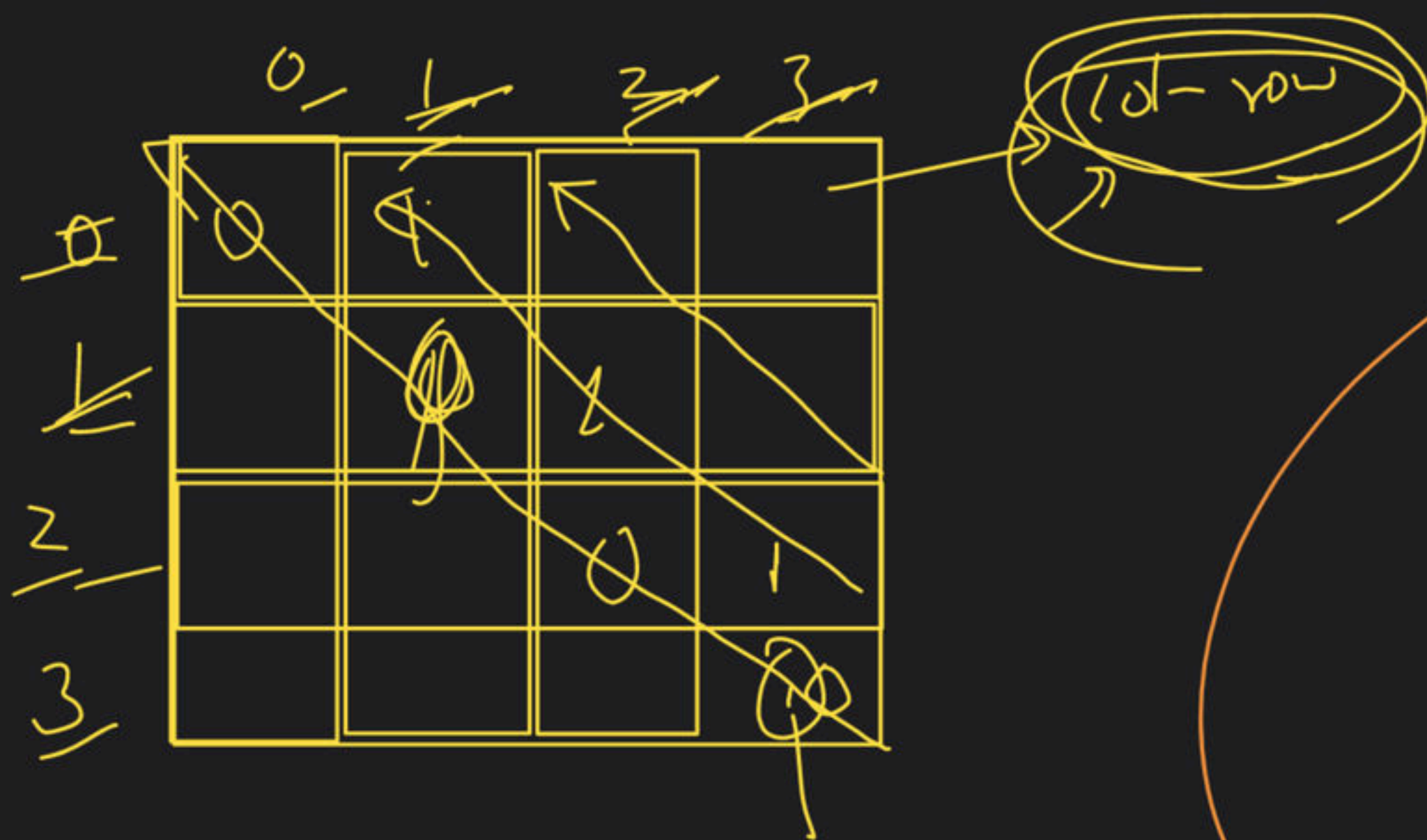
Video →

