



Doubts Class - [Join here]

Special class

Limited Time

Intuit

① String → Revenue w/o STL
→ 20 =

Tonin

Edit distance
Gom

② DP → 2D → 50 =

③ Graph → 50 =

Kahani
Dijkstra
We



Dynamic Programming Class-5

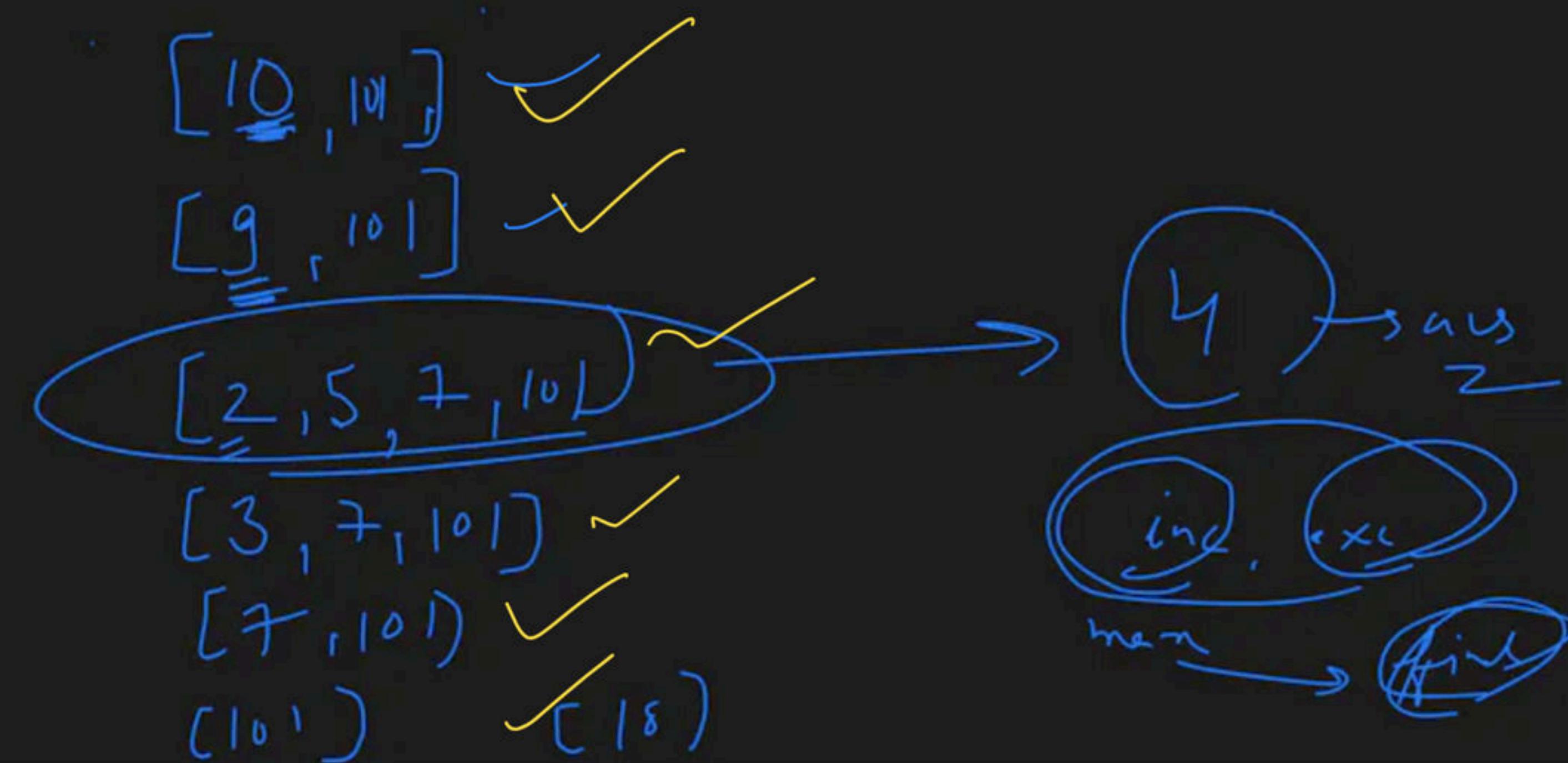
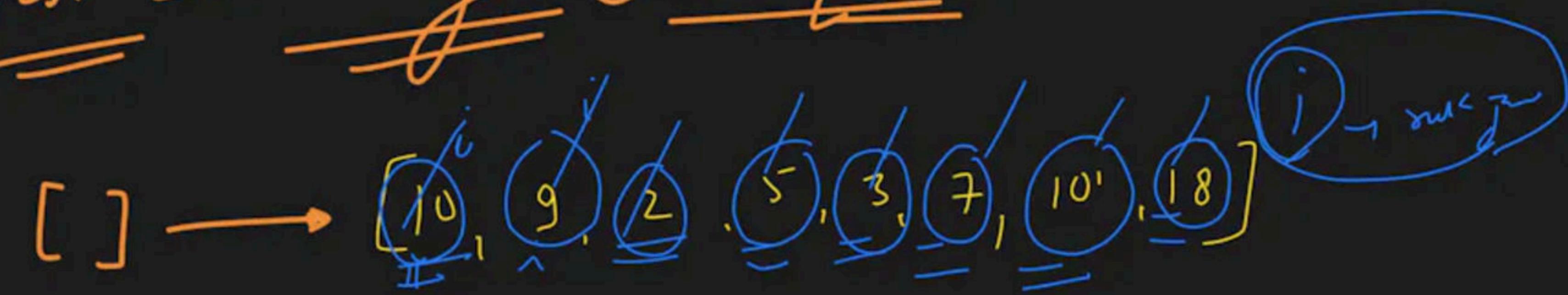
Special class

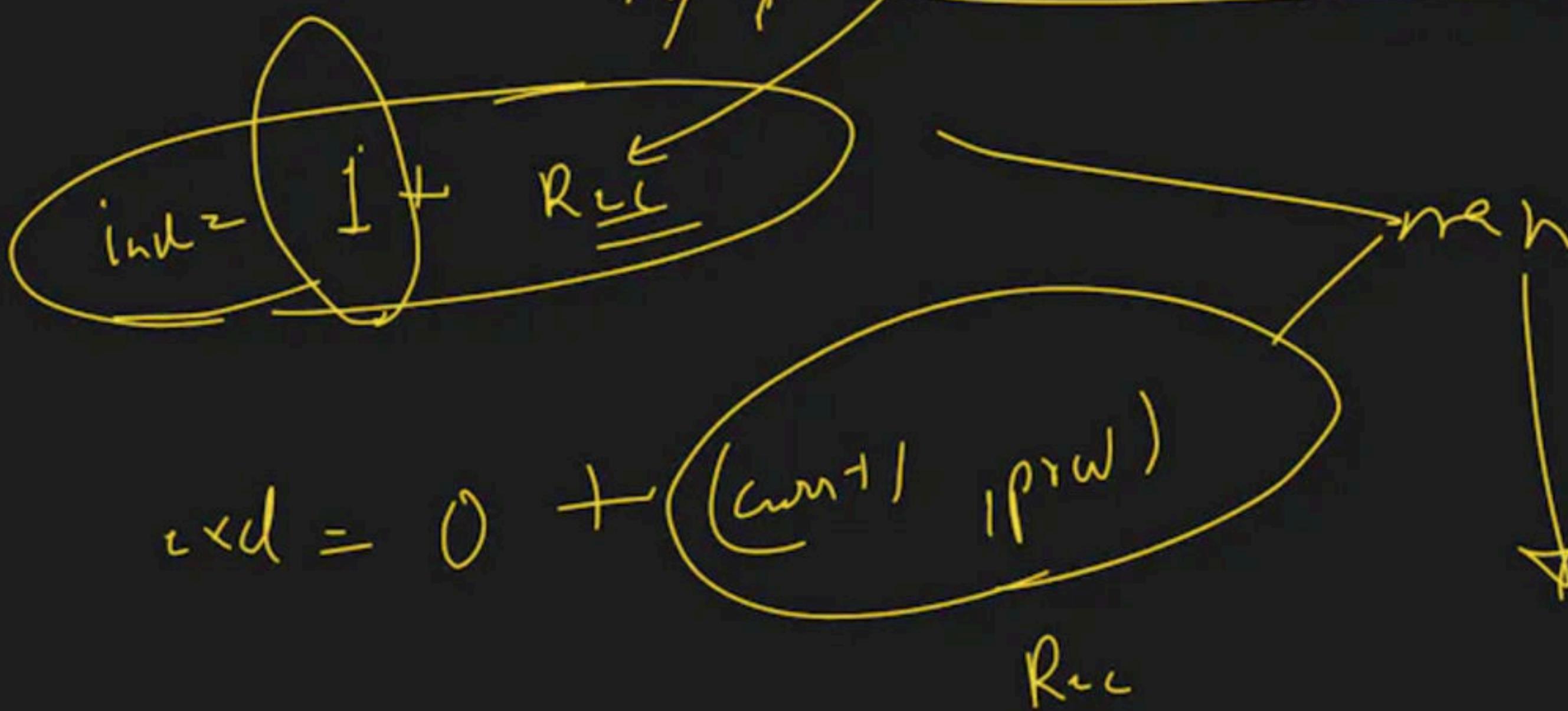
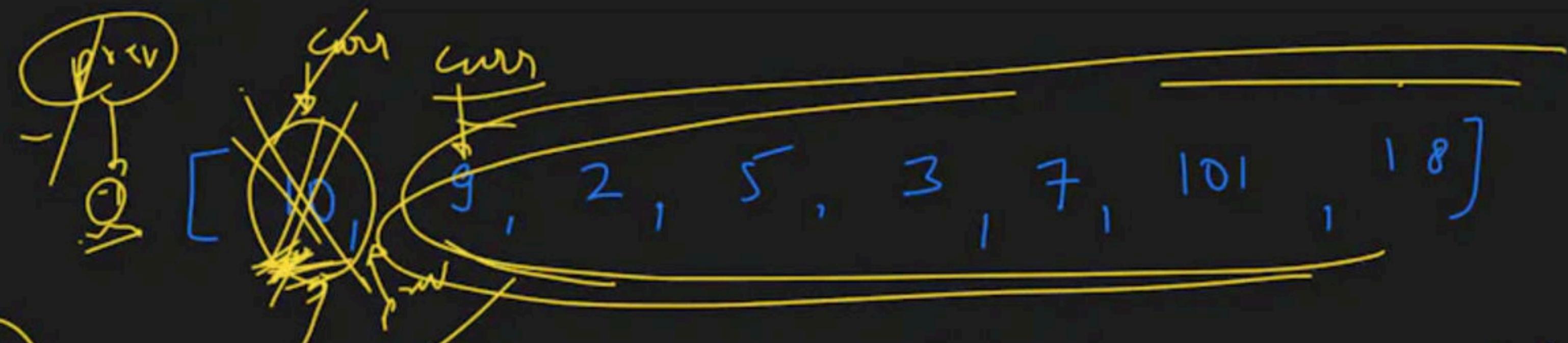
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Space
Optimisation

aaј
End of class

→ Longest Increasing Subsequence





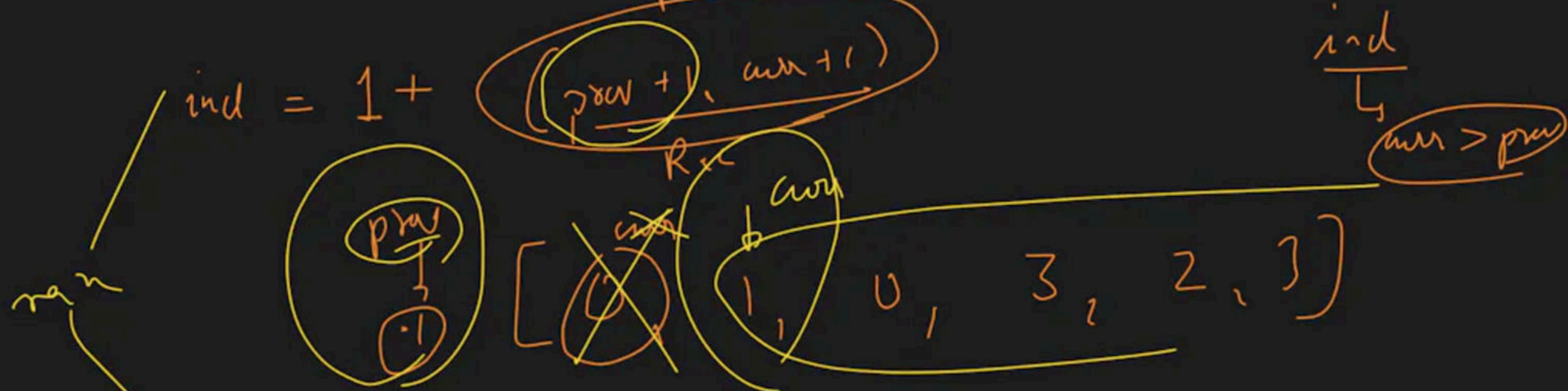
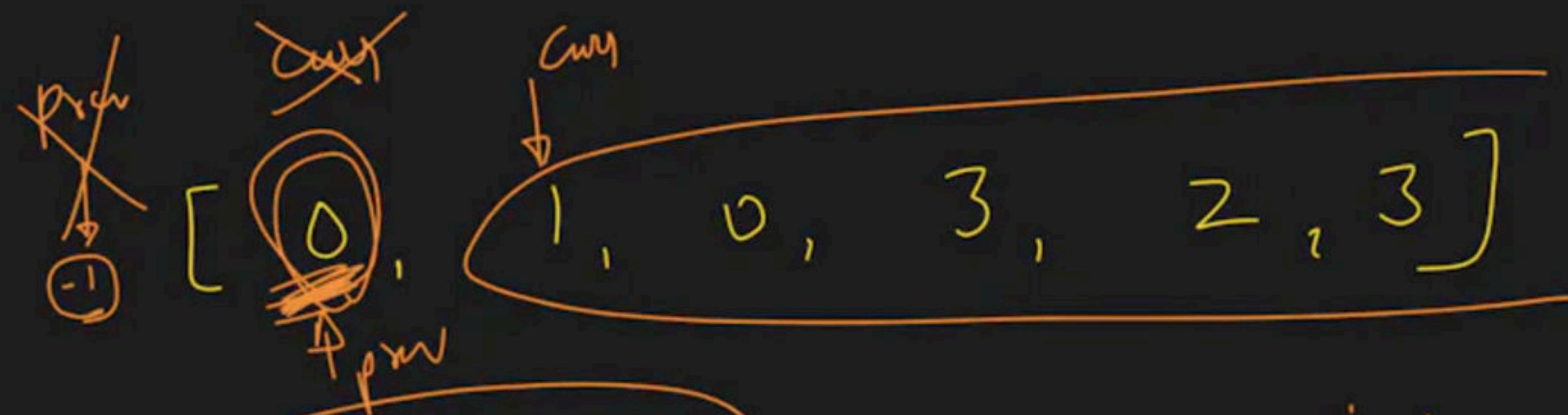
$$val = 0 + (curr \cdot 10^{\text{pos}})$$