DSA Projects

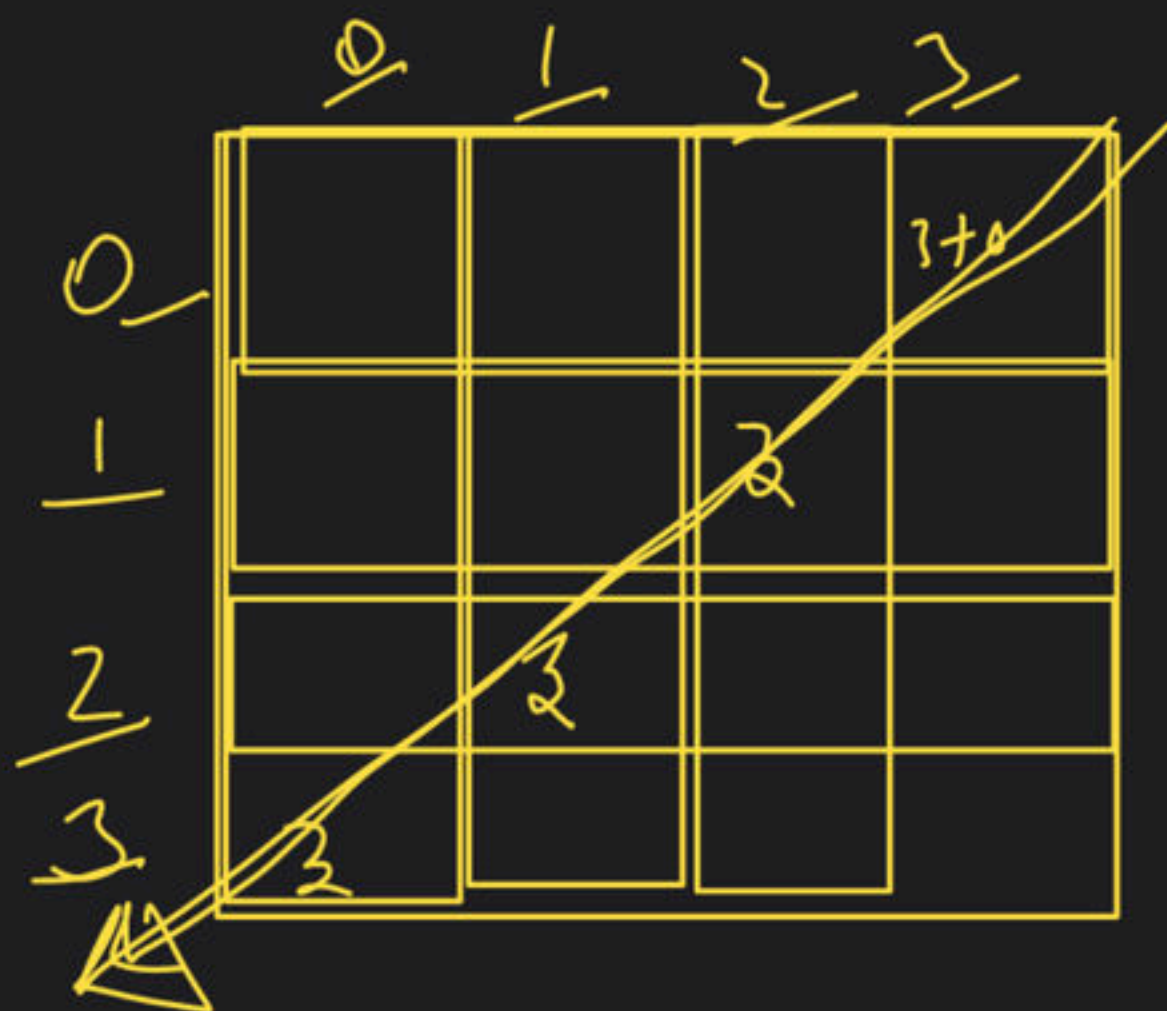