R_{rec}

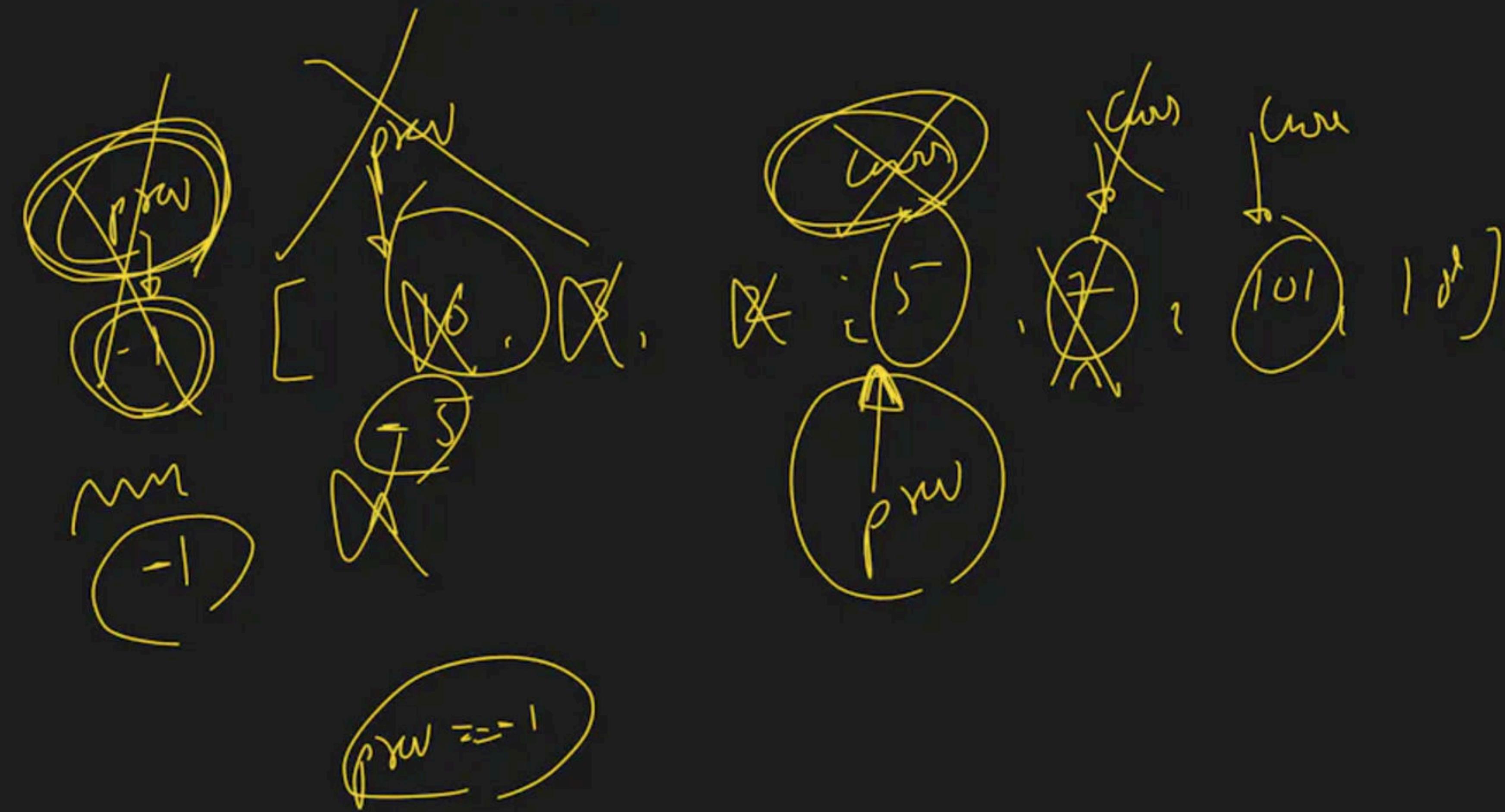
first

include
↳ curr > prev

exclude
=



$$\text{exd} = 0 + \frac{\text{curr} + 1, \text{prev}}{R_{\text{cc}}}$$



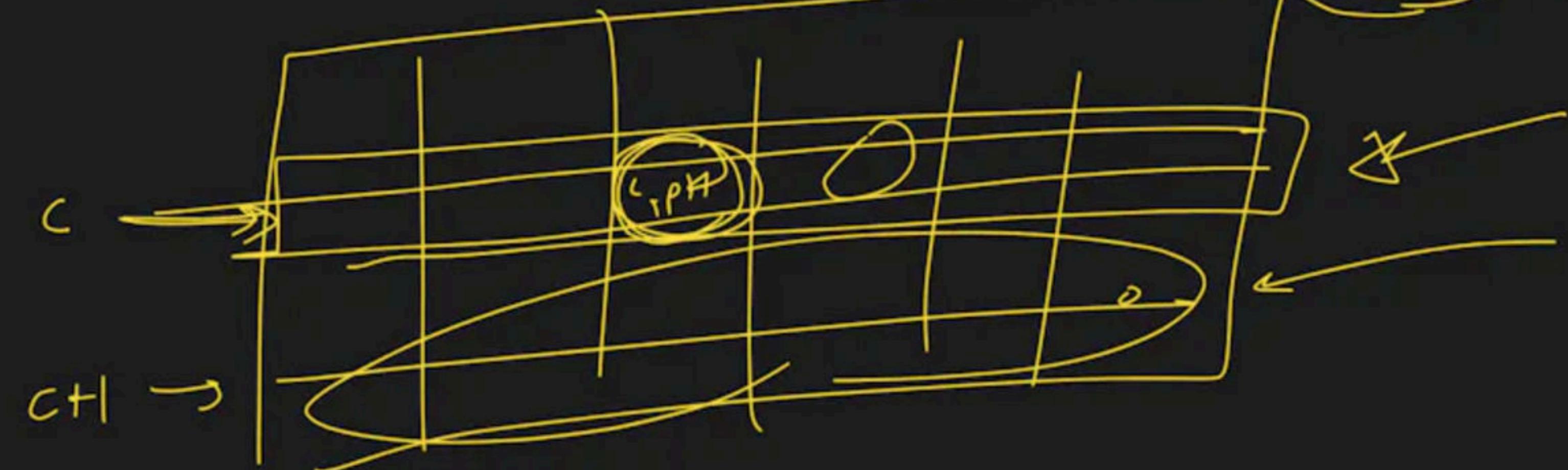
SO

=

$$dr [c] (p+1)$$

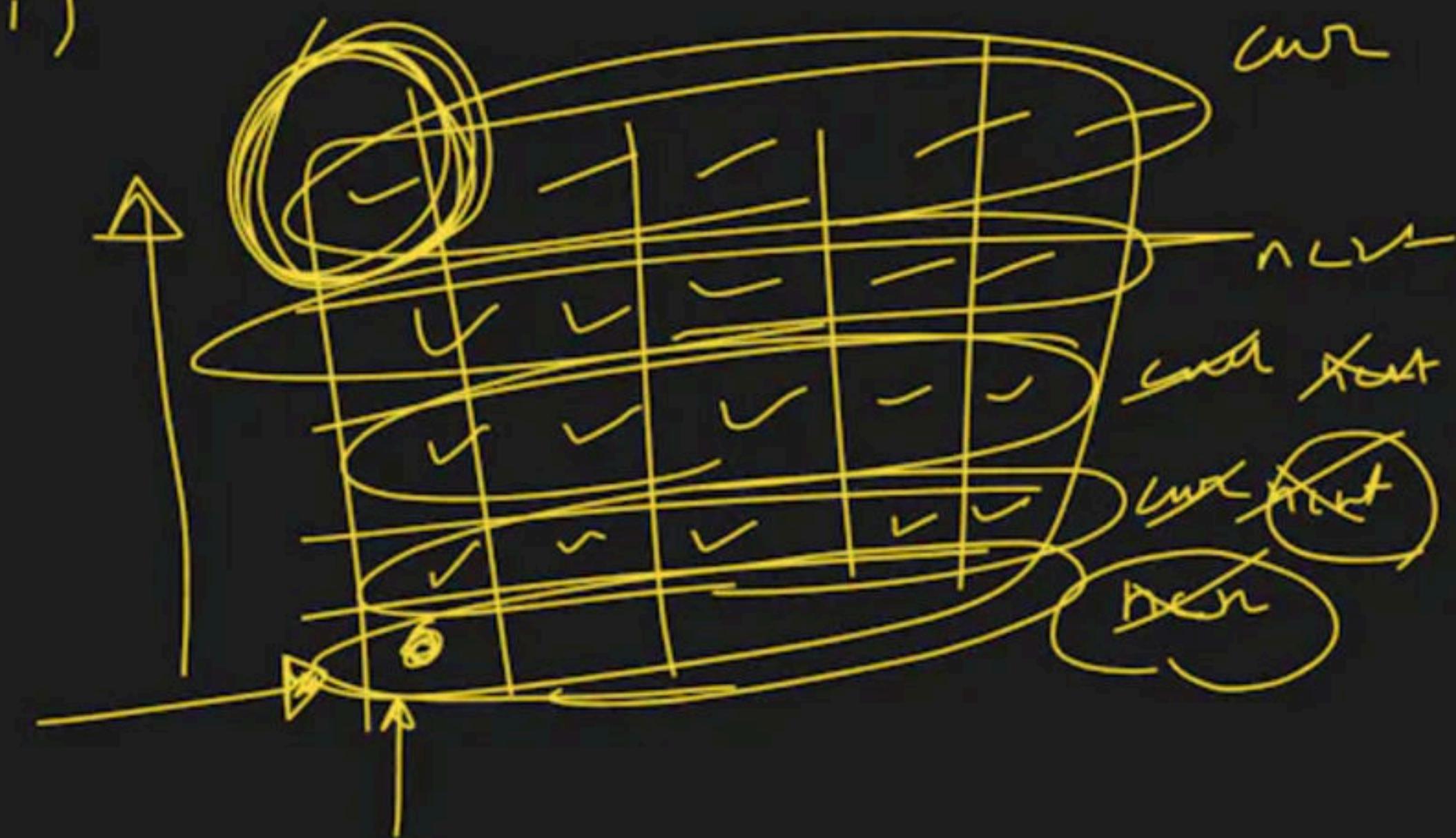
$$dp [c+1] \underline{[c+1]}$$

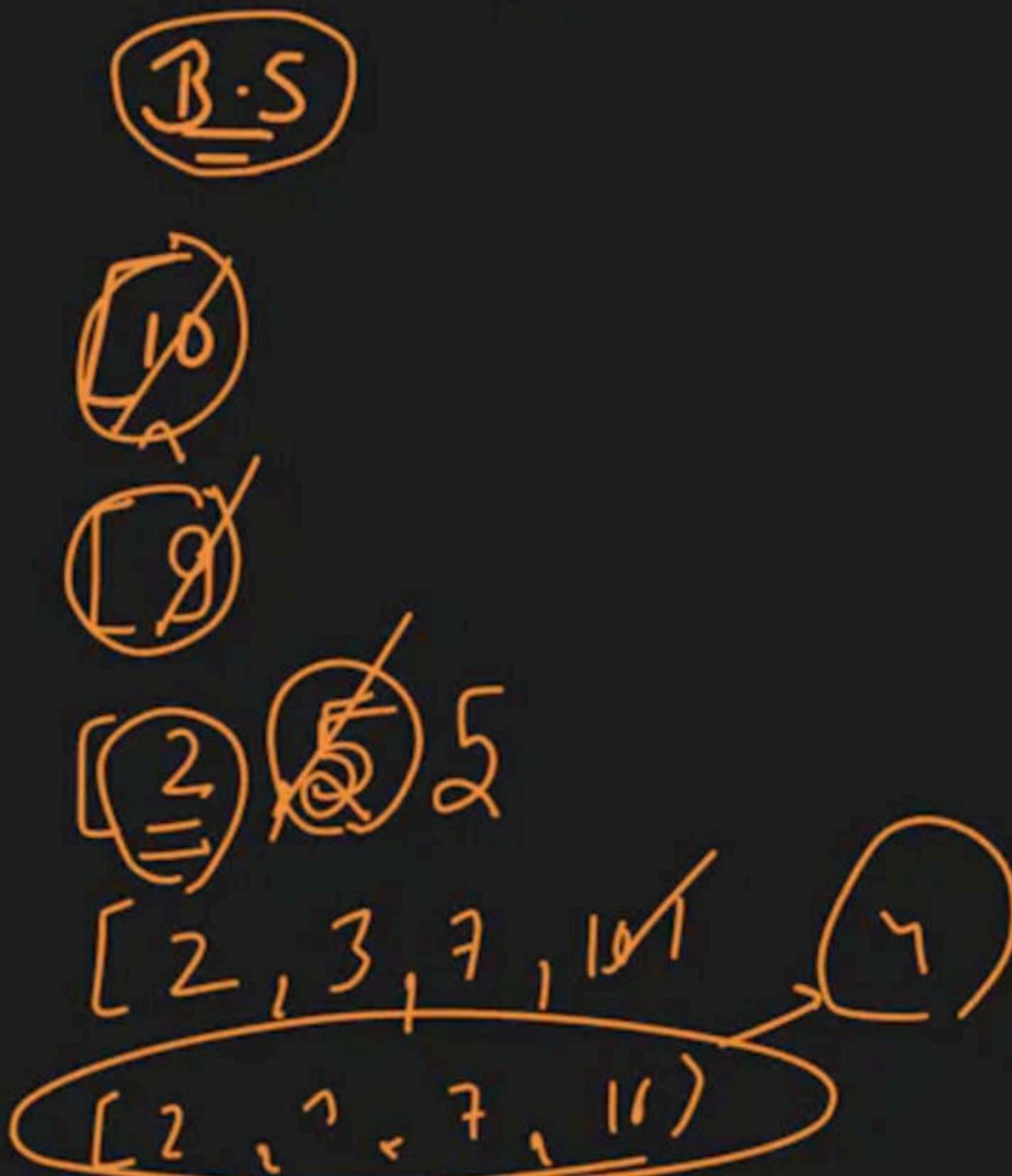
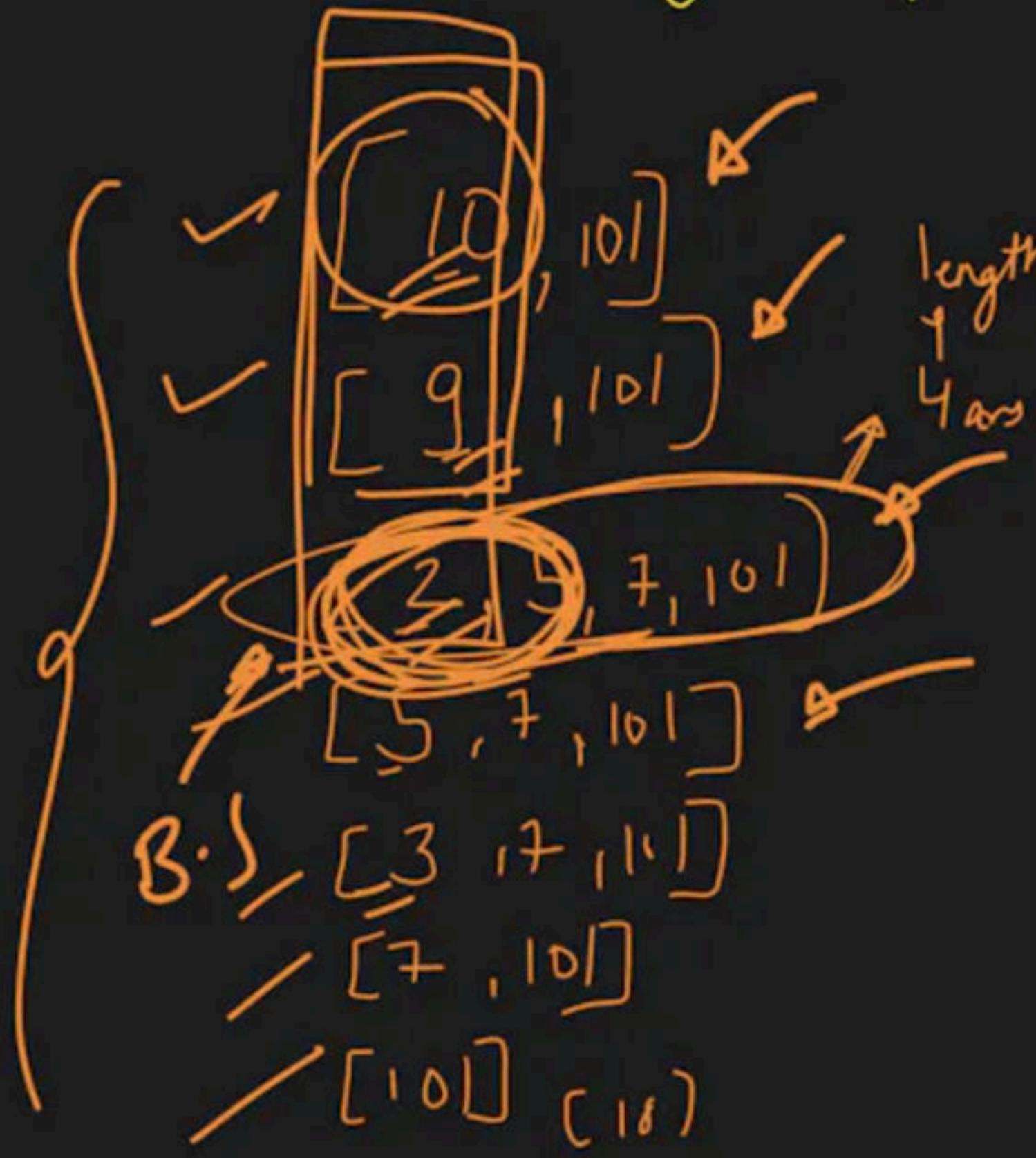
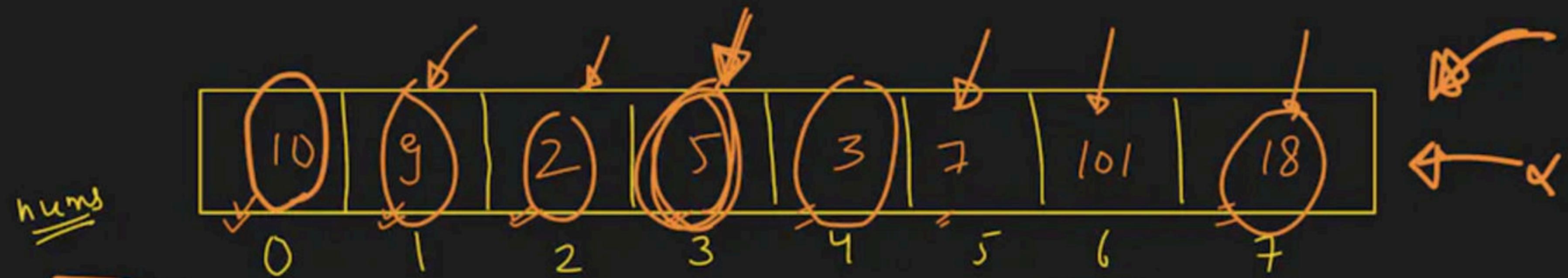
$$\sqrt{r} [c+1] [p+1]$$

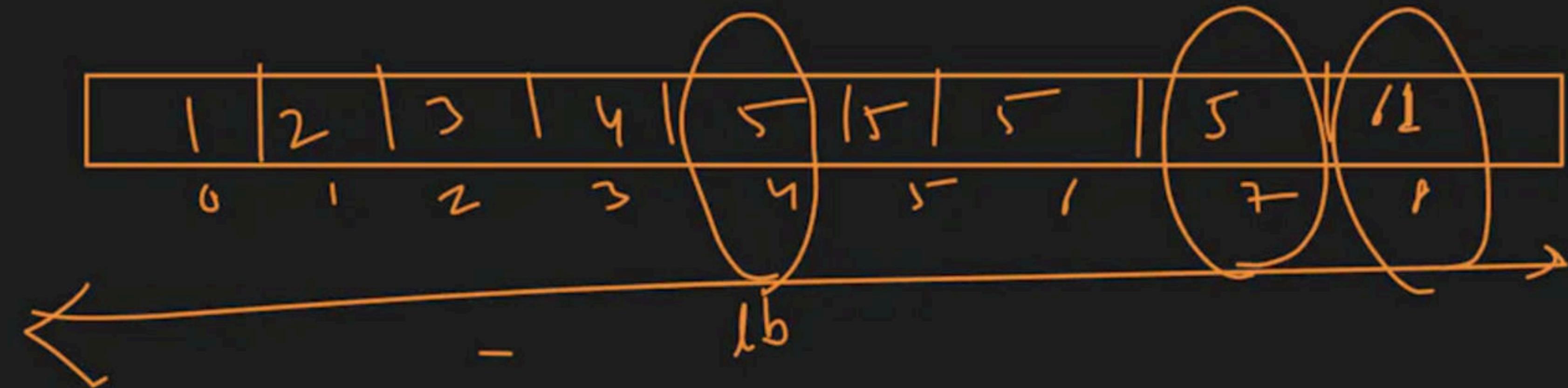


for (n - 1 → 0)

(cur - 1 → . . .)

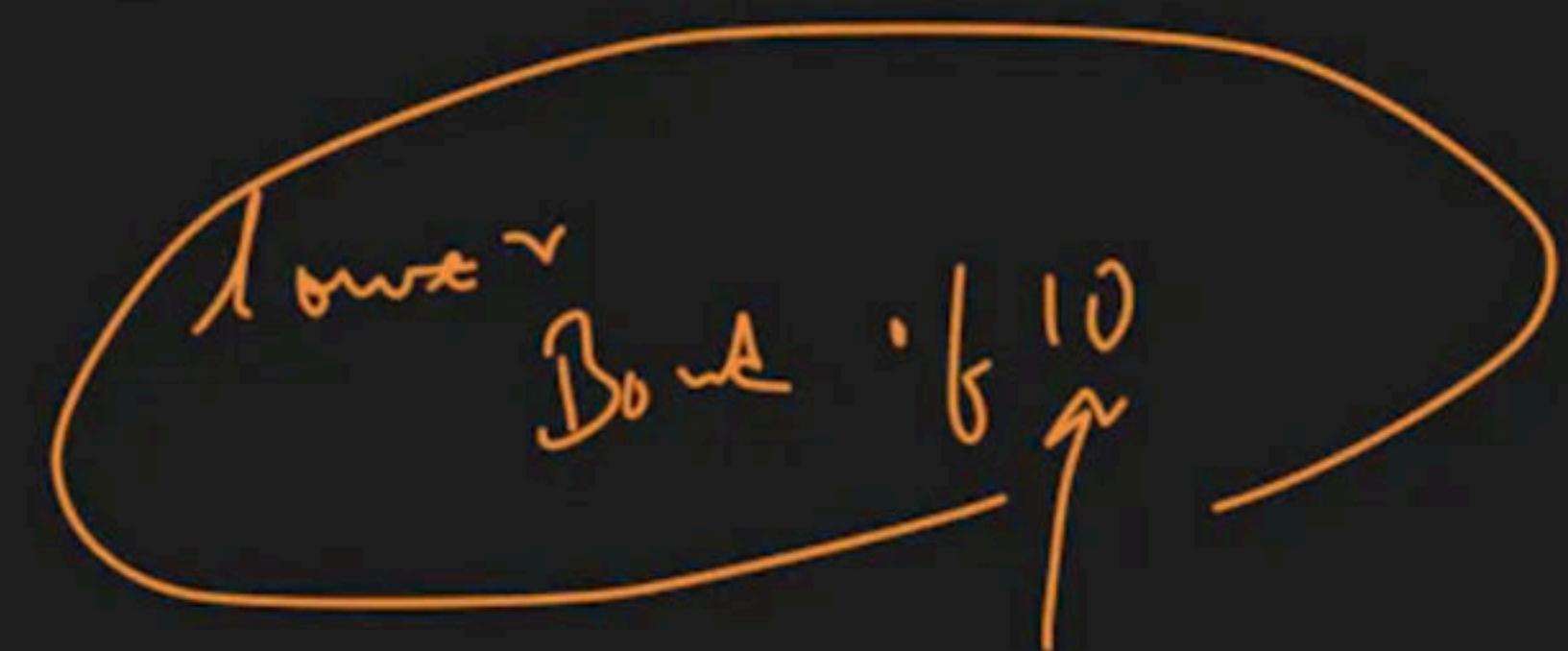




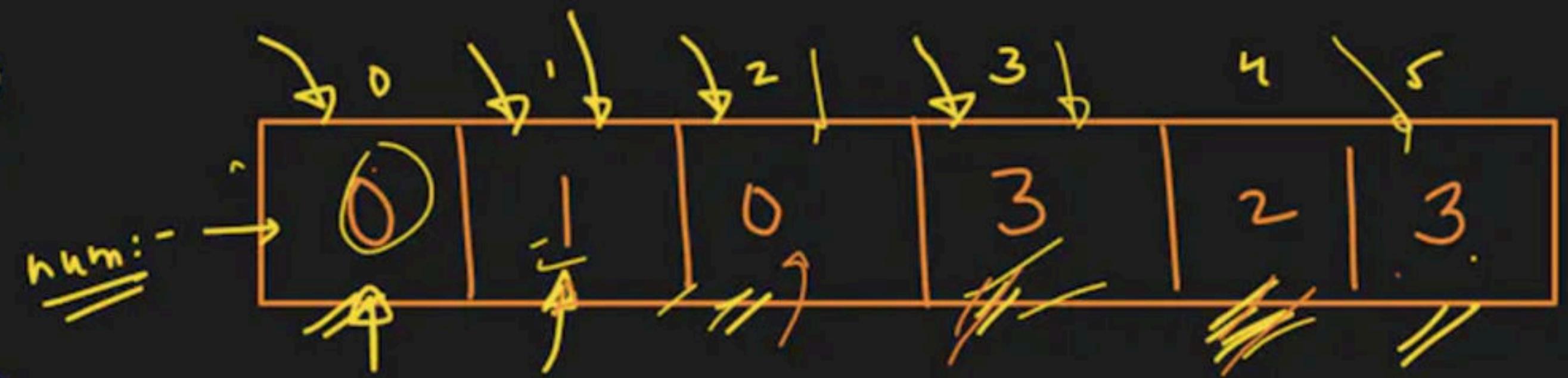


lower bone

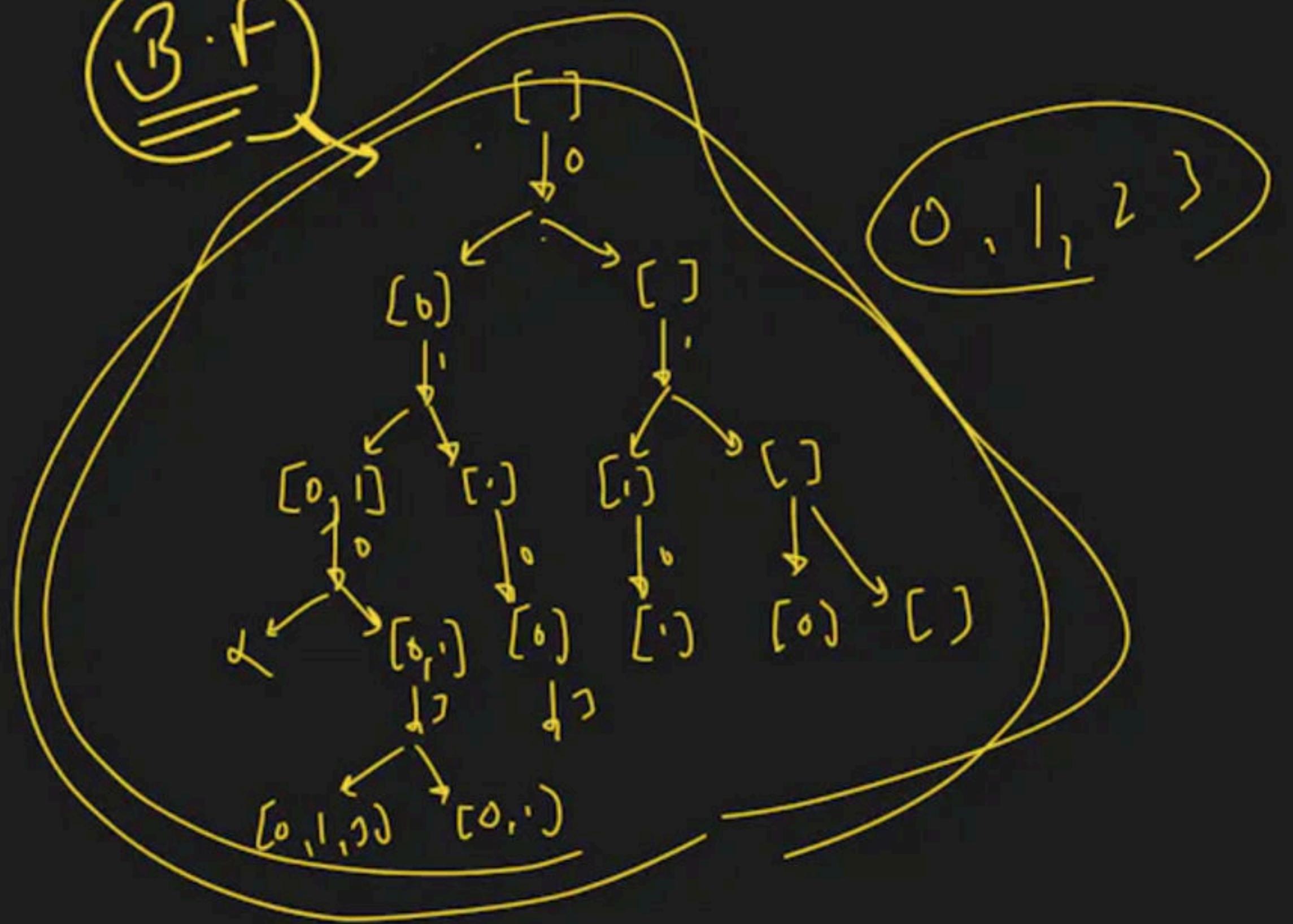
upper bone



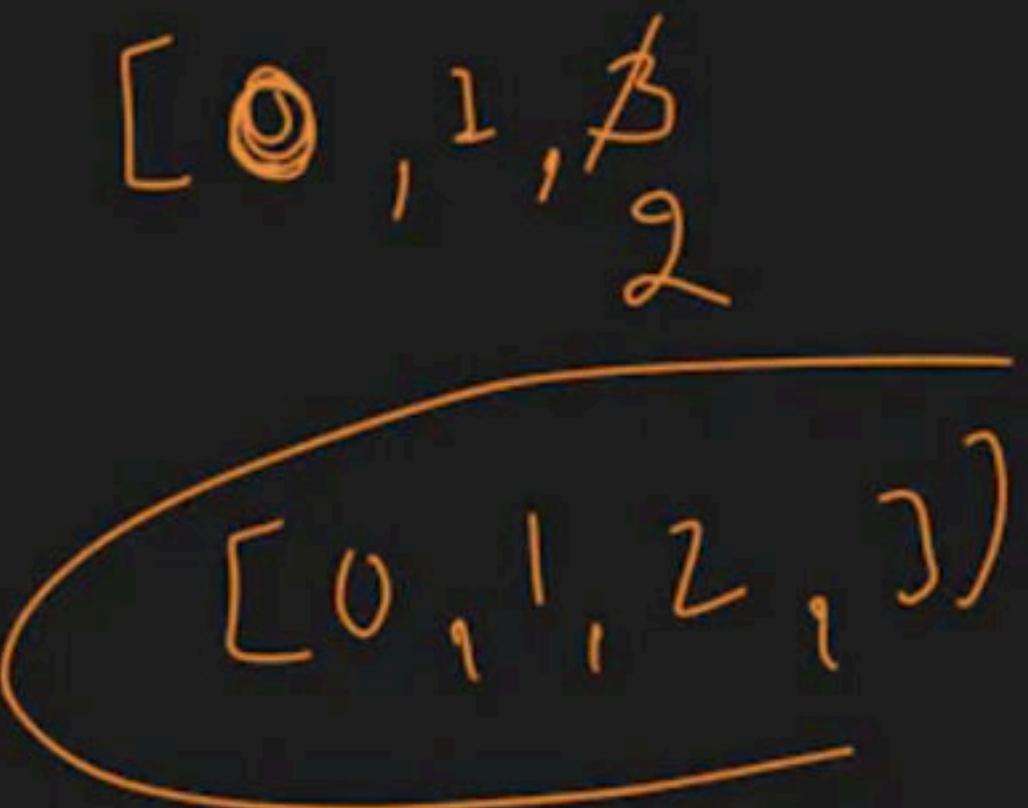
06



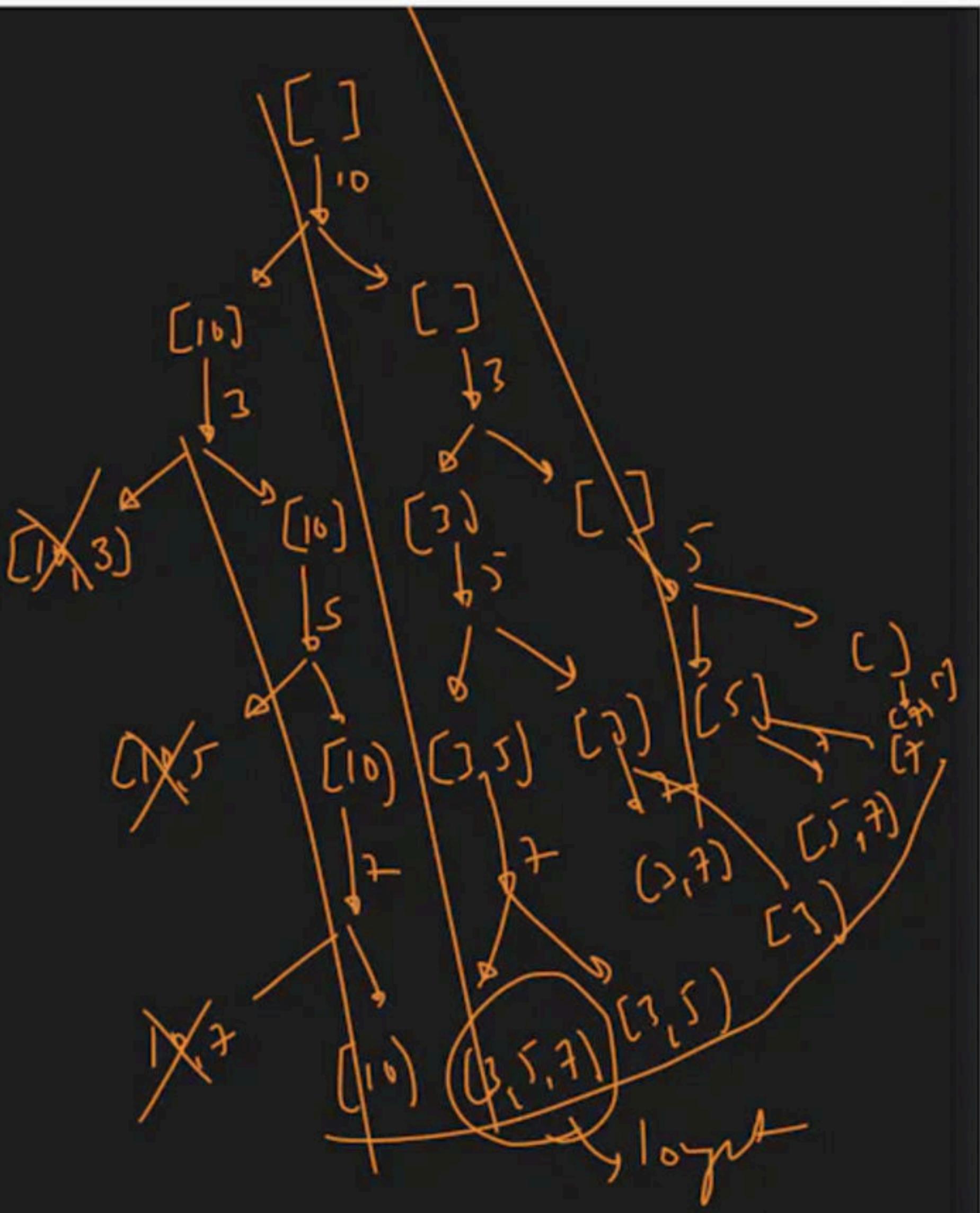
B·F

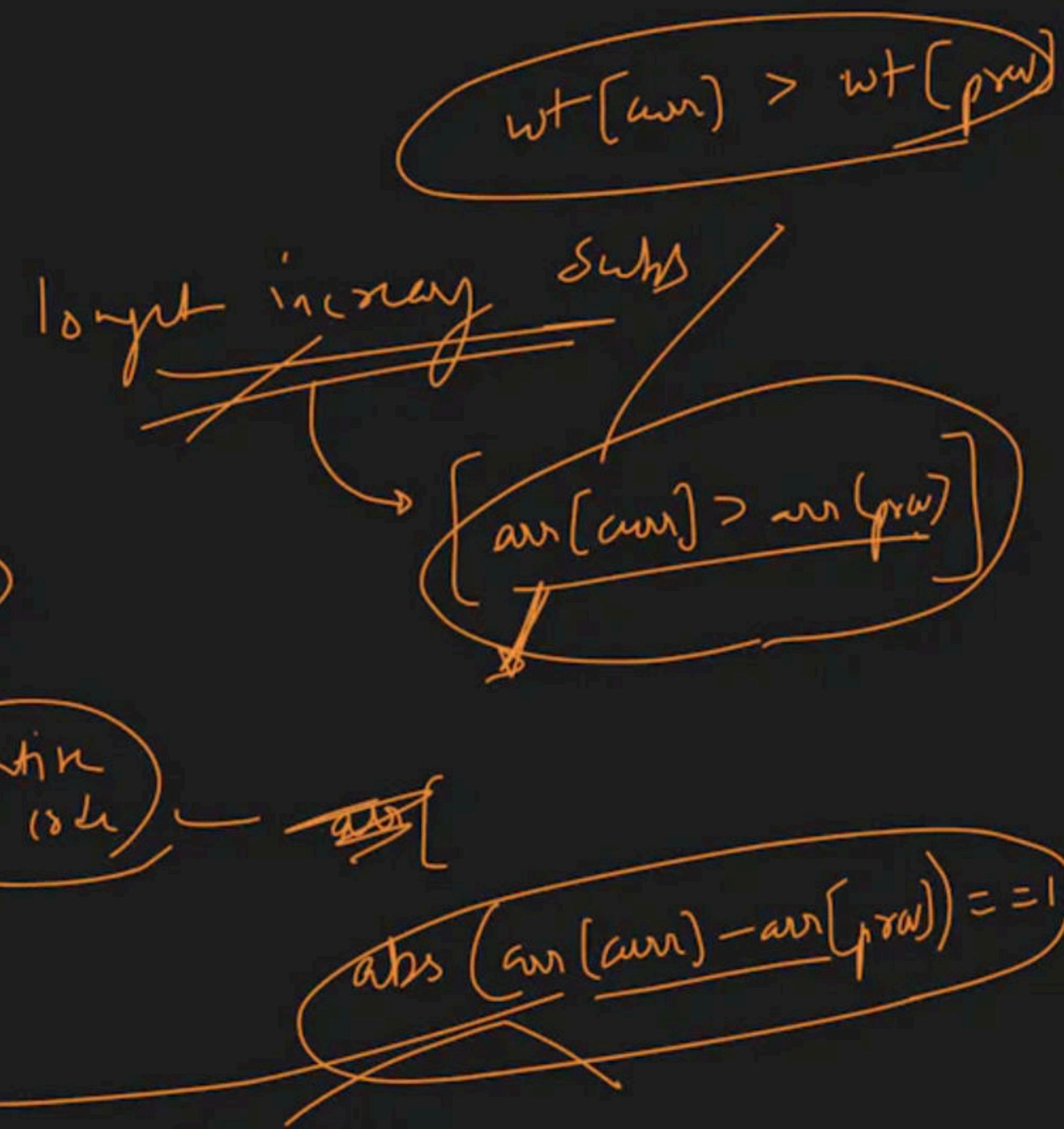
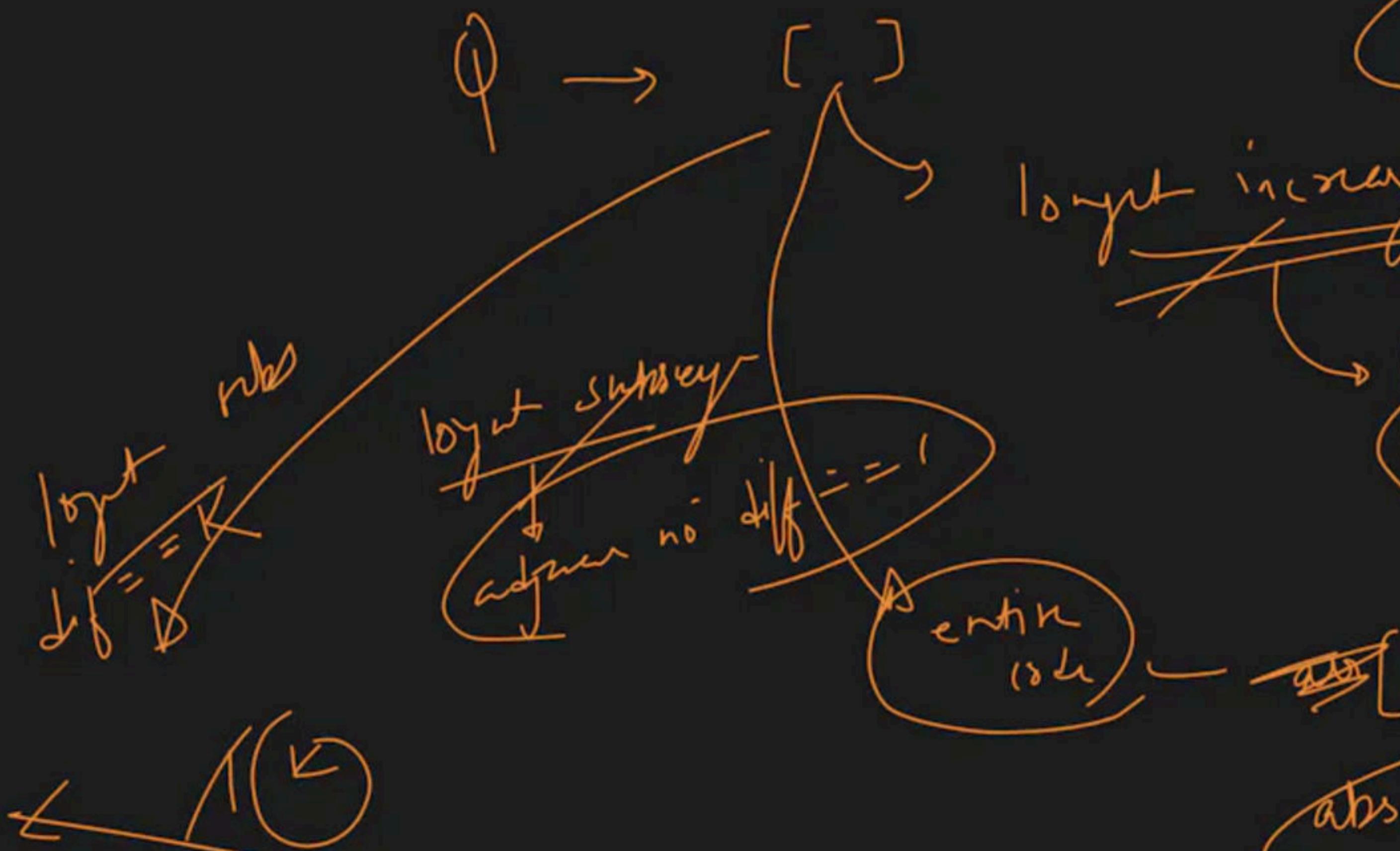


B·S:-



10	3	5	7
----	---	---	---

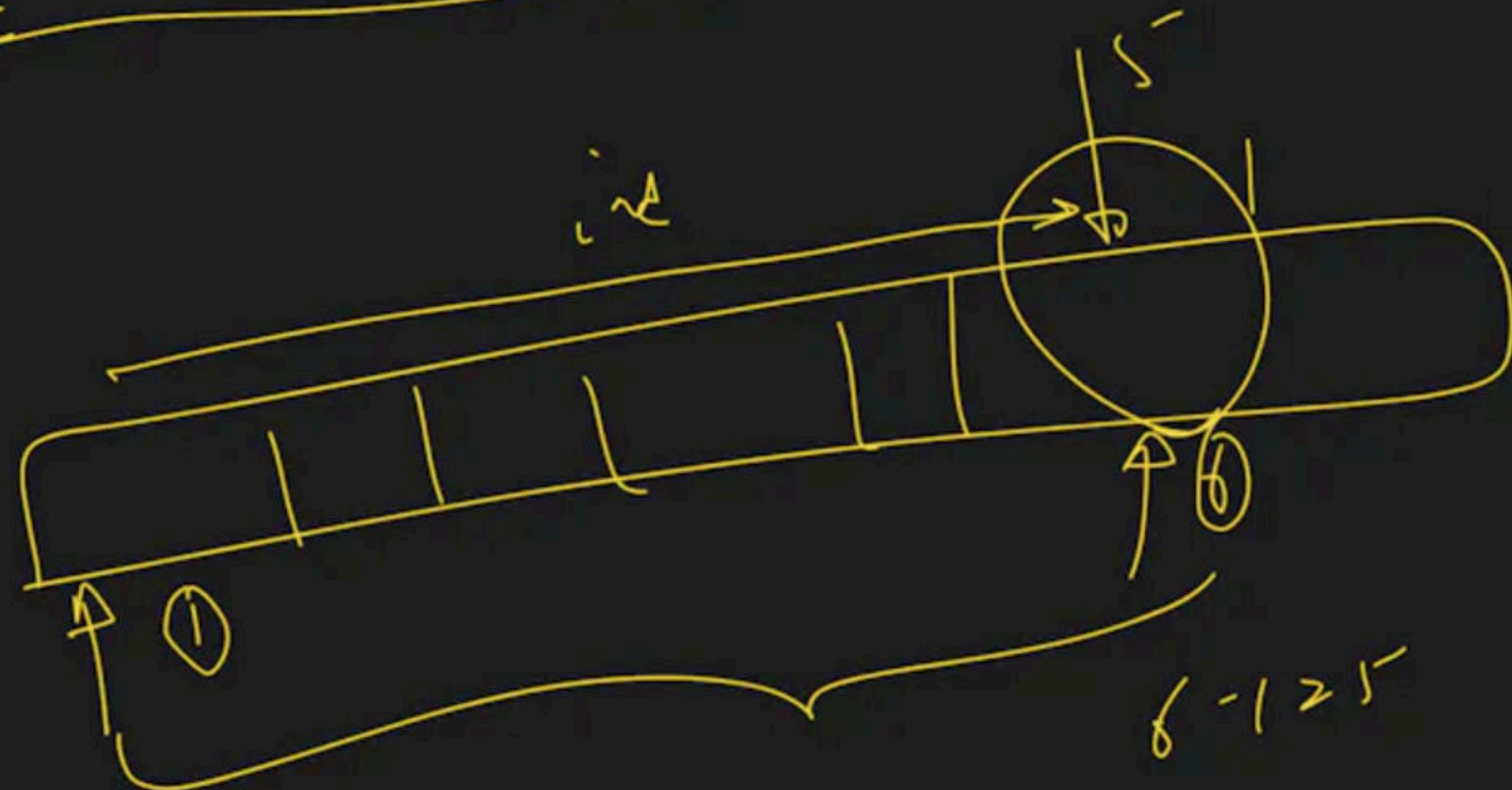


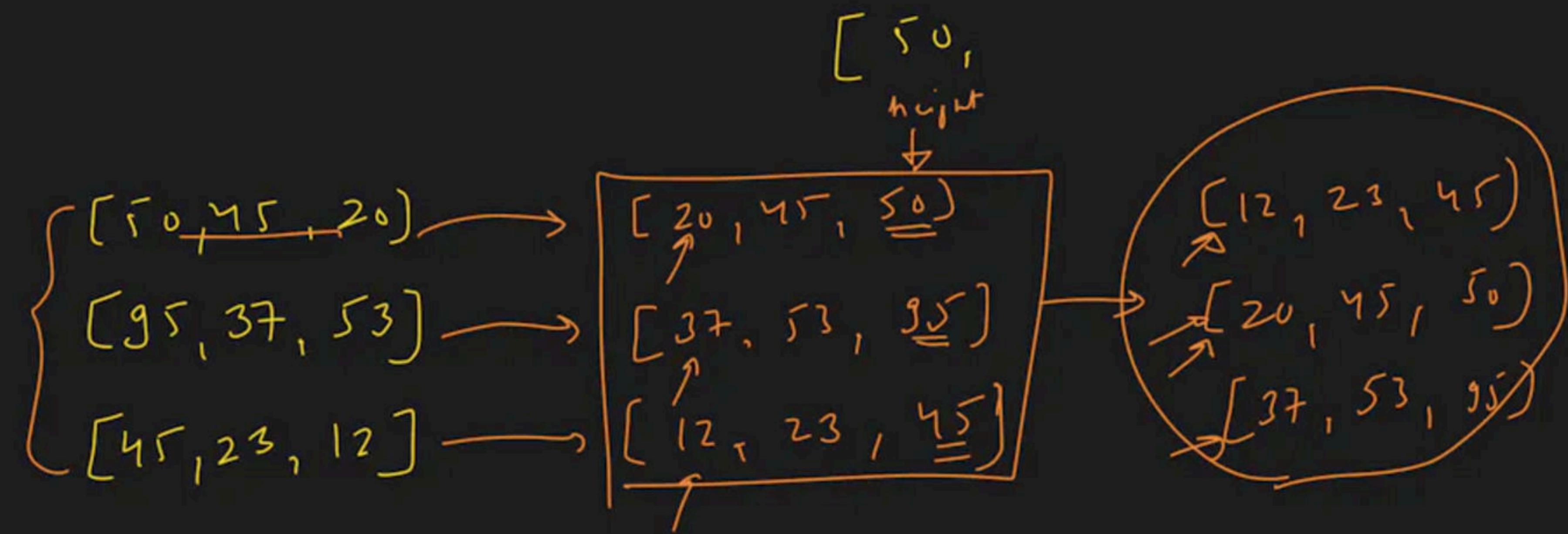




mrw

lower_bound (ans.begin(), ans.end(), num[i])
ans.begin();