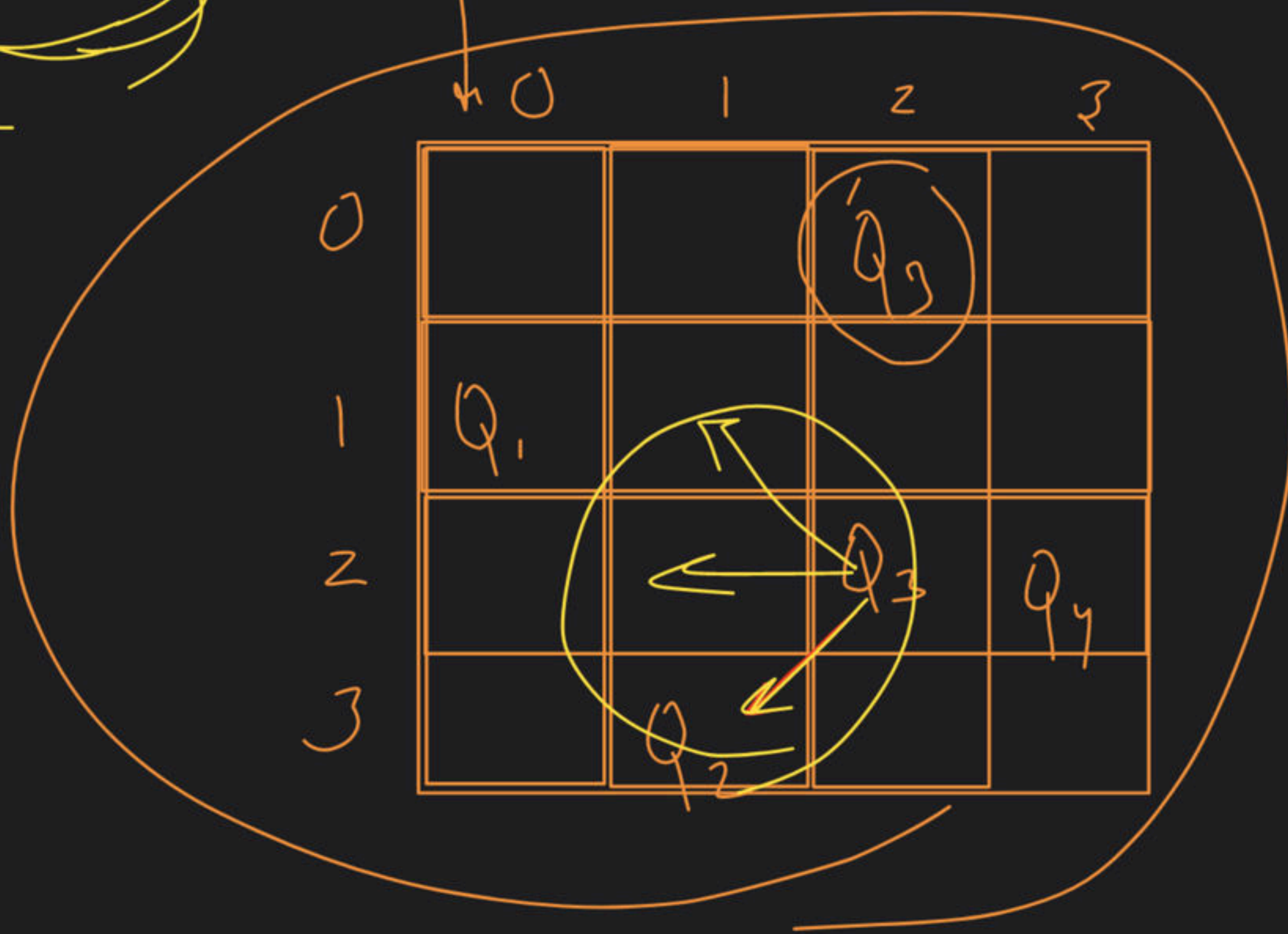
1 comment