$$dp[i][j][j] \rightarrow dp[i+1][j+1]$$

$$dp[i+1][j]$$

$$dp[i][j+1]$$

$b[i]$

$height = cur$

0	1	2	3	4	5

cur

$newCur$

$height$

$dp[i][j][j]$

$dp[i][j+1]$

$dp[i+1][j]$

$dp[i+1][j+1]$

$a[i]$

2 | 8 | 9 | 5 | 6 | 7 | 0 | 10
 0 1 2 3 4 5 6 7
 ↑ ↑ ↑ ↑ ↑ ↑ ↑ ↑

$\Rightarrow [2, 8, 9, 10]$
 $[2, 5, 6, 7, 10]$

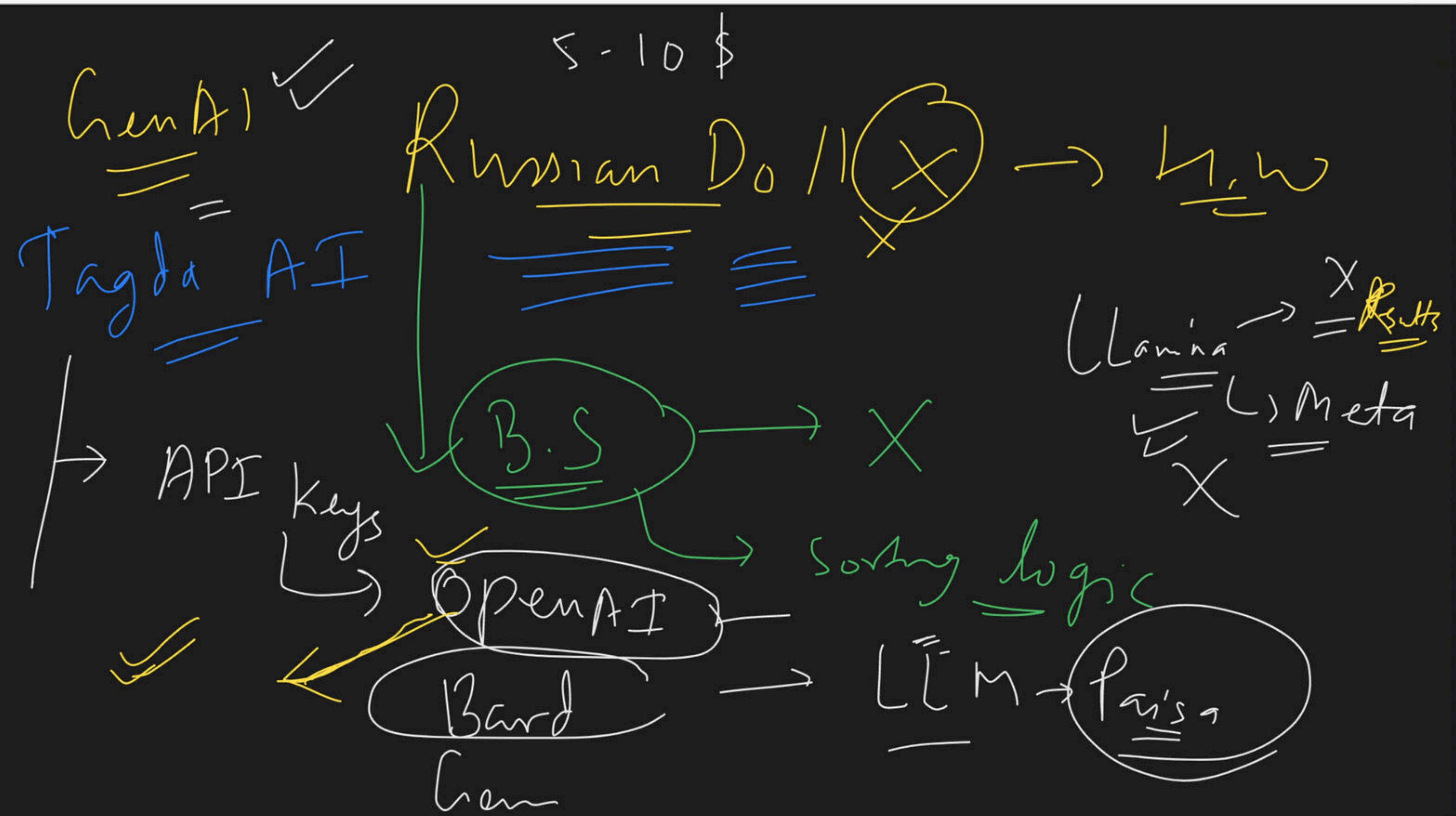
$[0, 10]$

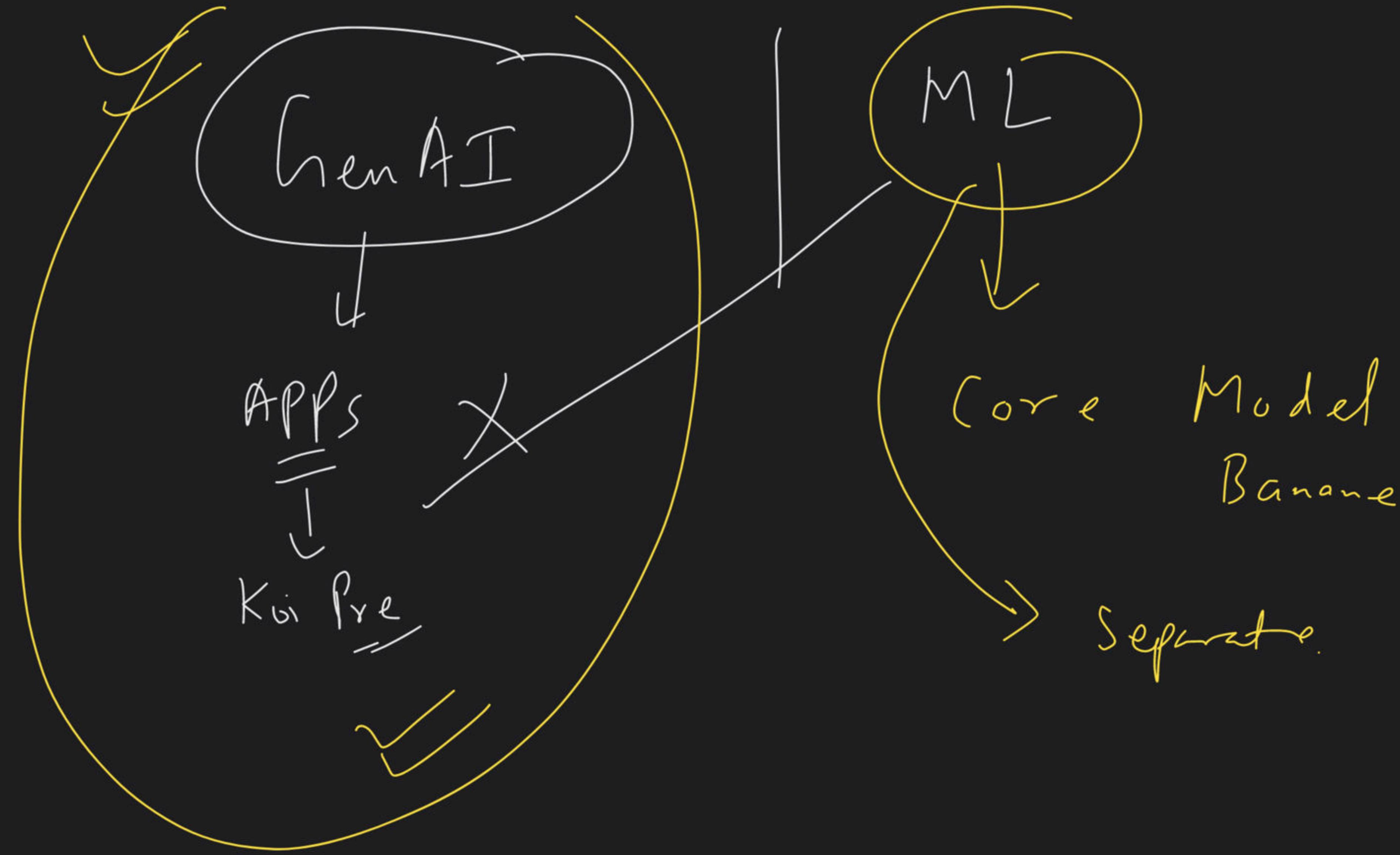
$[0, 5, 6]$
~~2, 8, 9, 7, 10~~
 ↓

if (~~ans.back()~~)
 {

}

}







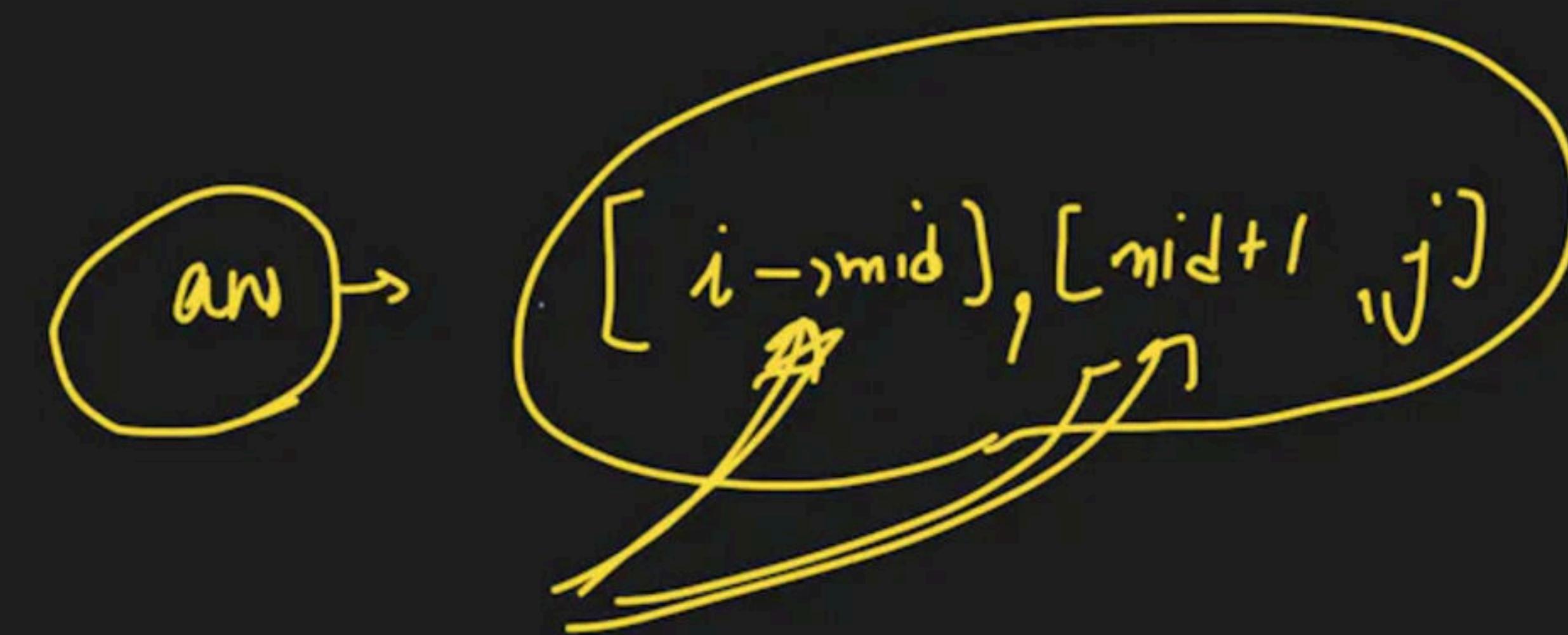
Dynamic Programming Class-6

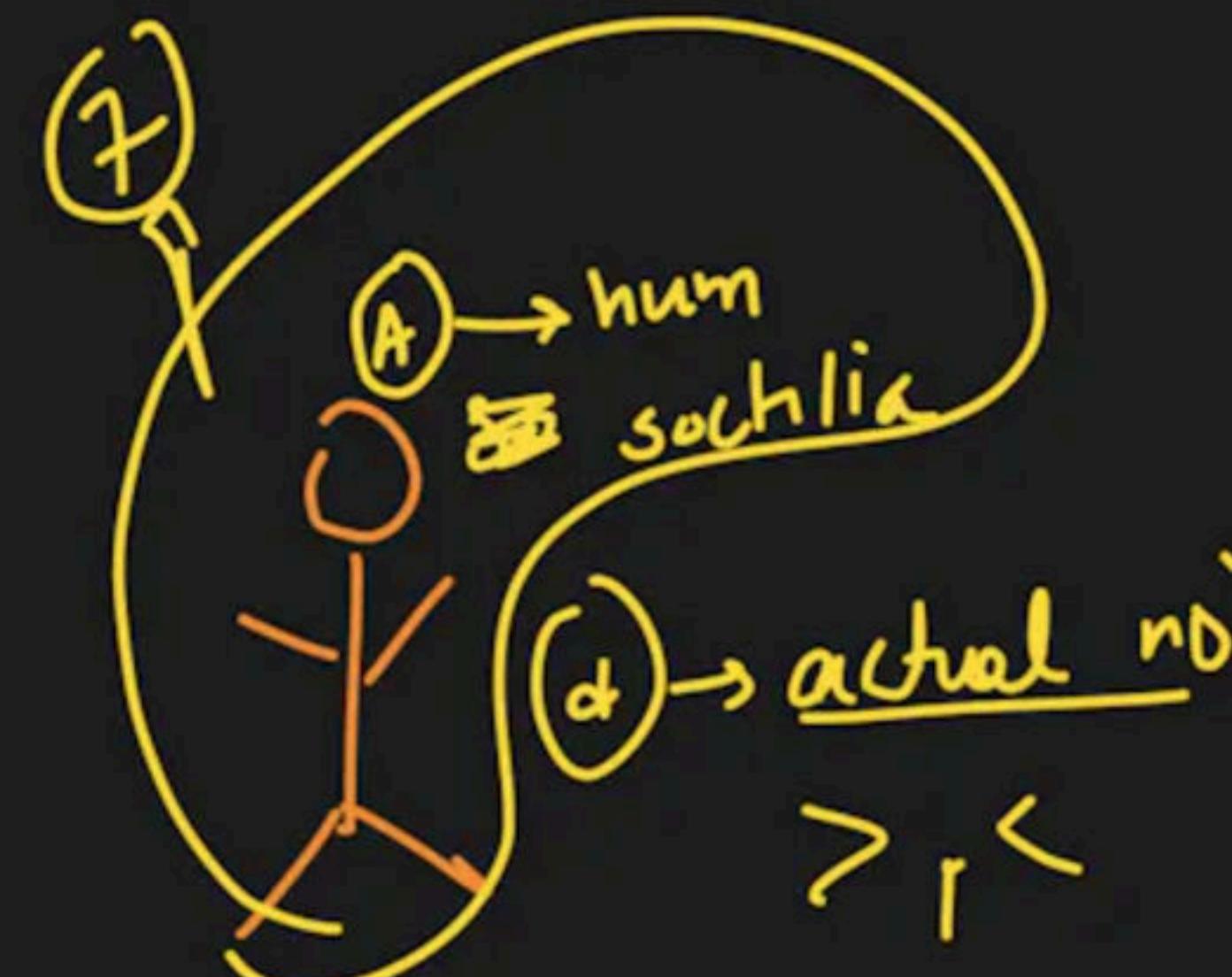
Special class

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→ Merge Interval

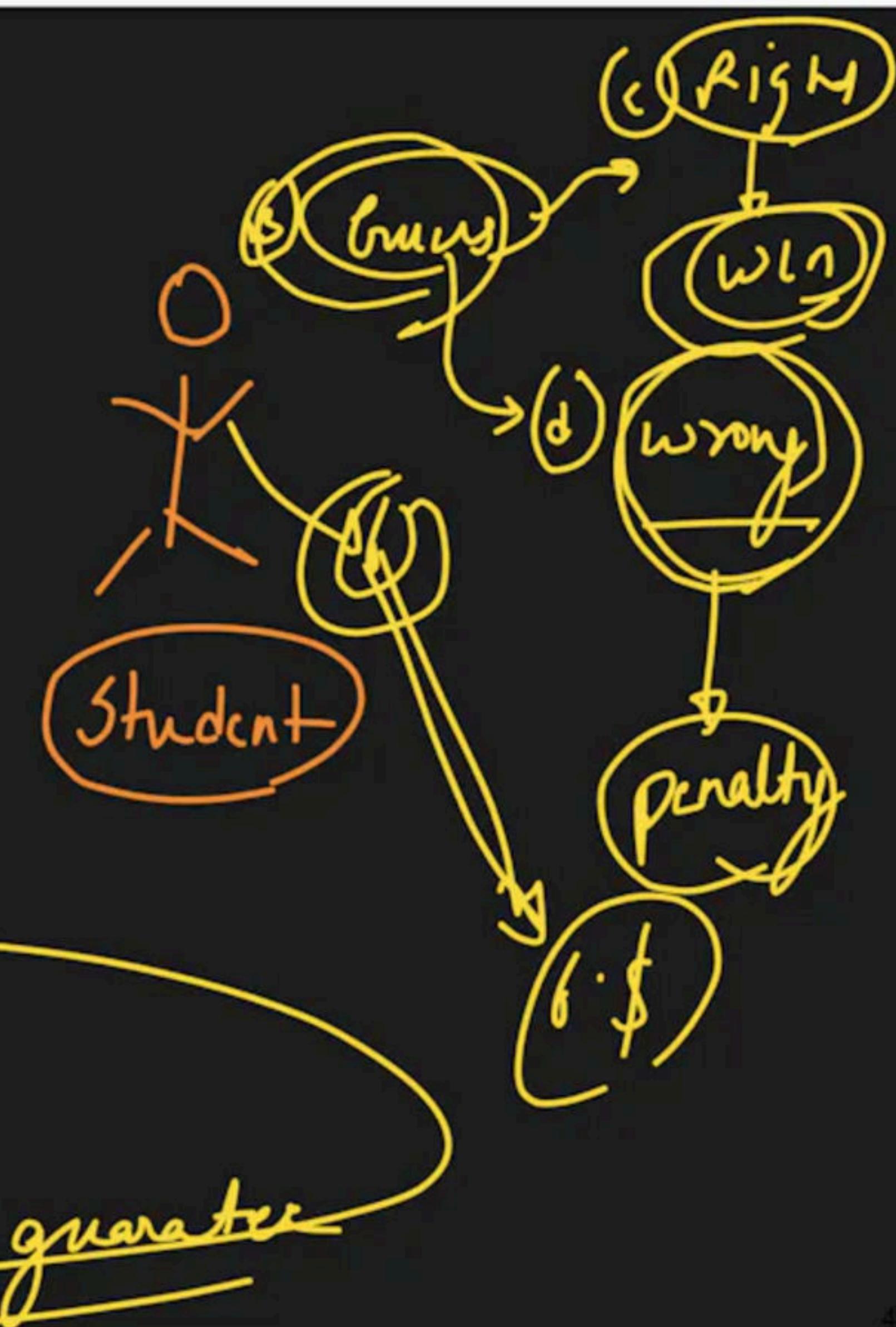
$i \rightarrow j$



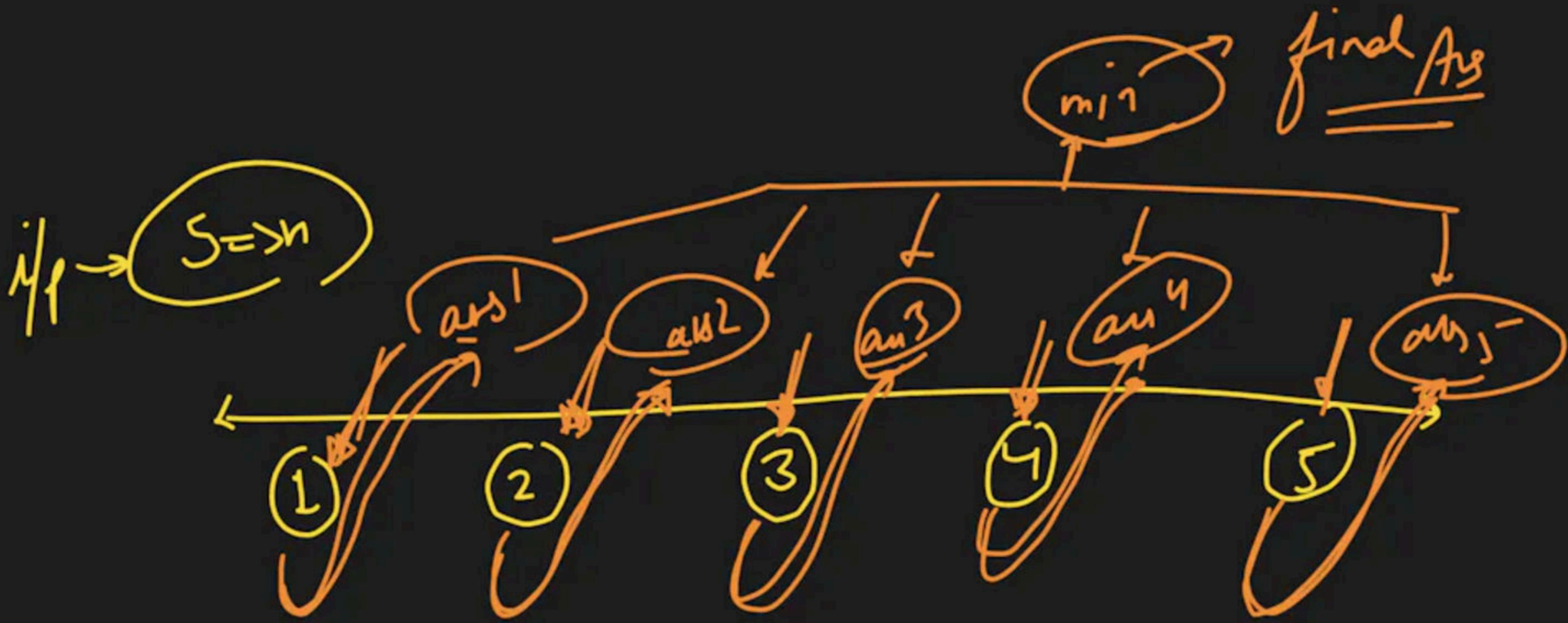


LB

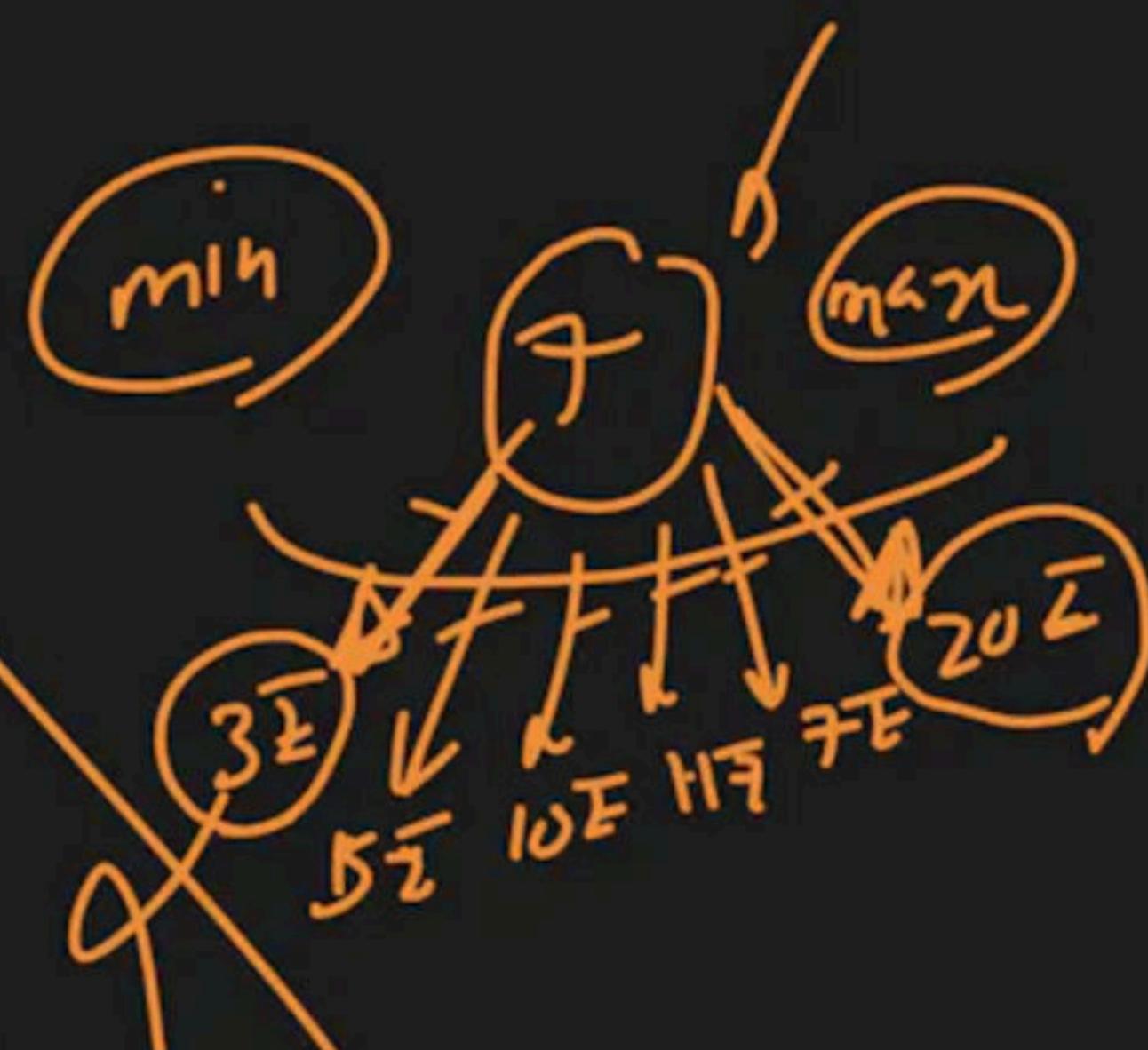
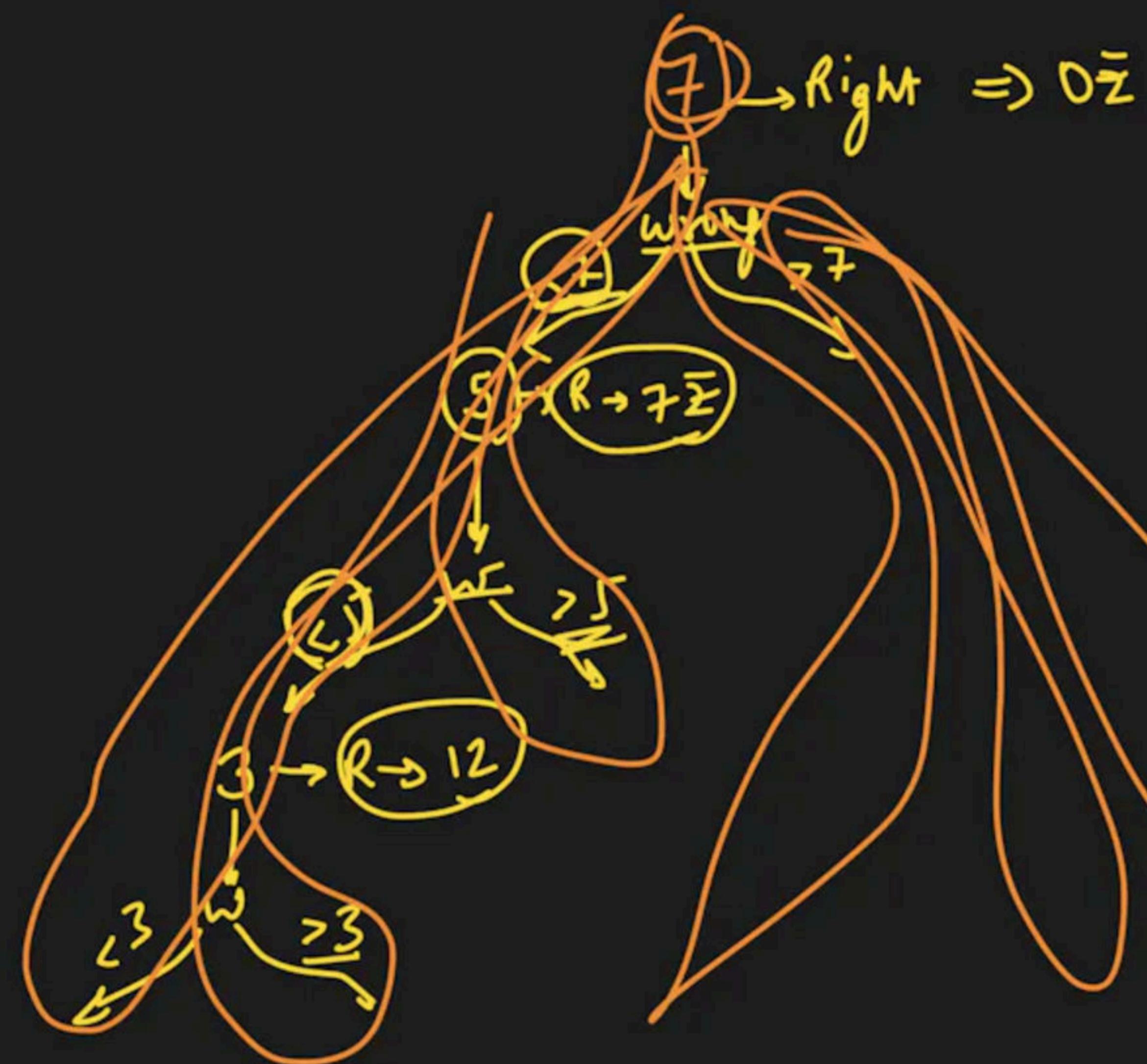
min amount → win

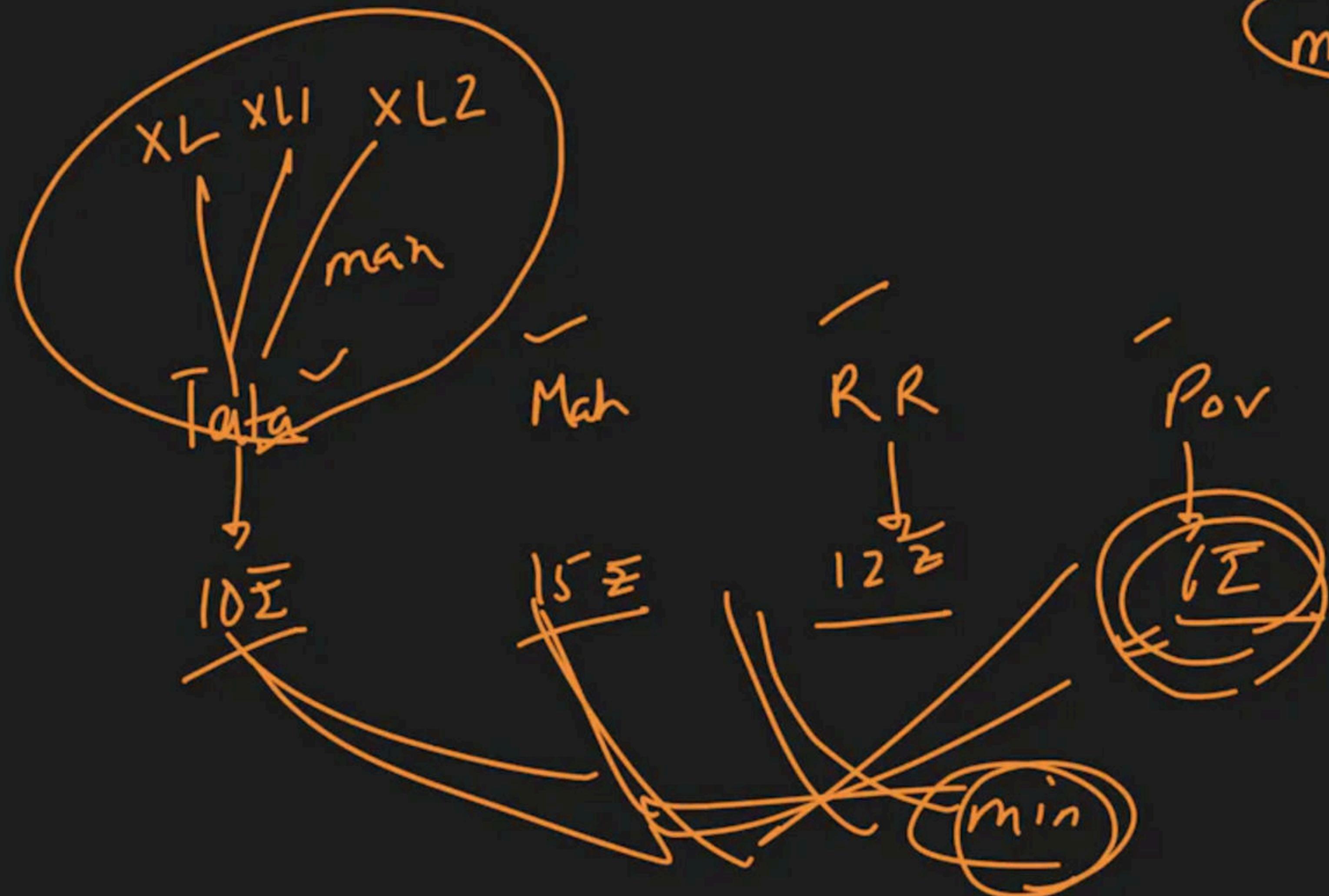


guarantee



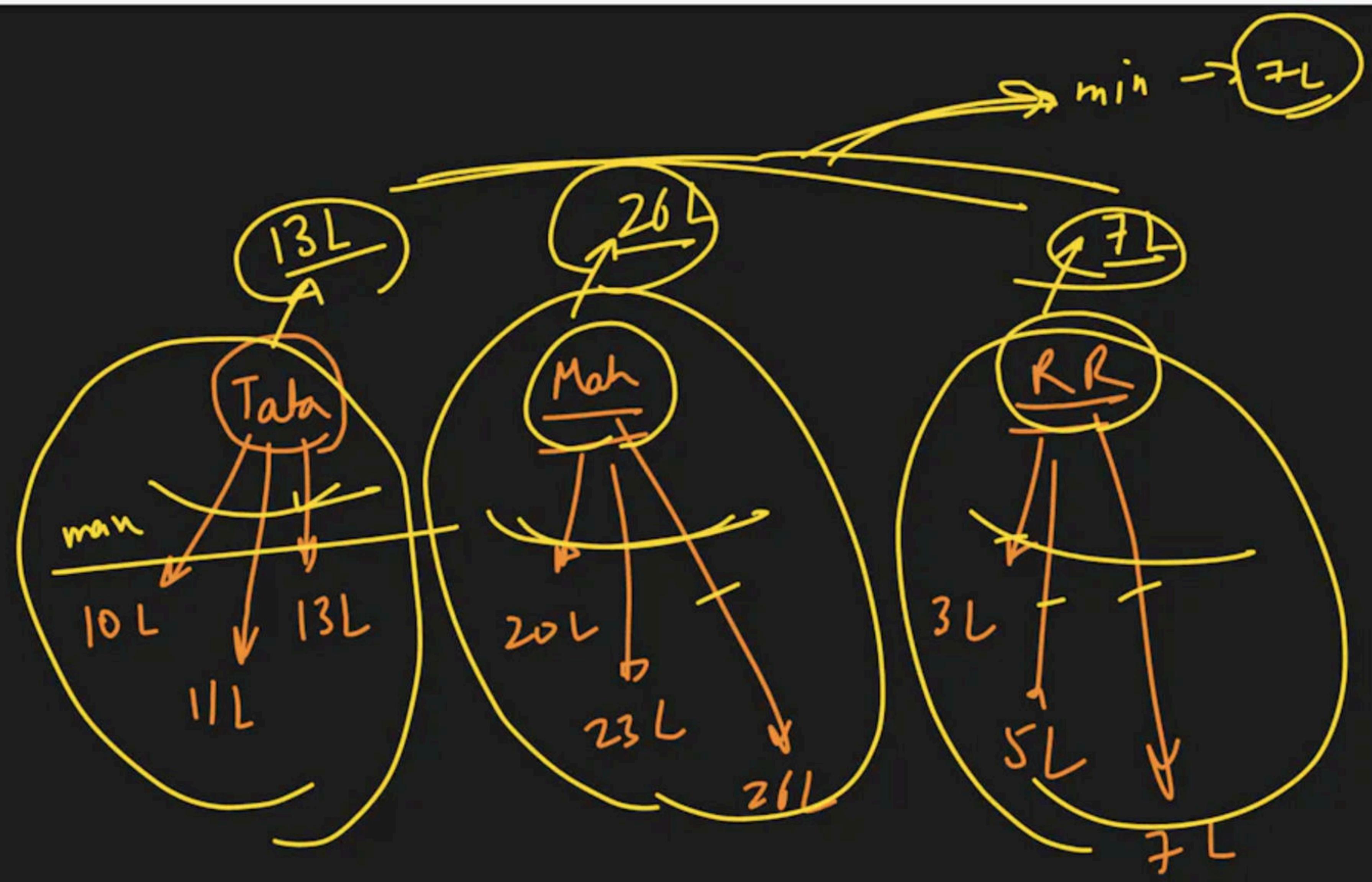
$n = 10$



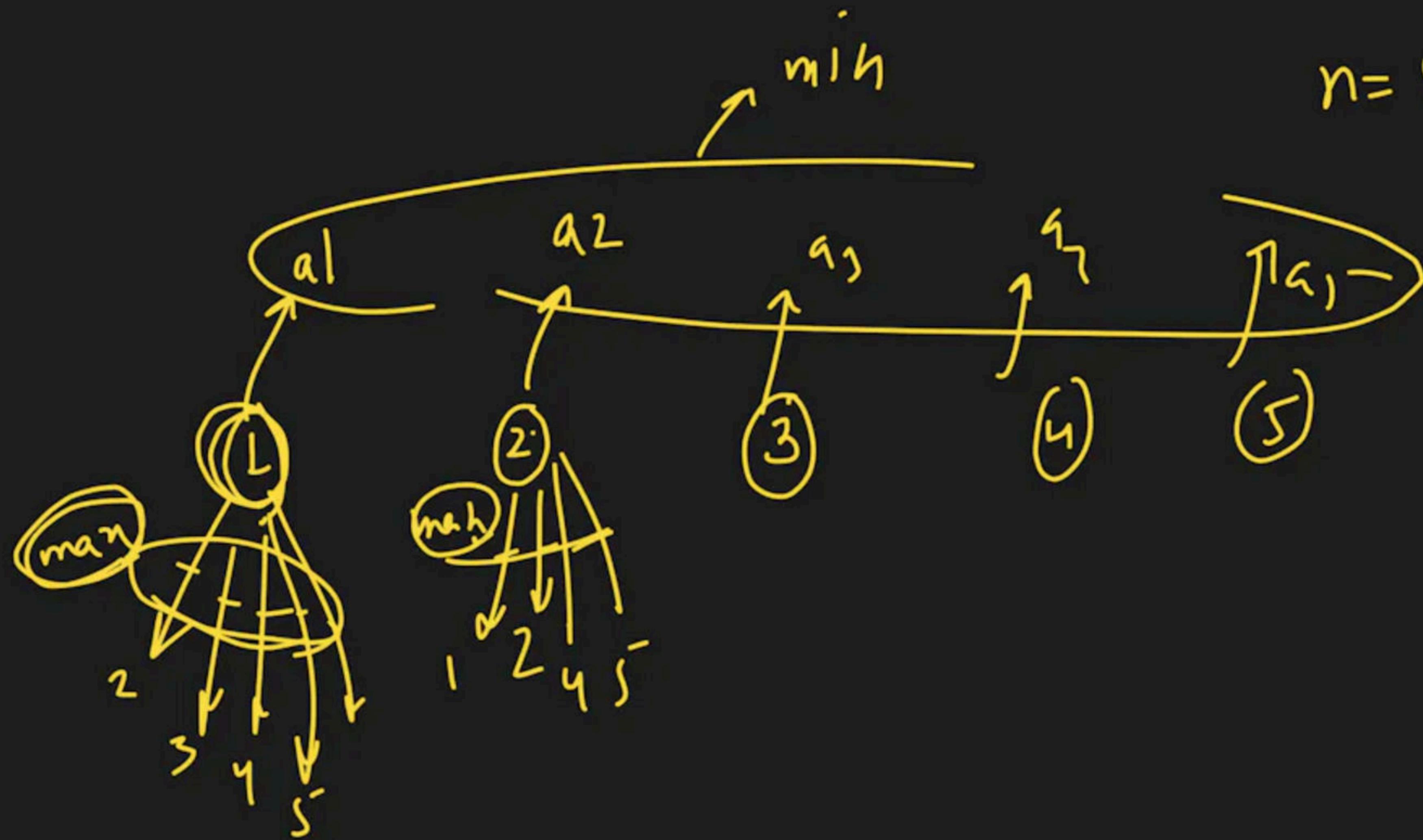


min money

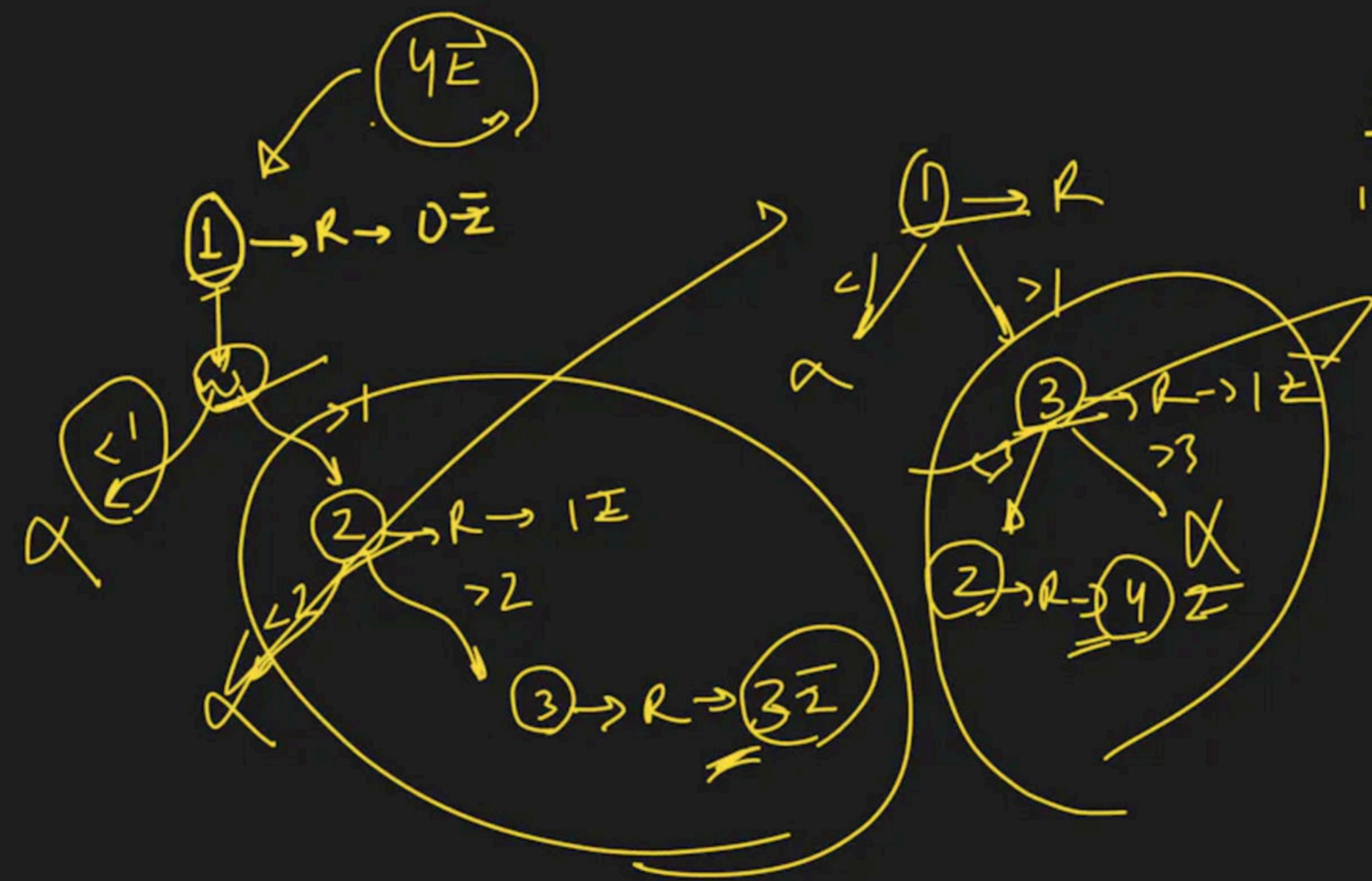
→ topmilk

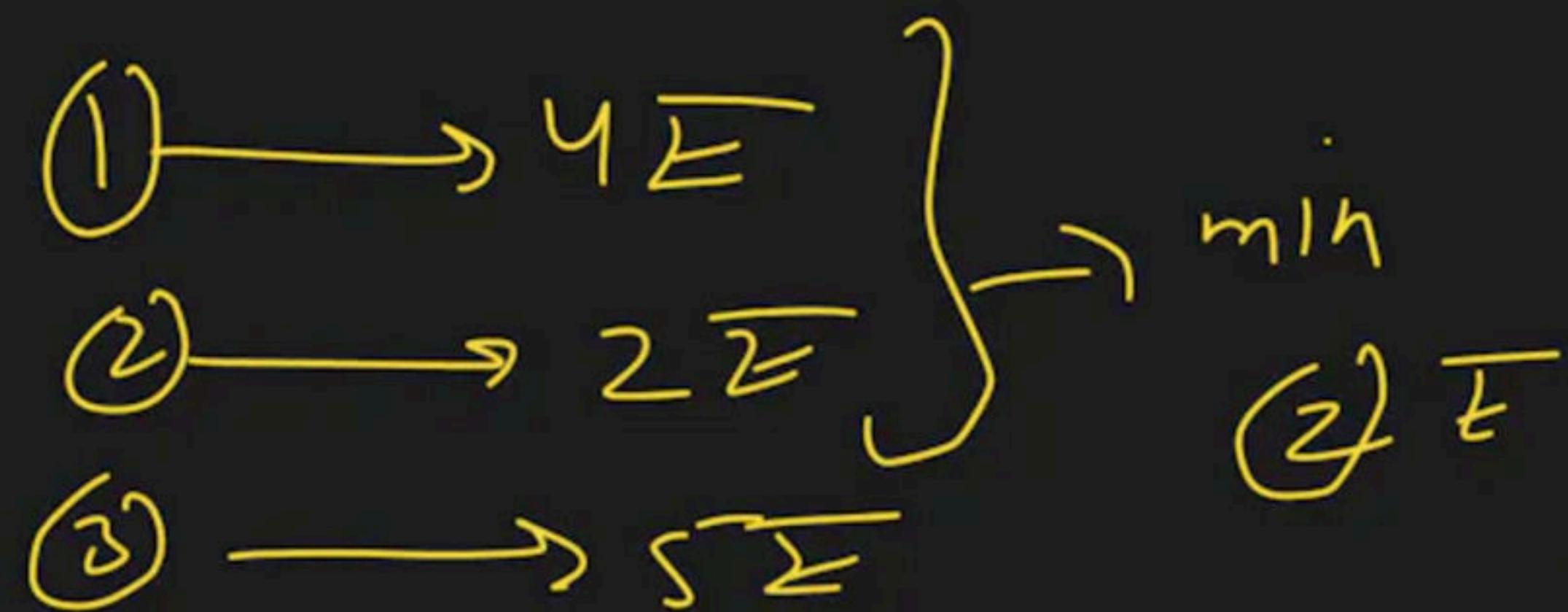
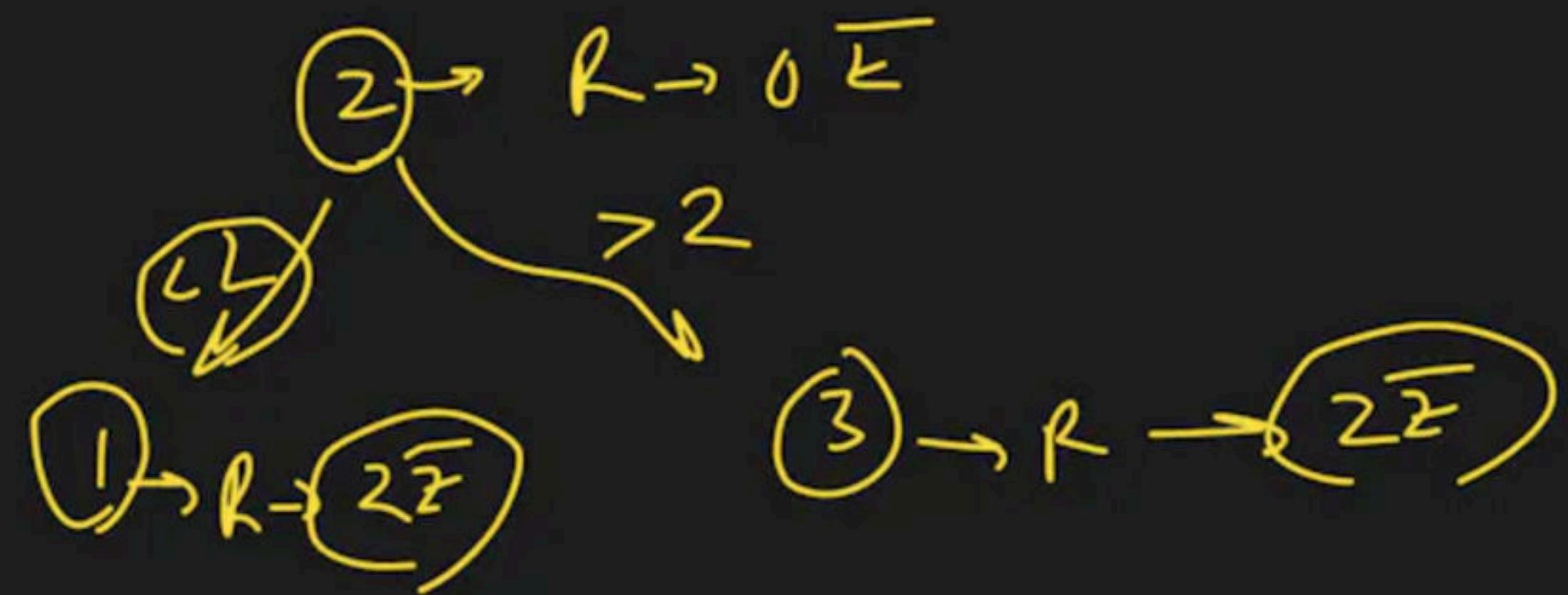


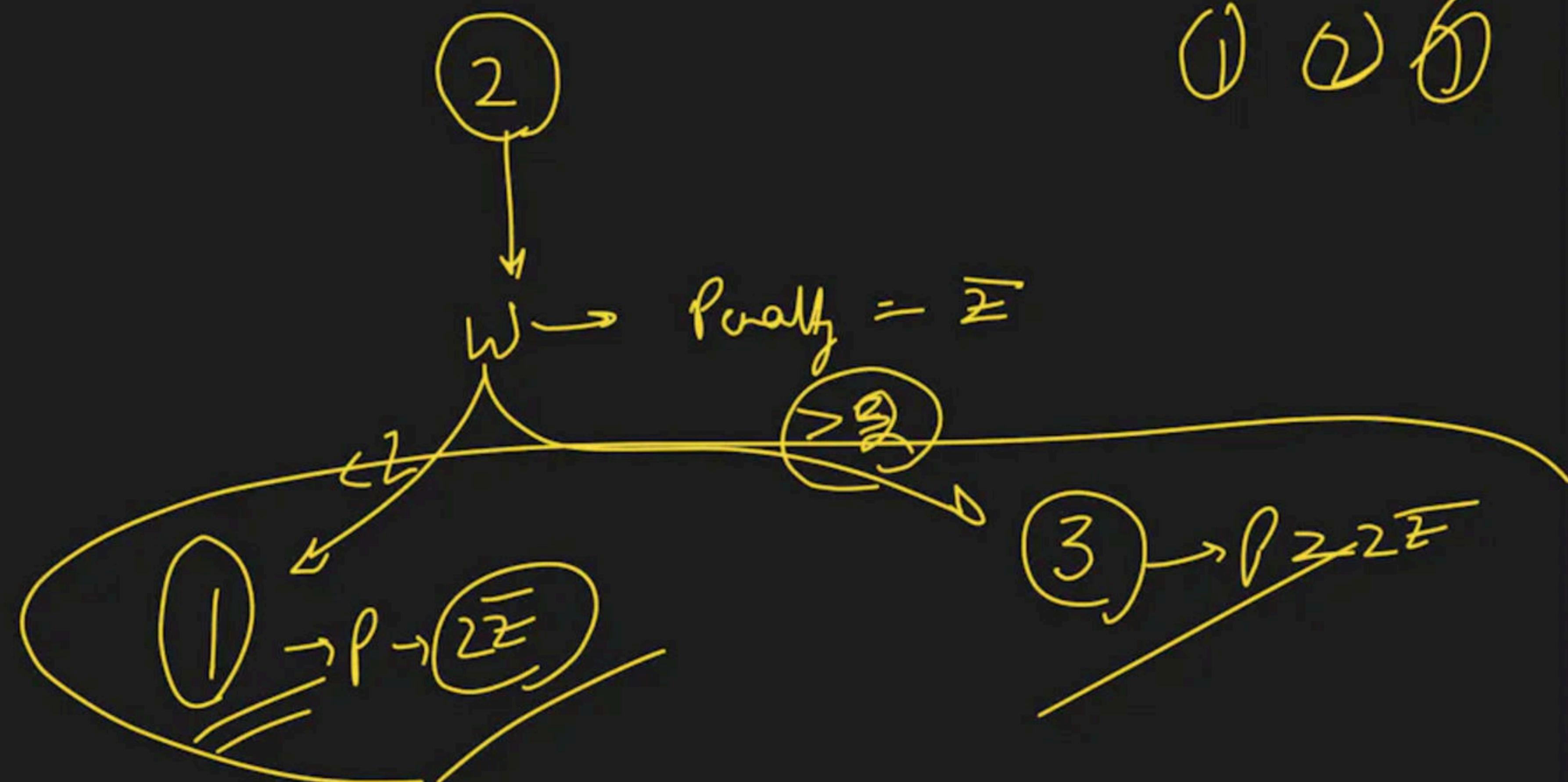
$n = 5$

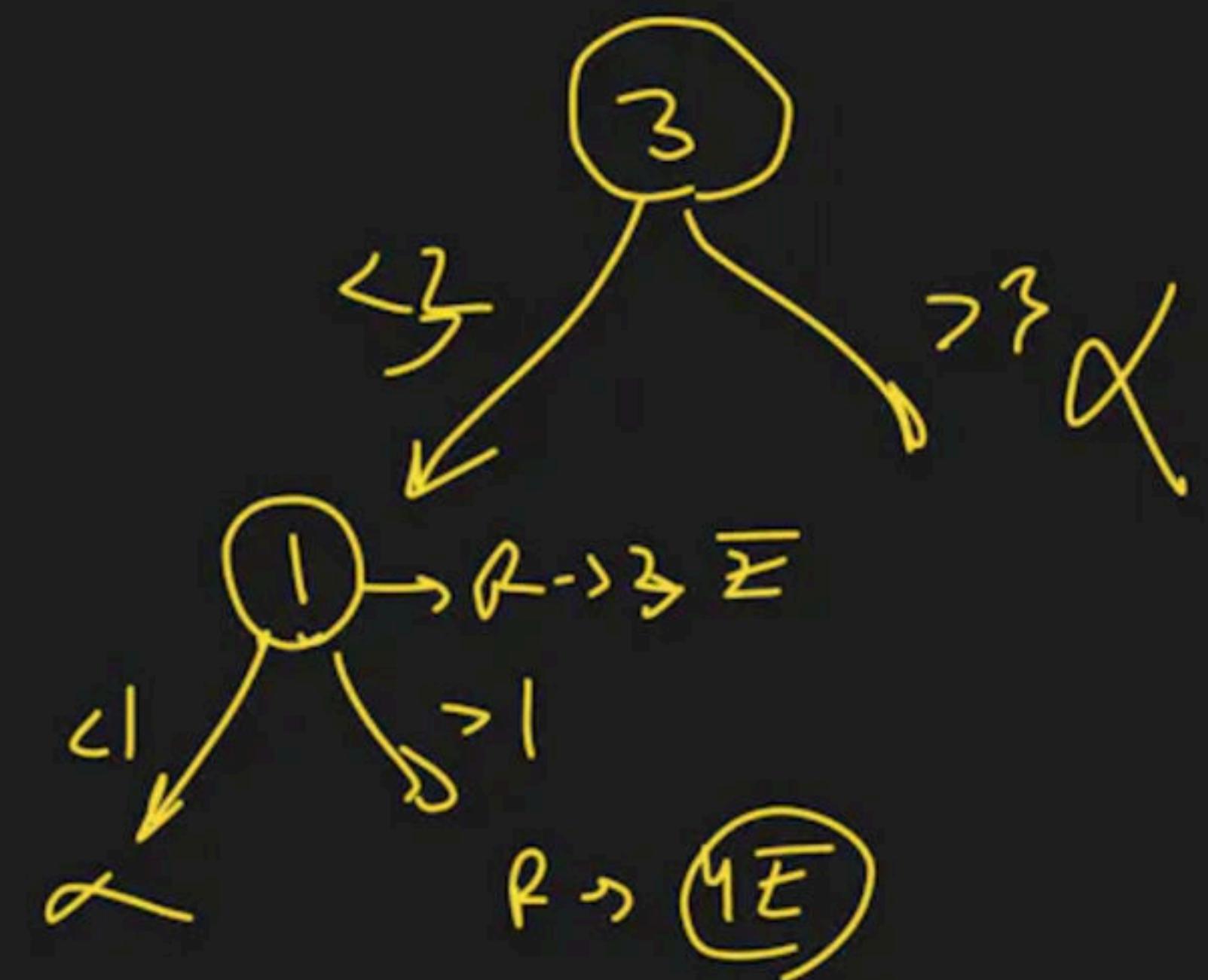


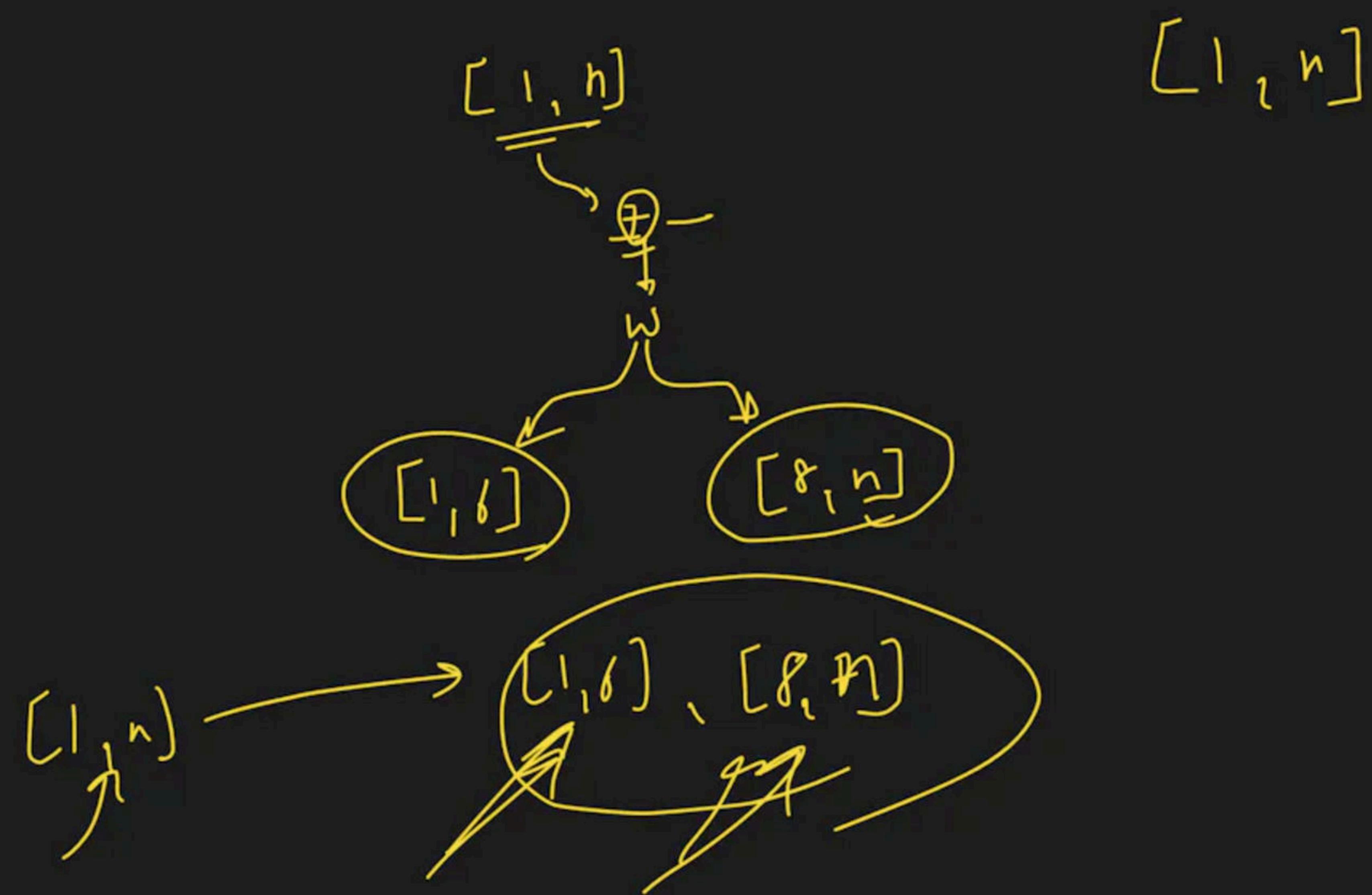
$n=3$
1 2]