6 x 6
12 x 12





1 col \rightarrow 1 Q



row + col

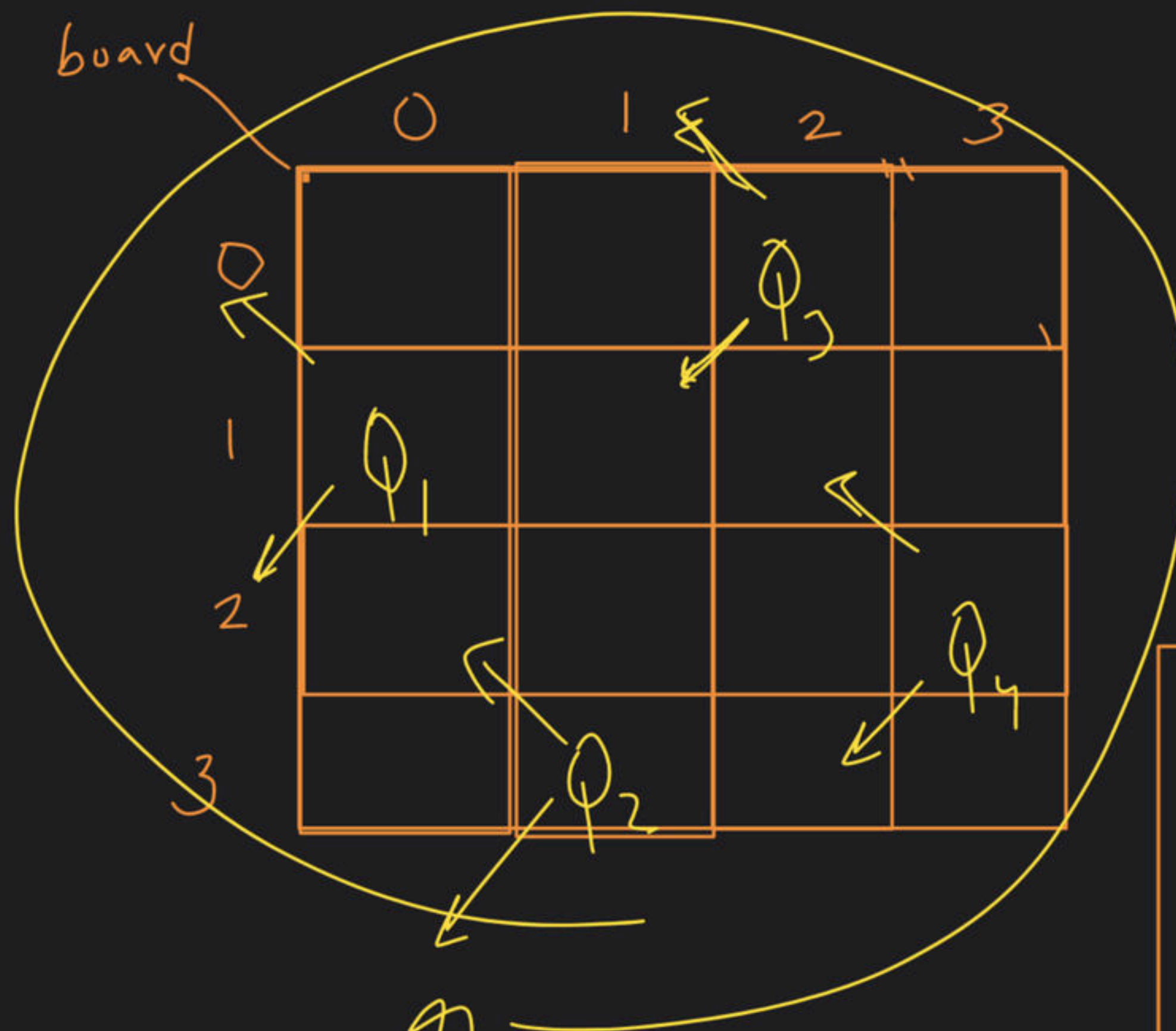
Row Check

0 → ~~X~~ T
 1 → ~~X~~ T
 2 → ~~X~~ T
 3 → ~~X~~ T

Top Diagonal

3 → F
 2 → ~~X~~ T
 1 → ~~X~~ T
 0 → F
 -1 → ~~X~~ T
 -2 → ~~X~~ T
 -3 → F

board



Bottom Diagonal

0 → F
 1 → ~~X~~ T
 2 → ~~X~~ T
 3 → F
 4 → ~~X~~ T
 5 → ~~X~~ T
 6 → F

1 solution

→ Sudoku Solver

2 min
// Back

row = 4, col = 4
 ↑ ↑
 ↑ ↑

$$3 \times \left(\frac{4+1}{3}\right) + \frac{4}{3}$$

for (i = 0 → 9)
 i = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

col = 4

$$\left(\frac{4}{3}\right) = 1 \times 3 = 3$$

0, 1, 2, 3, 4, 5, 6, 7, 8, 9

	0	1	2	3	4	5	6	7	8
0	5	3							
1	6			1	9	5			
2		9	8					6	
3	8								3
4									
5	7								6
6		6					2	8	
7				4		9			5
8								7	9

3+0, 3+1, 3+2
 (3,3), (3,4), (3,5)
 (4,3), (4,4), (4,5)
 (5,3), (5,4), (5,5)

(+0), (+1), (+2)
 (+0), (+1), (+2)
 (+1), (+2)

(%3)

3, 4, 5, 6, 7, 8, 9

The Last Class

→ Kal



row \rightarrow

$$3 \times \left(\frac{1}{3} \right) + i/3$$

col \rightarrow

$$3 \times \left(\frac{c}{3} \right) + i \cdot 0/0$$



6/7