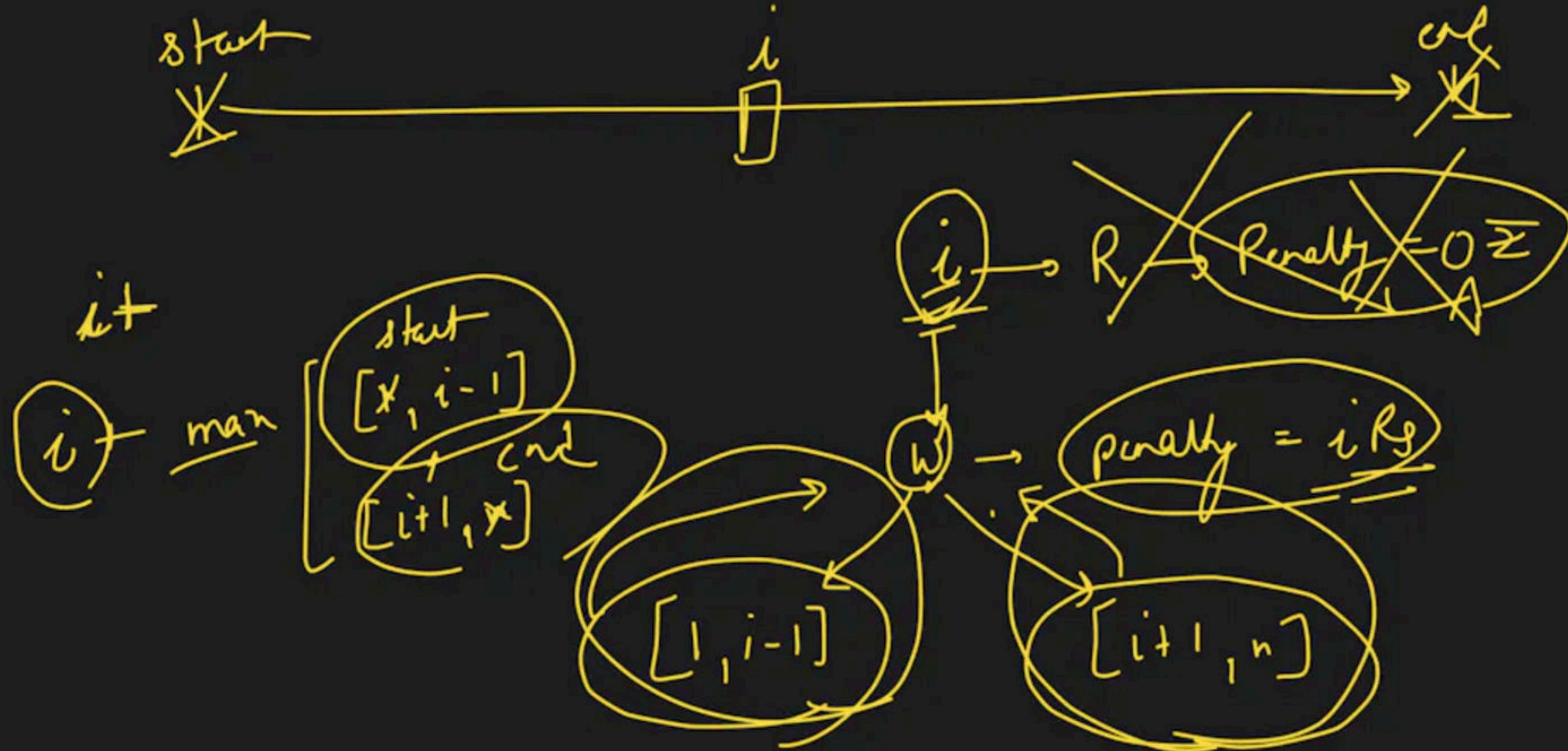


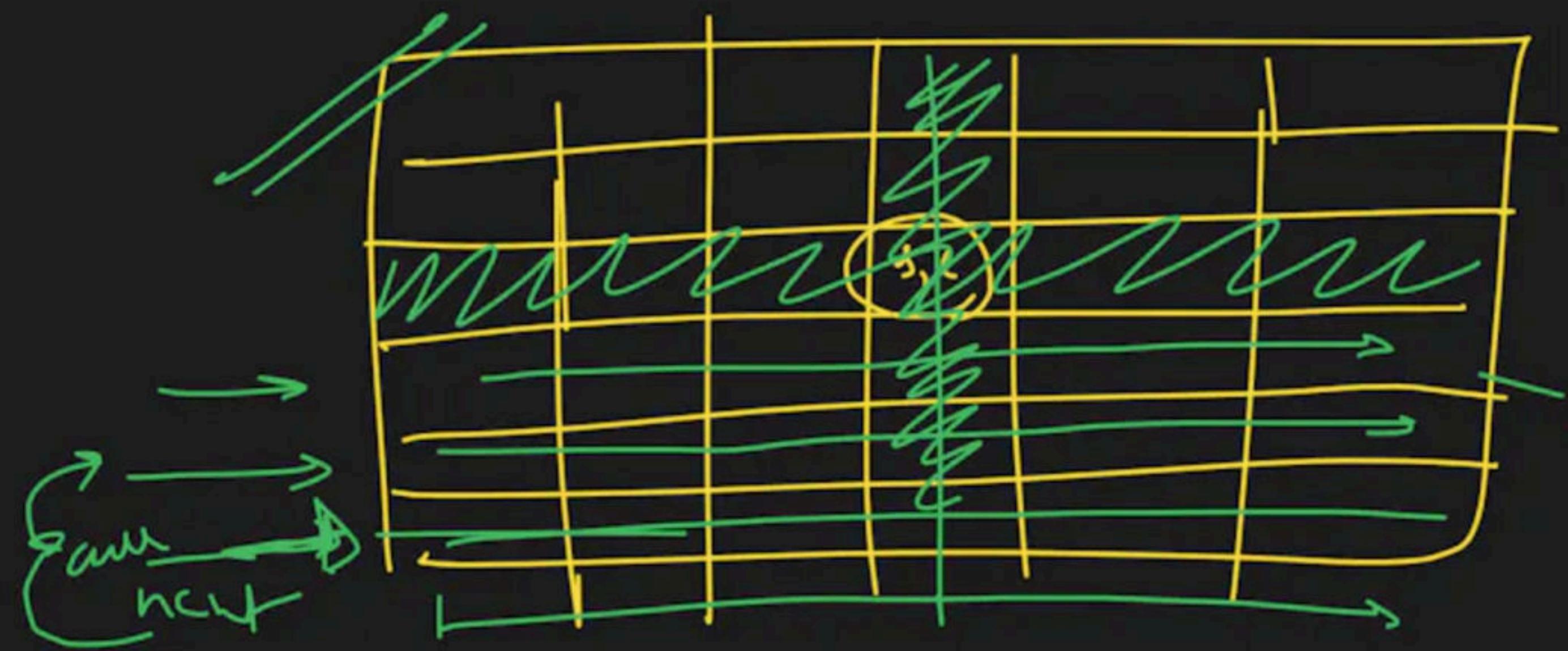




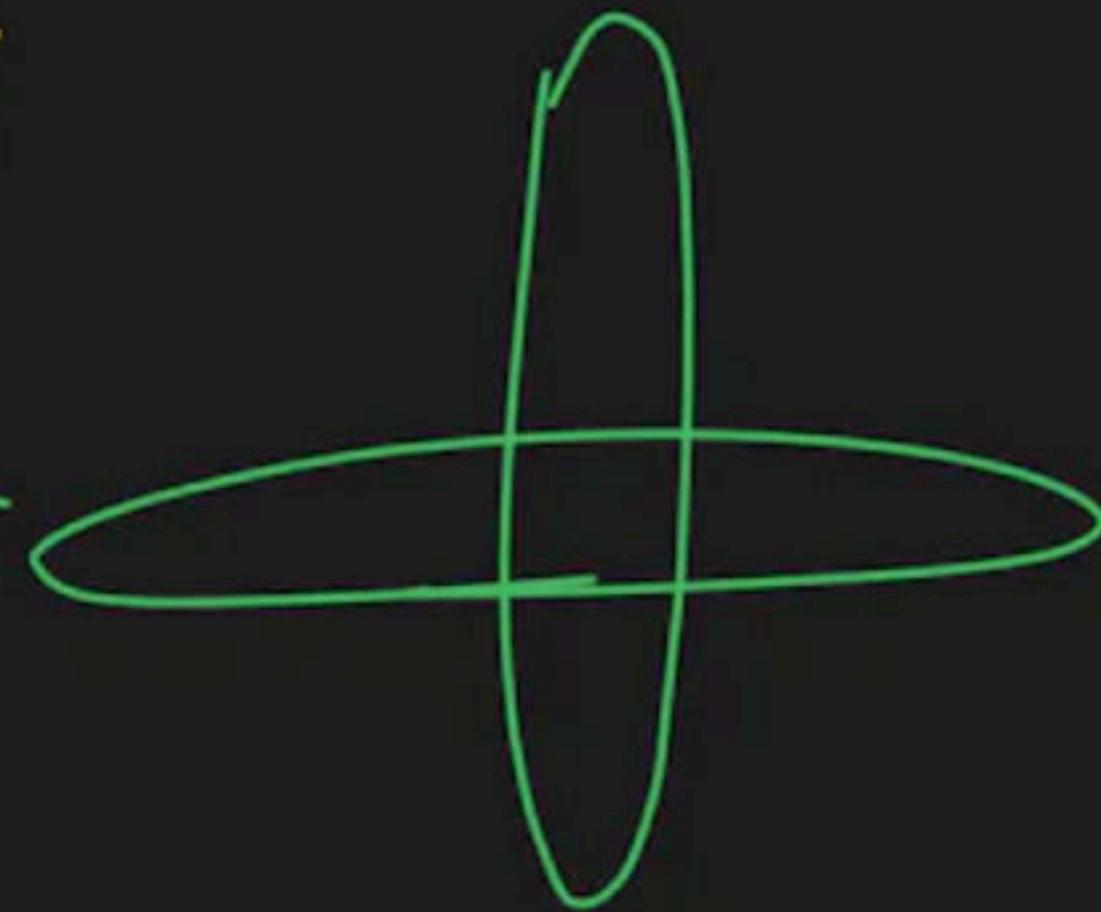








$d\rho[s][e]$



Code

for ($s \rightarrow n \rightarrow l$)

for ($c \rightarrow l \rightarrow c \leq n$)

for ($i \rightarrow l \rightarrow c \leq c$)

3

$i = 2$ ≤ 3 $i = 3$
 $s, i \rightarrow 2, 1$ $n = 3, 4, 5$
 $i+1, c \rightarrow 3, 3$

0	1	2	3
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0

Diagram illustrating the execution of nested loops. The outermost loop (s) runs from 0 to 3. The middle loop (l) runs from 0 to 3. The innermost loop (i) runs from 0 to 3. Handwritten annotations show the state of variables and indices at each iteration:

- Iteration (s, l, i) = (0, 0, 0): $s = 0$, $l = 0$, $i = 0$
- Iteration (s, l, i) = (0, 0, 1): $s = 0$, $l = 0$, $i = 1$ (highlighted)
- Iteration (s, l, i) = (0, 0, 2): $s = 0$, $l = 0$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (0, 0, 3): $s = 0$, $l = 0$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (0, 1, 0): $s = 0$, $l = 1$, $i = 0$
- Iteration (s, l, i) = (0, 1, 1): $s = 0$, $l = 1$, $i = 1$ (highlighted)
- Iteration (s, l, i) = (0, 1, 2): $s = 0$, $l = 1$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (0, 1, 3): $s = 0$, $l = 1$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (0, 2, 0): $s = 0$, $l = 2$, $i = 0$
- Iteration (s, l, i) = (0, 2, 1): $s = 0$, $l = 2$, $i = 1$ (highlighted)
- Iteration (s, l, i) = (0, 2, 2): $s = 0$, $l = 2$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (0, 2, 3): $s = 0$, $l = 2$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (0, 3, 0): $s = 0$, $l = 3$, $i = 0$
- Iteration (s, l, i) = (0, 3, 1): $s = 0$, $l = 3$, $i = 1$ (highlighted)
- Iteration (s, l, i) = (0, 3, 2): $s = 0$, $l = 3$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (0, 3, 3): $s = 0$, $l = 3$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (1, 0, 0): $s = 1$, $l = 0$, $i = 0$
- Iteration (s, l, i) = (1, 0, 1): $s = 1$, $l = 0$, $i = 1$ (highlighted)
- Iteration (s, l, i) = (1, 0, 2): $s = 1$, $l = 0$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (1, 0, 3): $s = 1$, $l = 0$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (1, 1, 0): $s = 1$, $l = 1$, $i = 0$
- Iteration (s, l, i) = (1, 1, 1): $s = 1$, $l = 1$, $i = 1$ (highlighted)
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- Iteration (s, l, i) = (1, 1, 3): $s = 1$, $l = 1$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (1, 2, 0): $s = 1$, $l = 2$, $i = 0$
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- Iteration (s, l, i) = (1, 2, 3): $s = 1$, $l = 2$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (1, 3, 0): $s = 1$, $l = 3$, $i = 0$
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- Iteration (s, l, i) = (1, 3, 2): $s = 1$, $l = 3$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (1, 3, 3): $s = 1$, $l = 3$, $i = 3$ (highlighted)
- Iteration (s, l, i) = (2, 0, 0): $s = 2$, $l = 0$, $i = 0$
- Iteration (s, l, i) = (2, 0, 1): $s = 2$, $l = 0$, $i = 1$ (highlighted)
- Iteration (s, l, i) = (2, 0, 2): $s = 2$, $l = 0$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (2, 0, 3): $s = 2$, $l = 0$, $i = 3$ (highlighted)
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- Iteration (s, l, i) = (3, 3, 2): $s = 3$, $l = 3$, $i = 2$ (highlighted)
- Iteration (s, l, i) = (3, 3, 3): $s = 3$, $l = 3$, $i = 3$ (highlighted)

$h = \delta$

$\delta = *$

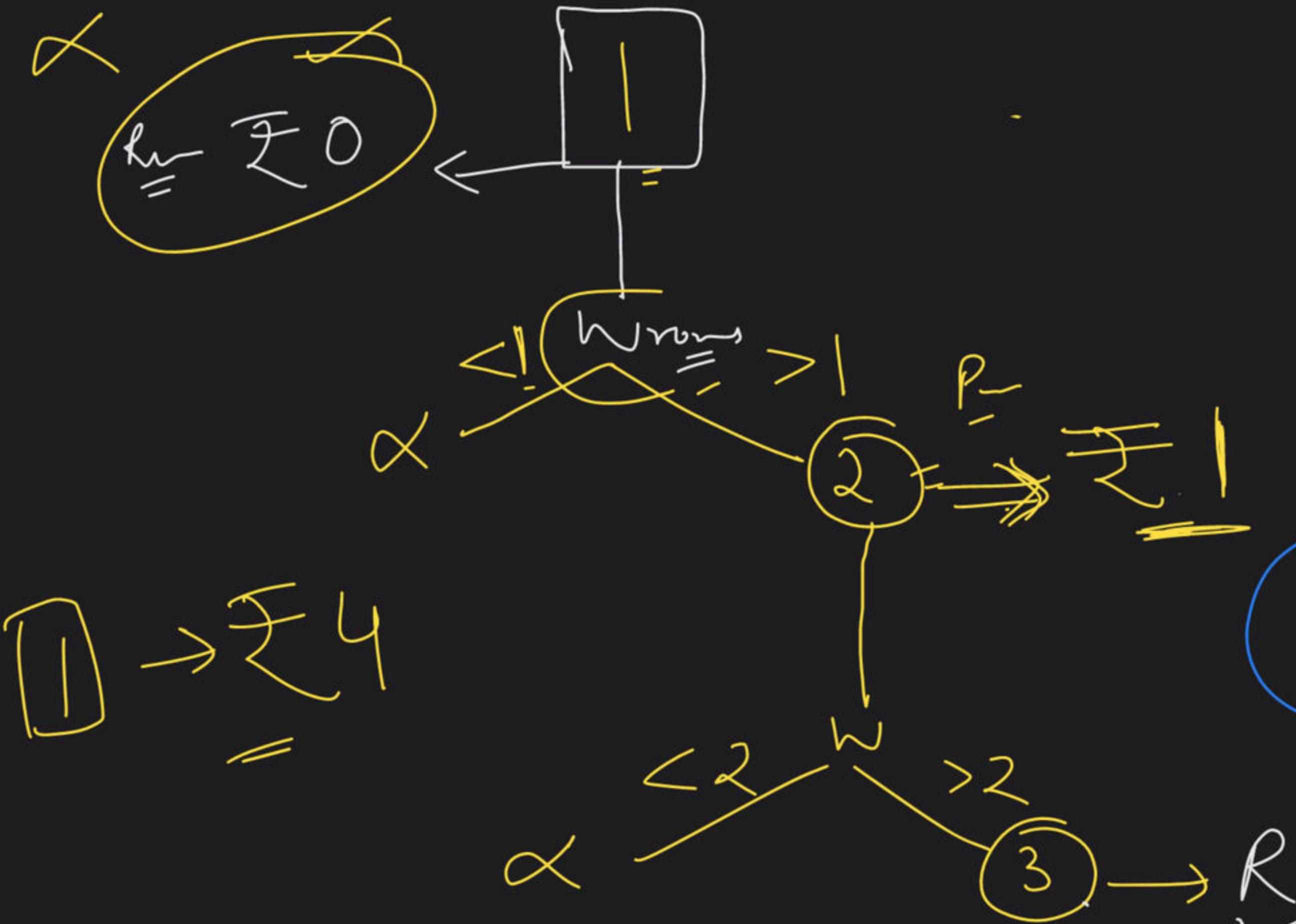


for ($i \rightarrow \delta \rightarrow c$)

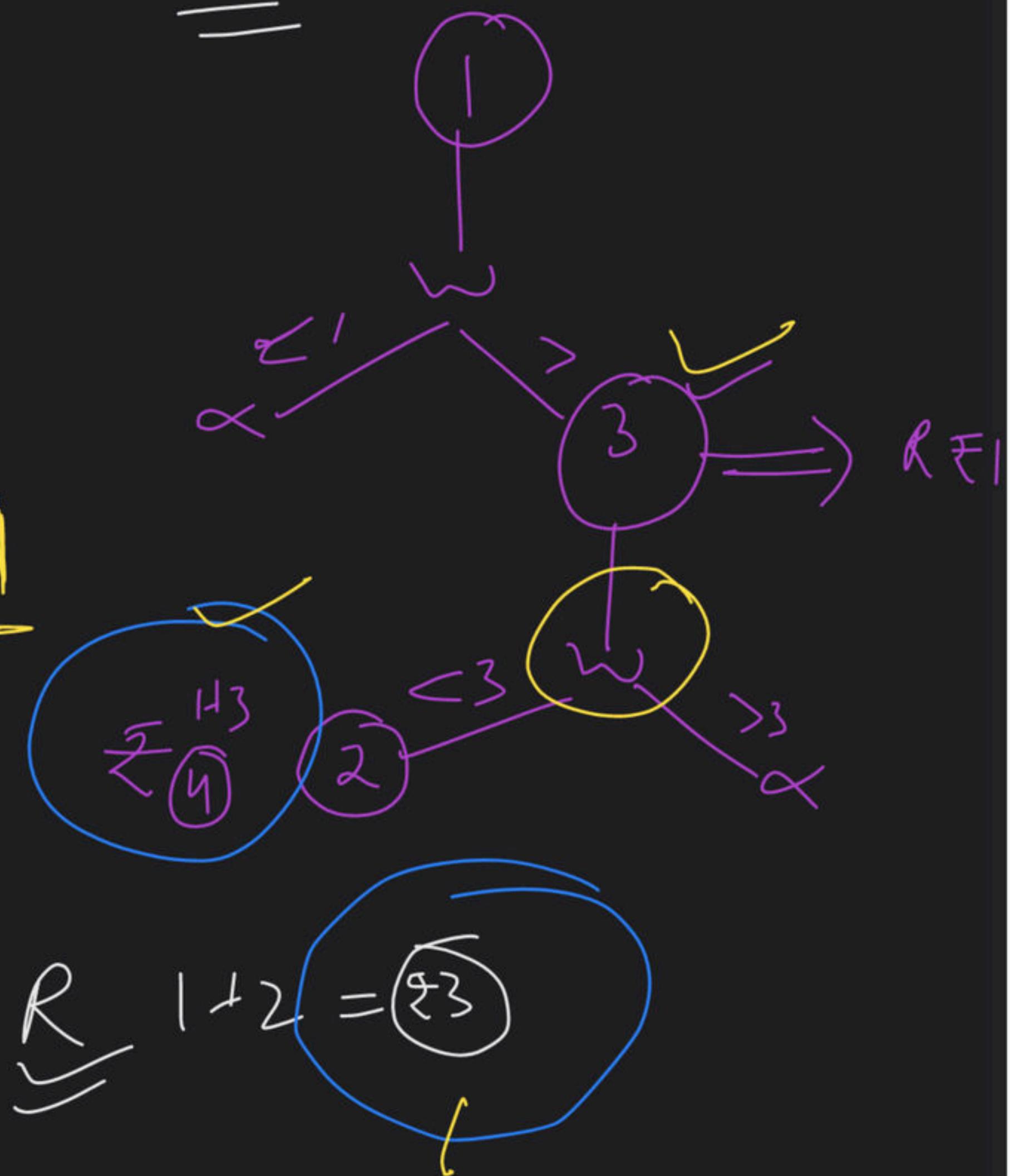
$d\rho(i-1)[c]$

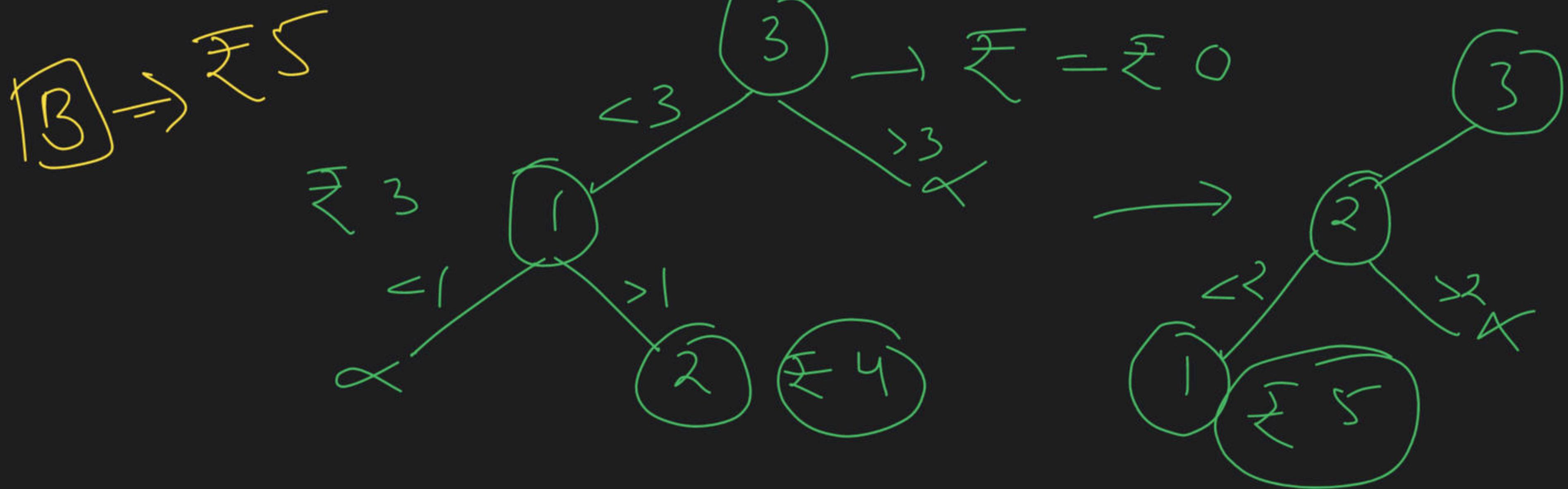
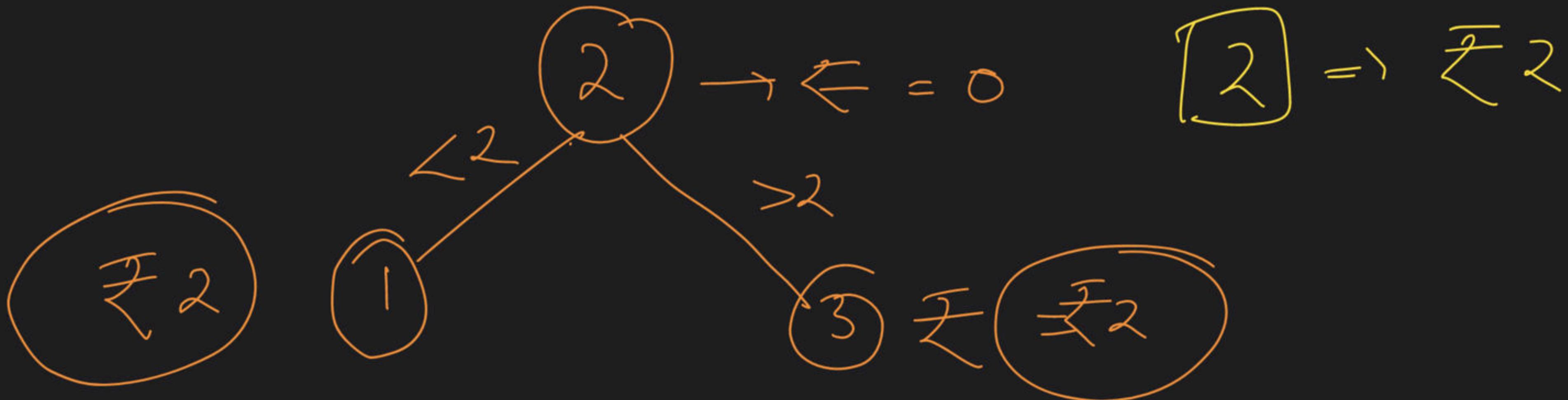
0
-
1
2
]
y
17

\Rightarrow $1 \rightarrow N$



$N = 3$





D \Rightarrow ΣY

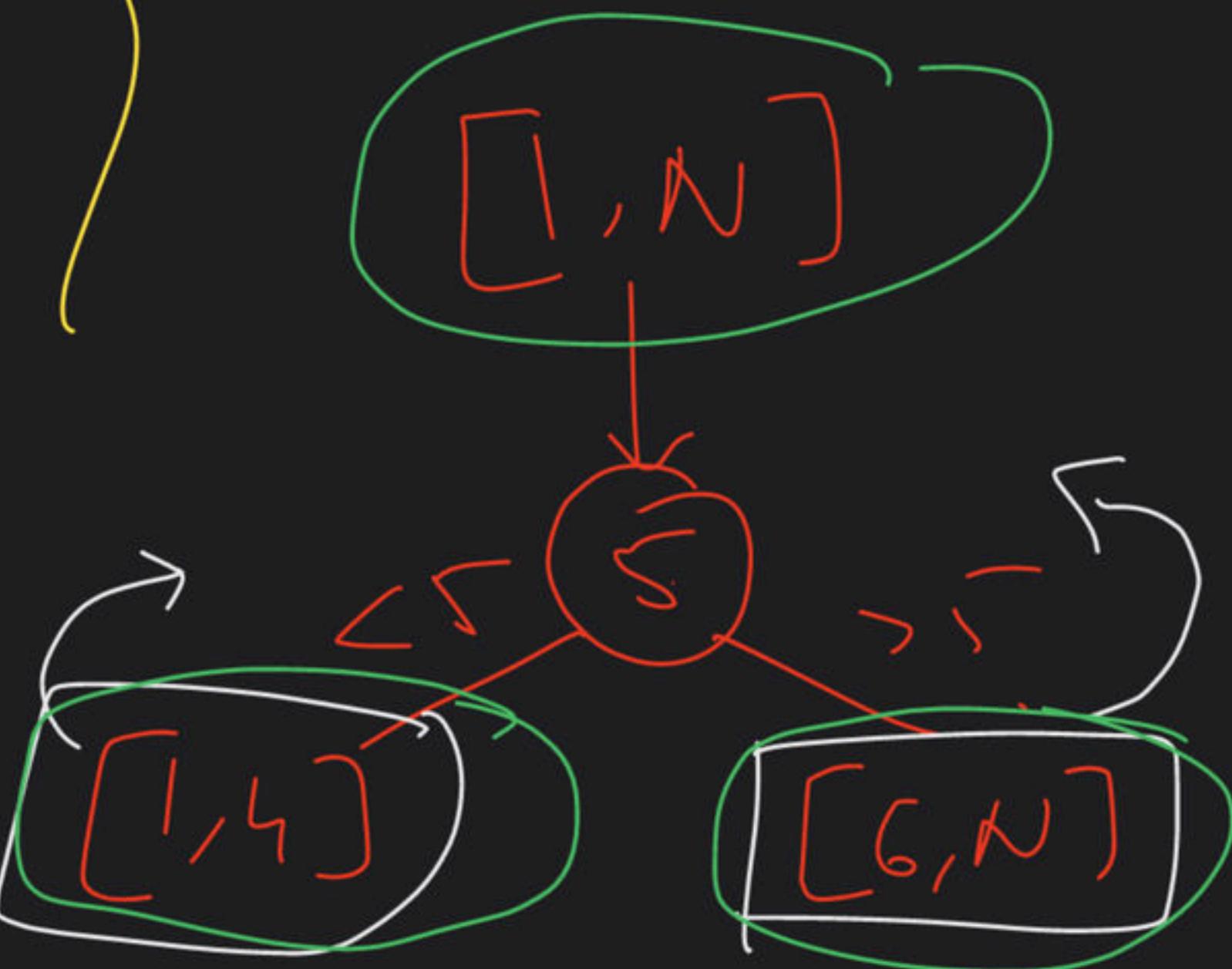
2 min Break

2 \Rightarrow $\Sigma 2$

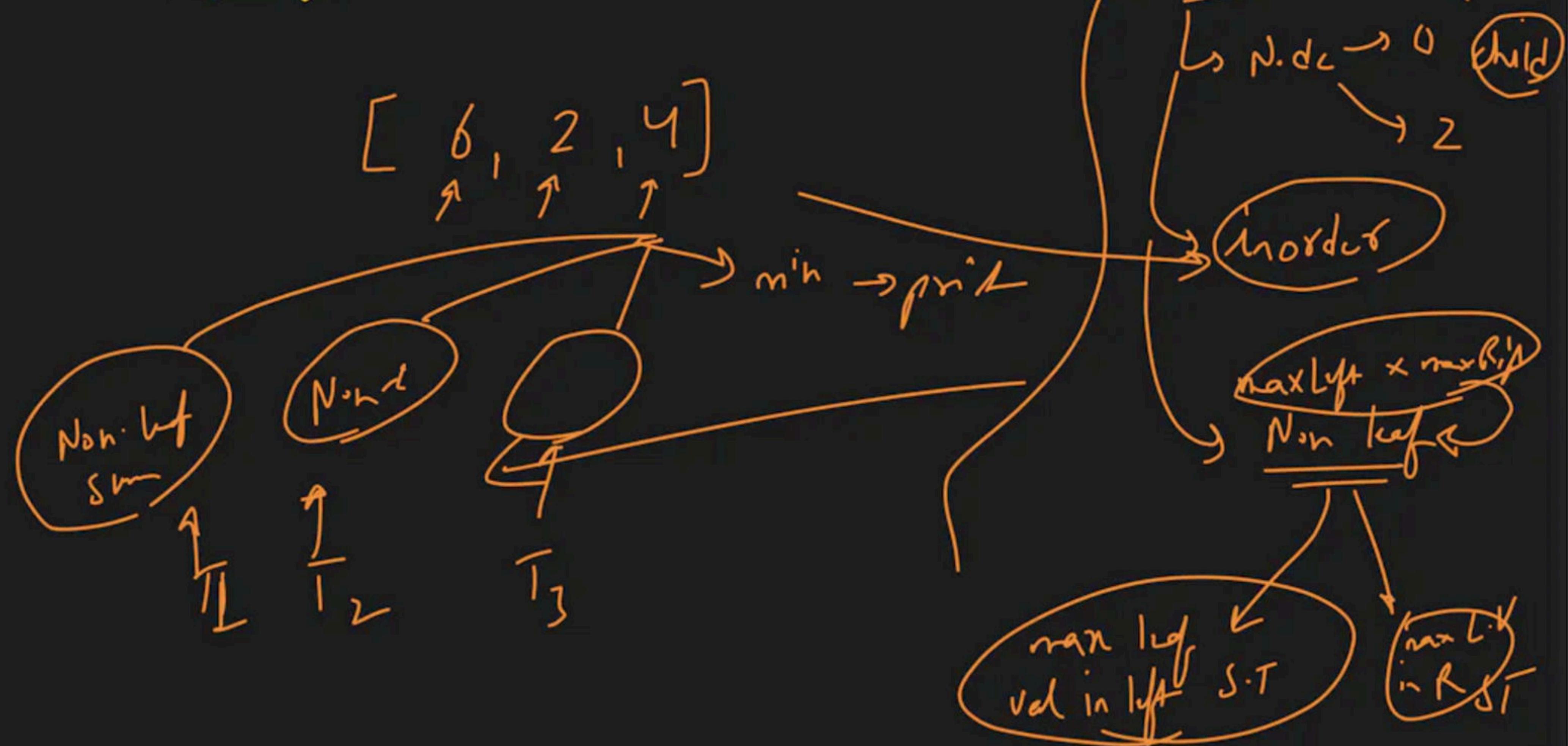
Reload

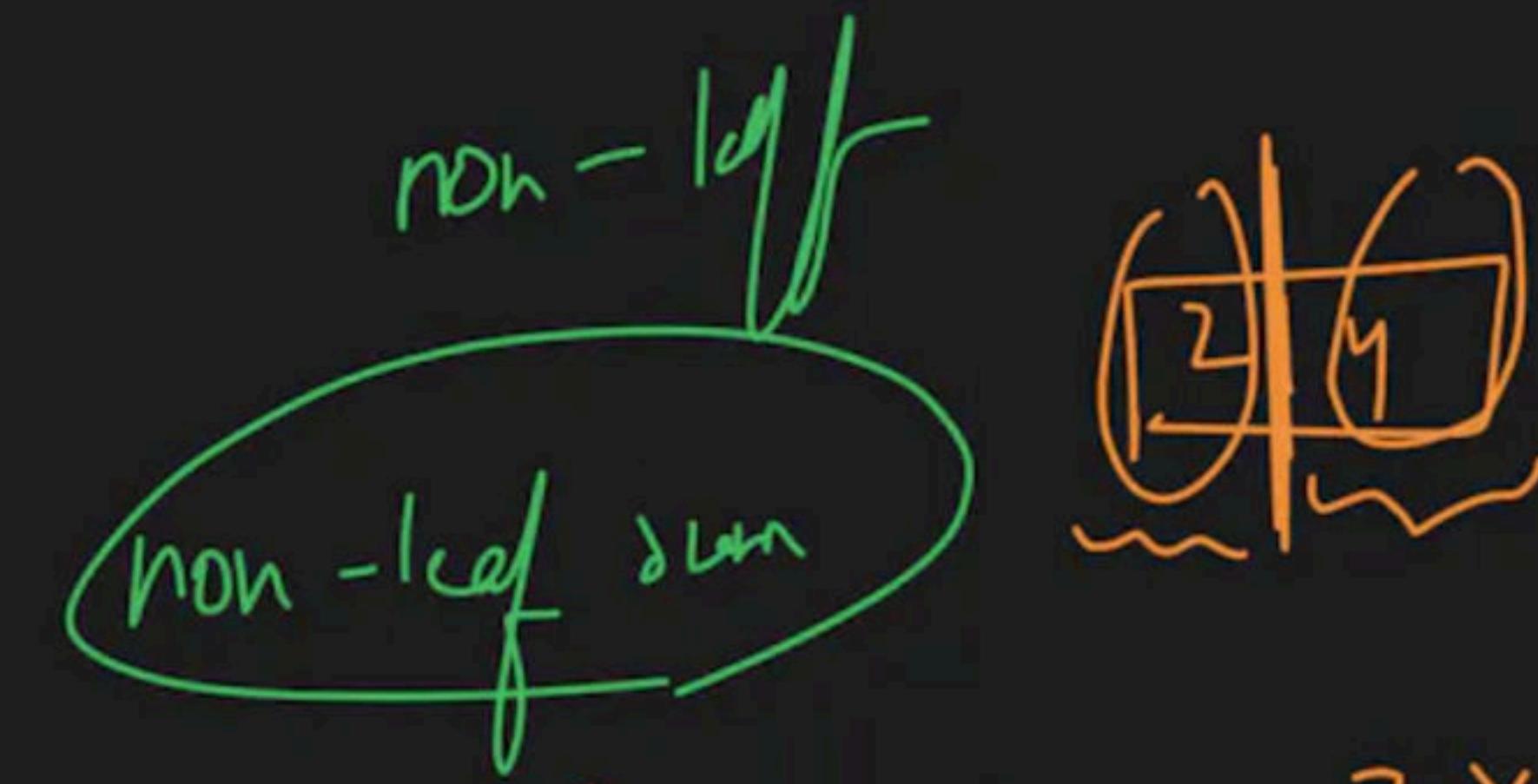
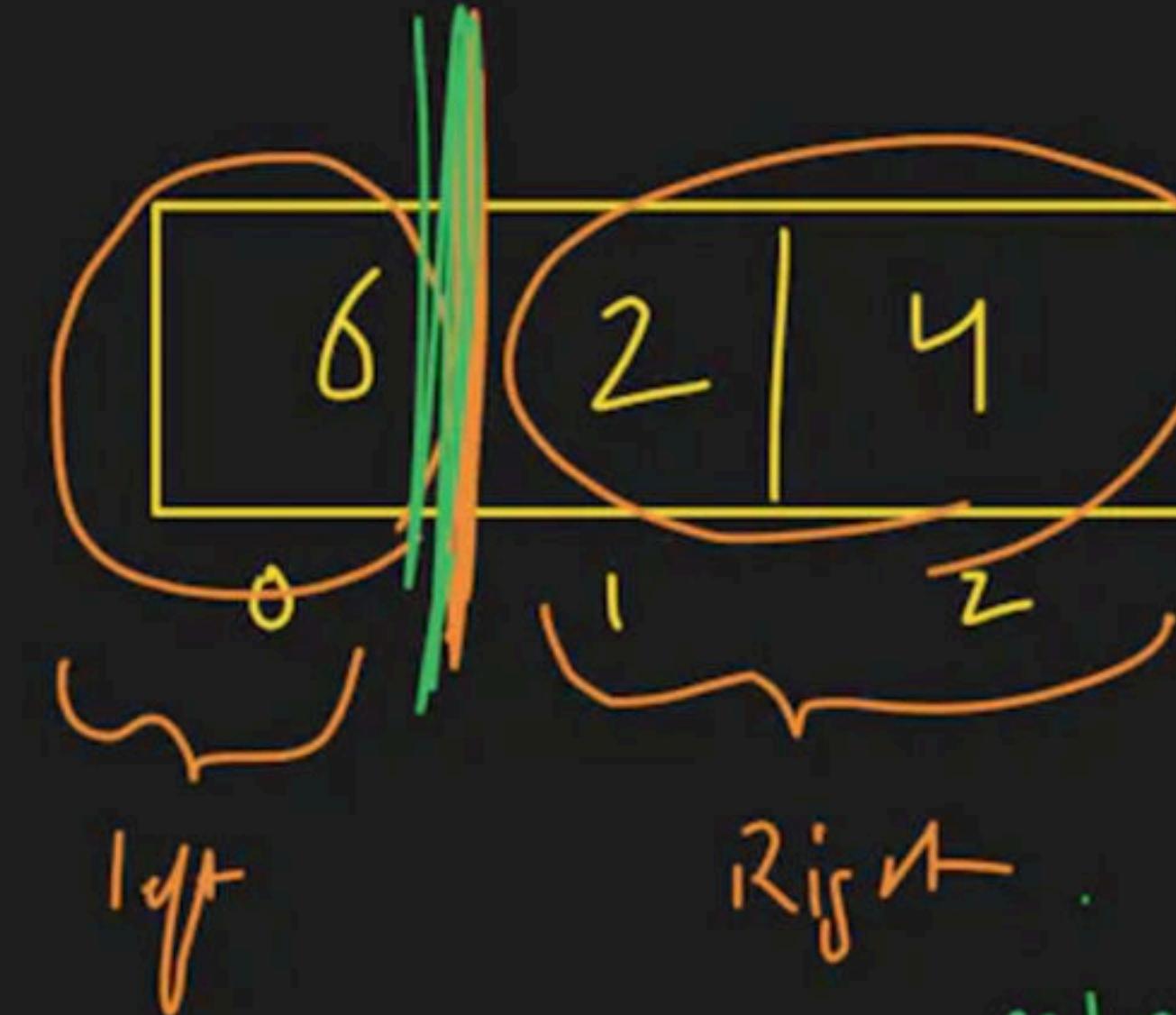
min = $\Sigma 2$

B \Rightarrow ΣS

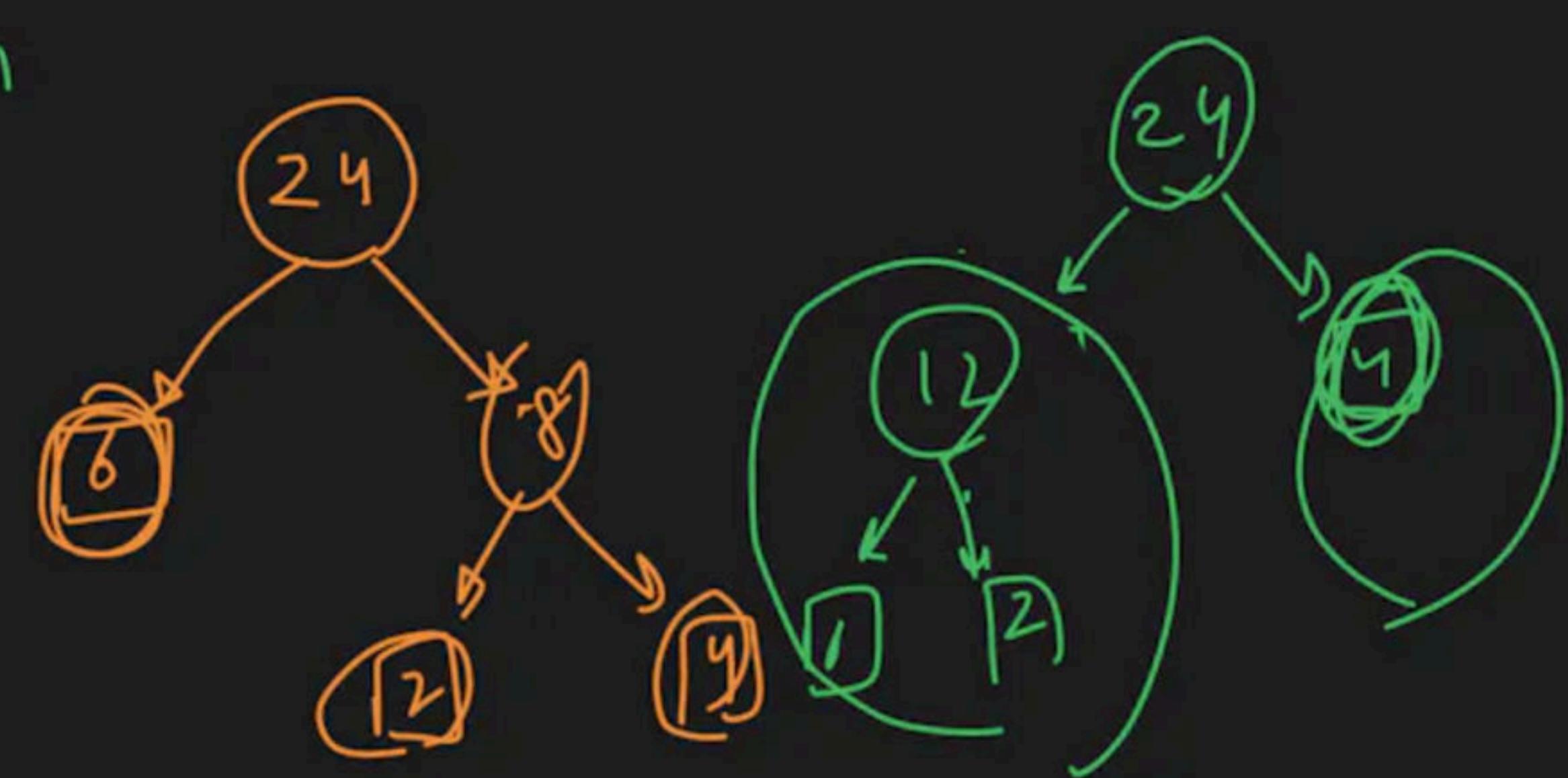


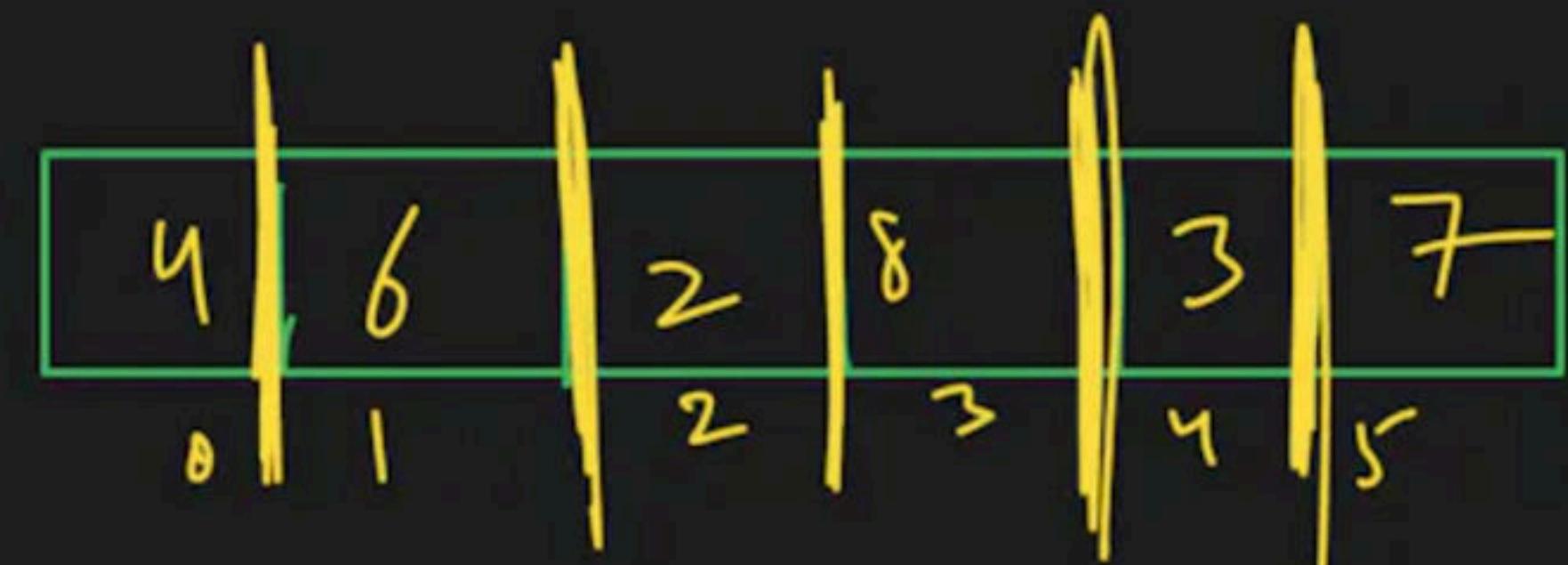
→ MCT from Leaf Values :-





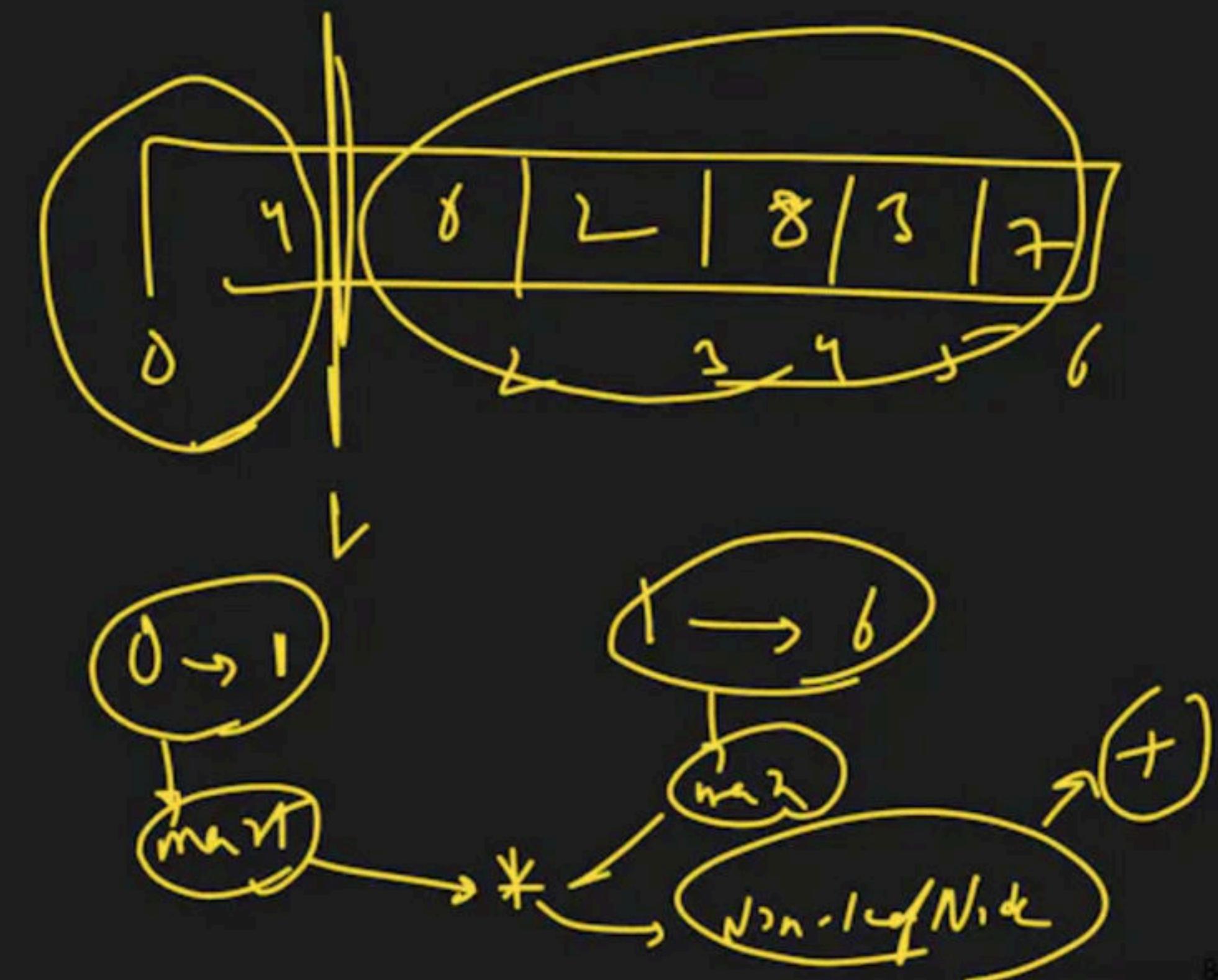
$$6 \times 4 = 24$$

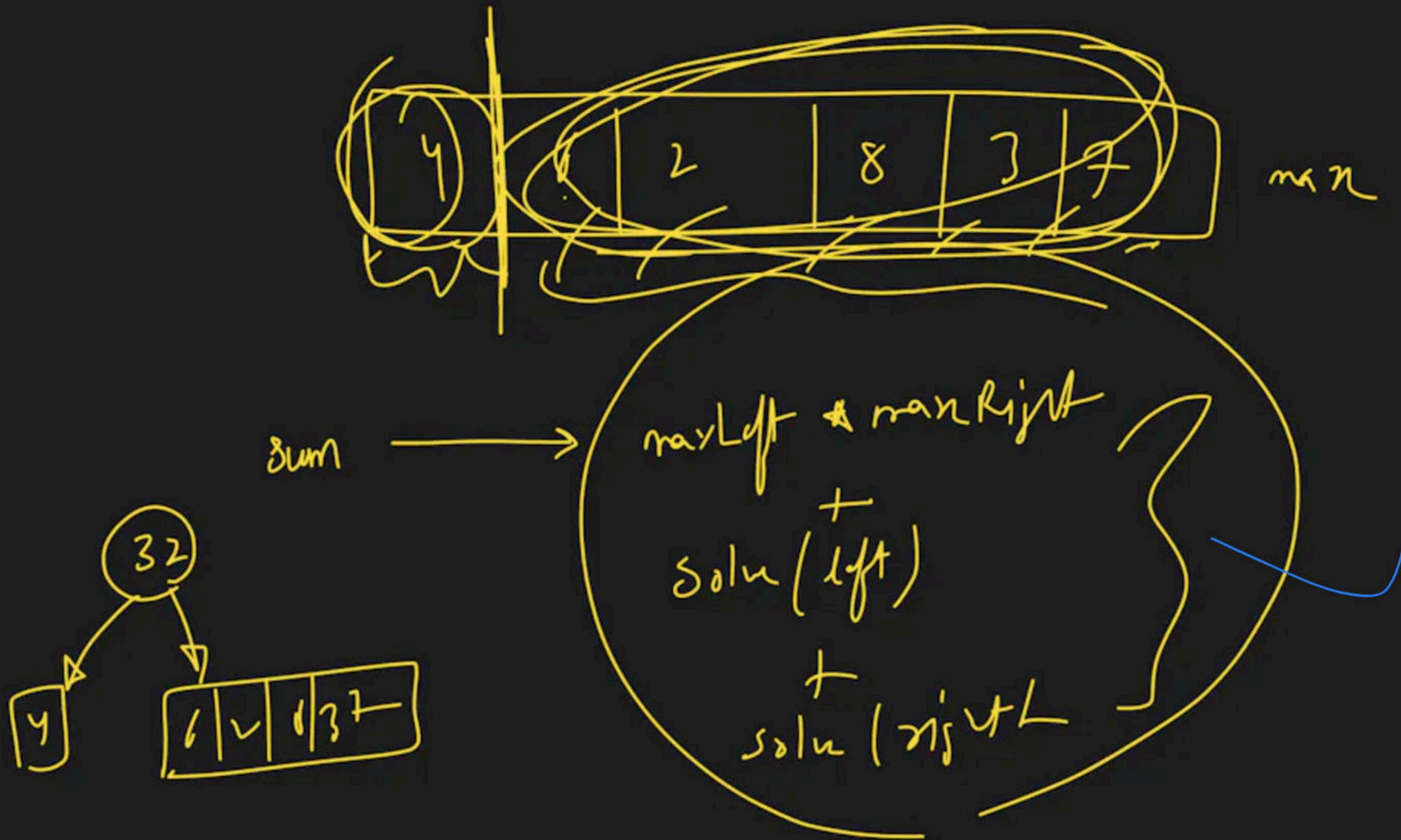




an_1
 an_2
 an_3
 an_4
 an_5

min





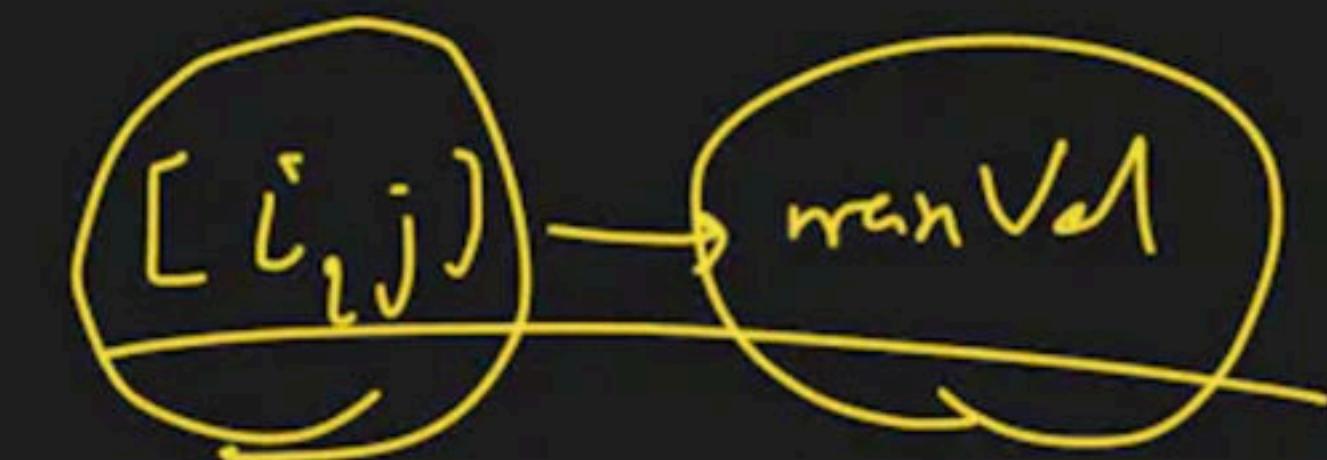
pre-comput

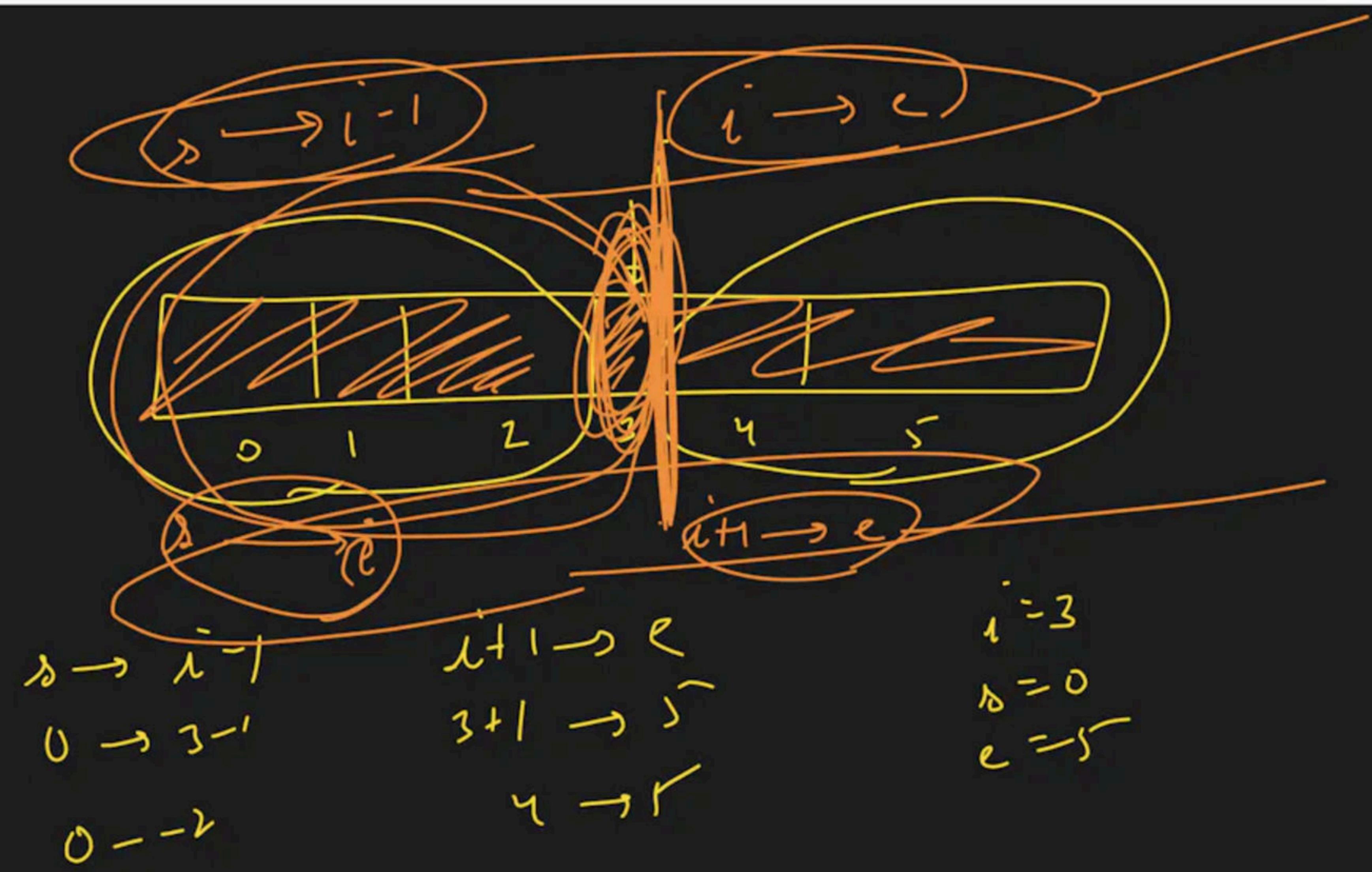
map(pair<int, int> → int)

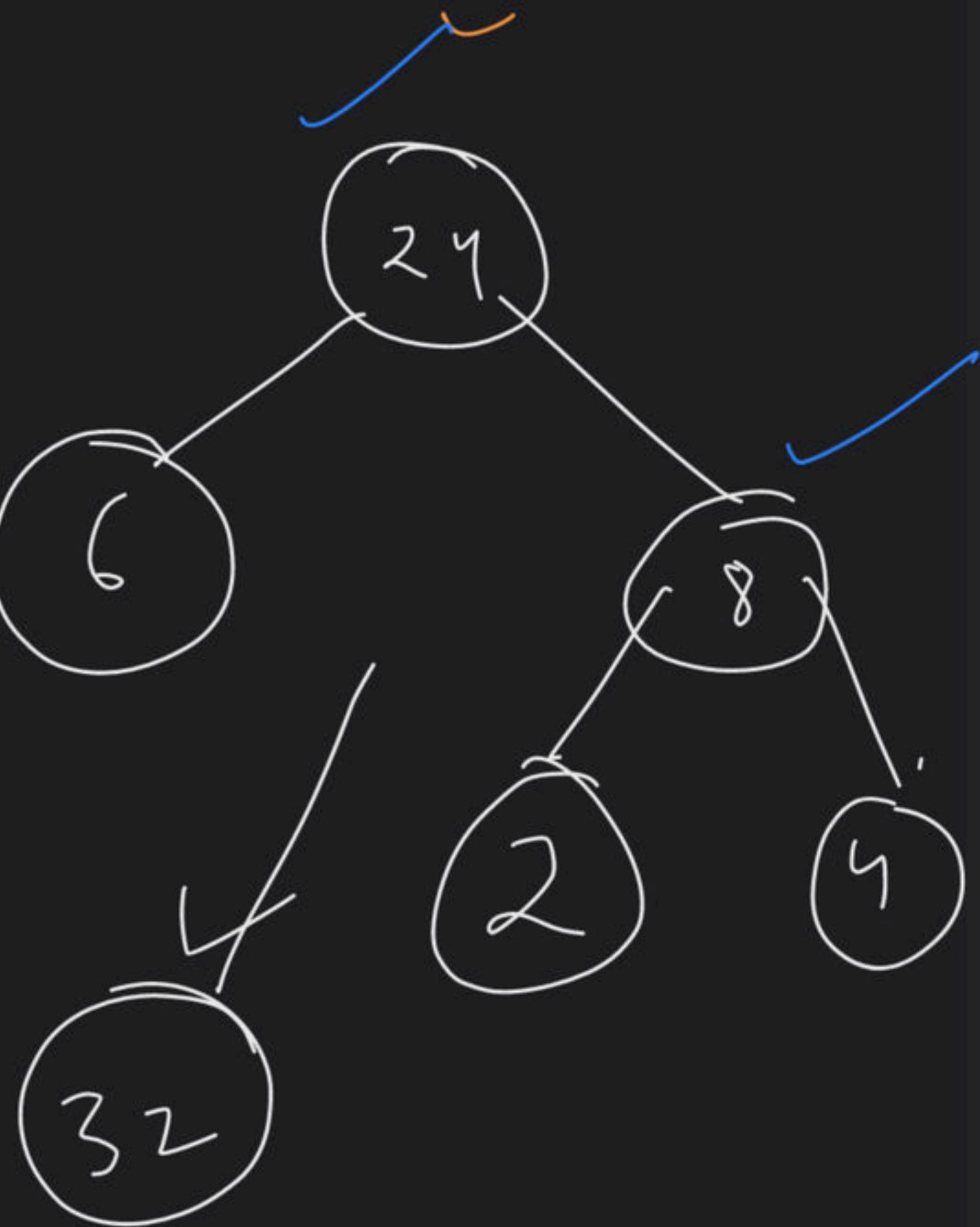
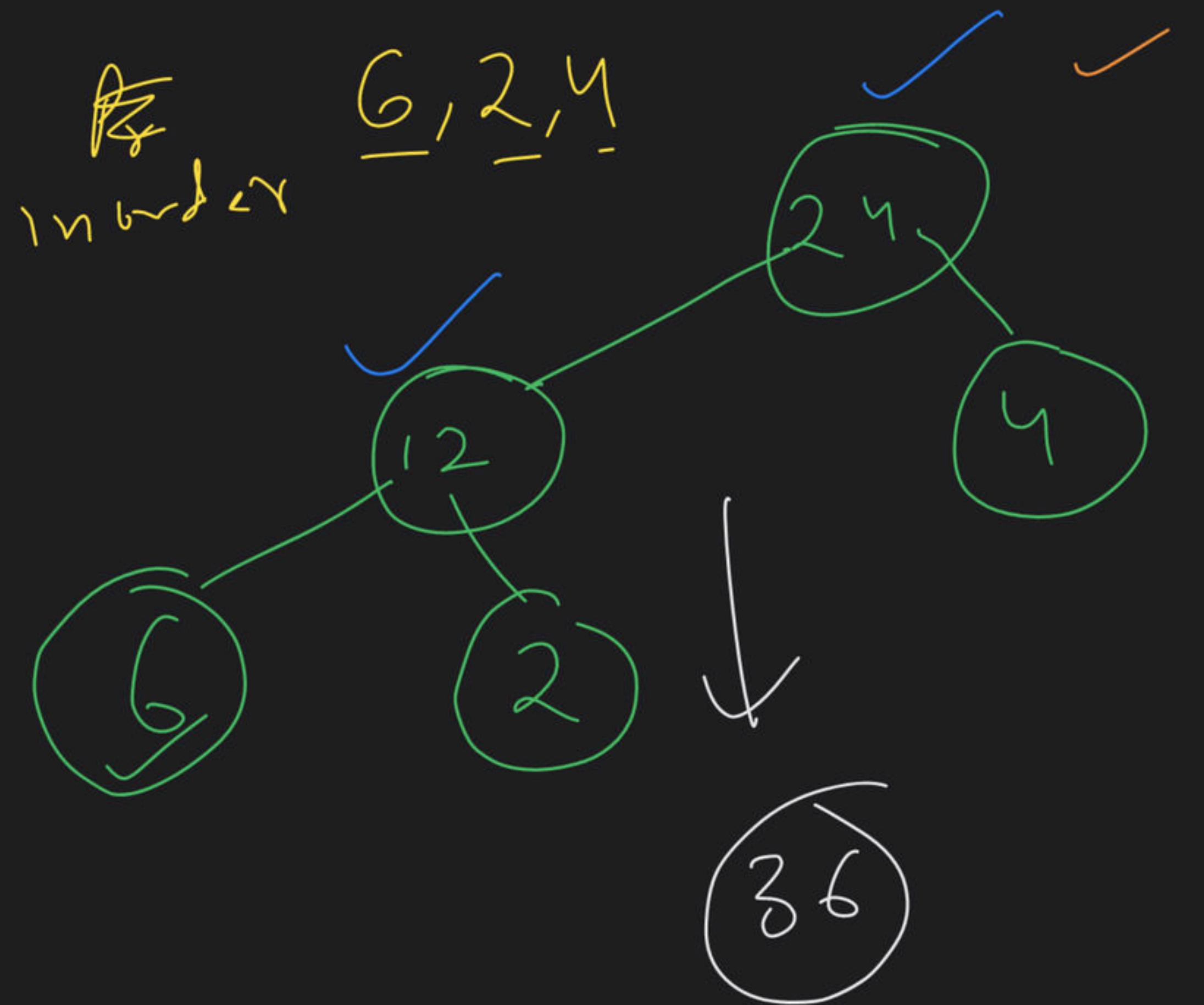


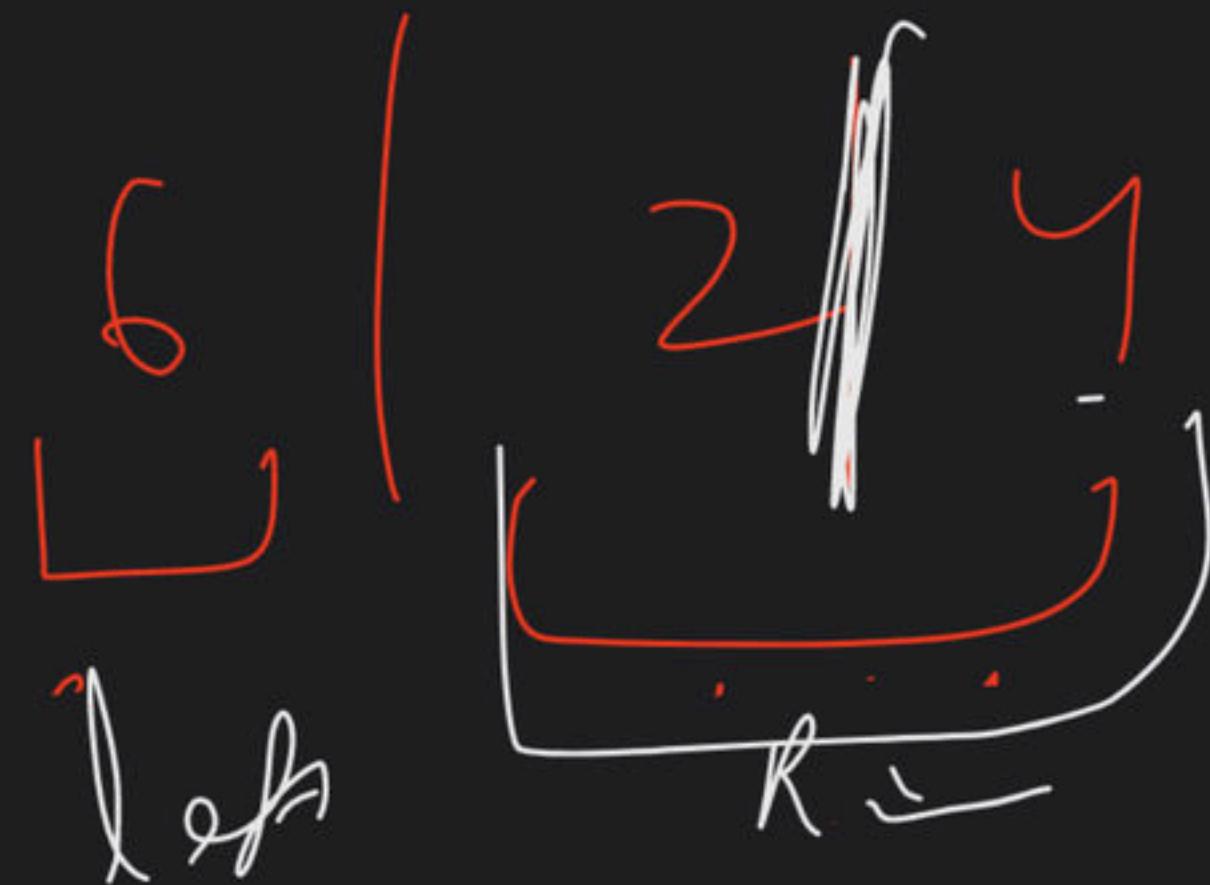
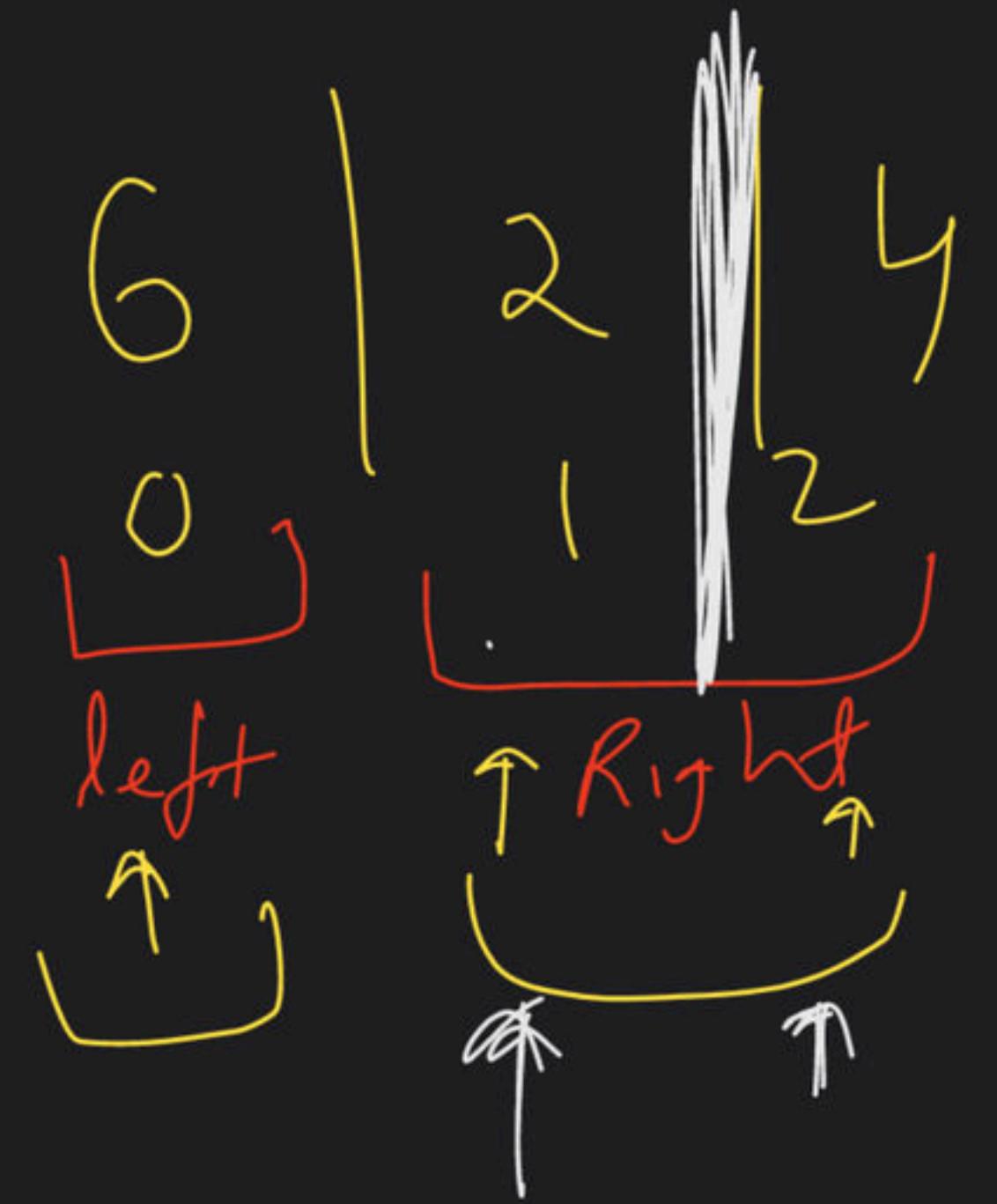
$l, n \rightarrow 0$

$l - 3 \rightarrow 5$









$$6 \times 4 + 2 \times 4 \\ 24 + 8 = \cancel{32}$$

$$6 \times 4 + 2 \times 4 \\ 32 - 8 = \\ 2 \times 4$$

for ($\underline{l} = s ; l < e ; i++$)

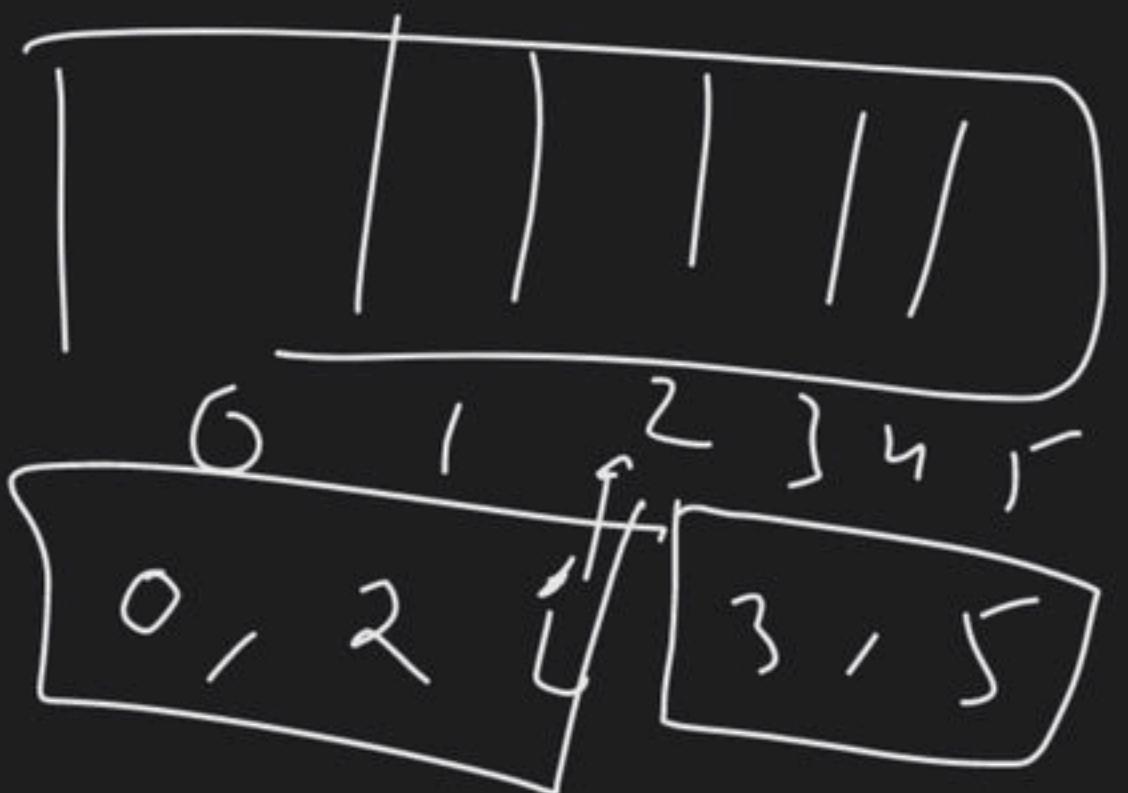
<

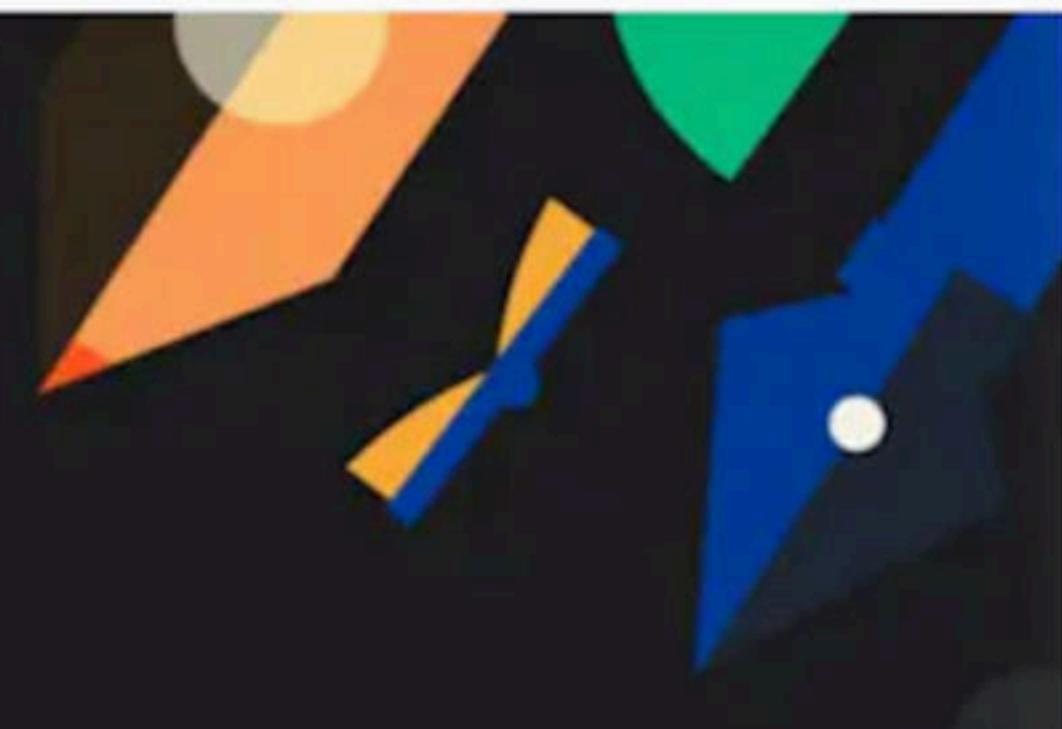
$$\text{ans} = \min \left(\text{ans}, \max_{l \in [s, i]} * \max_{l+1 \in [i+1, e]} \right)$$

+ RE(s, l)

+ RE(i+1, e)

3



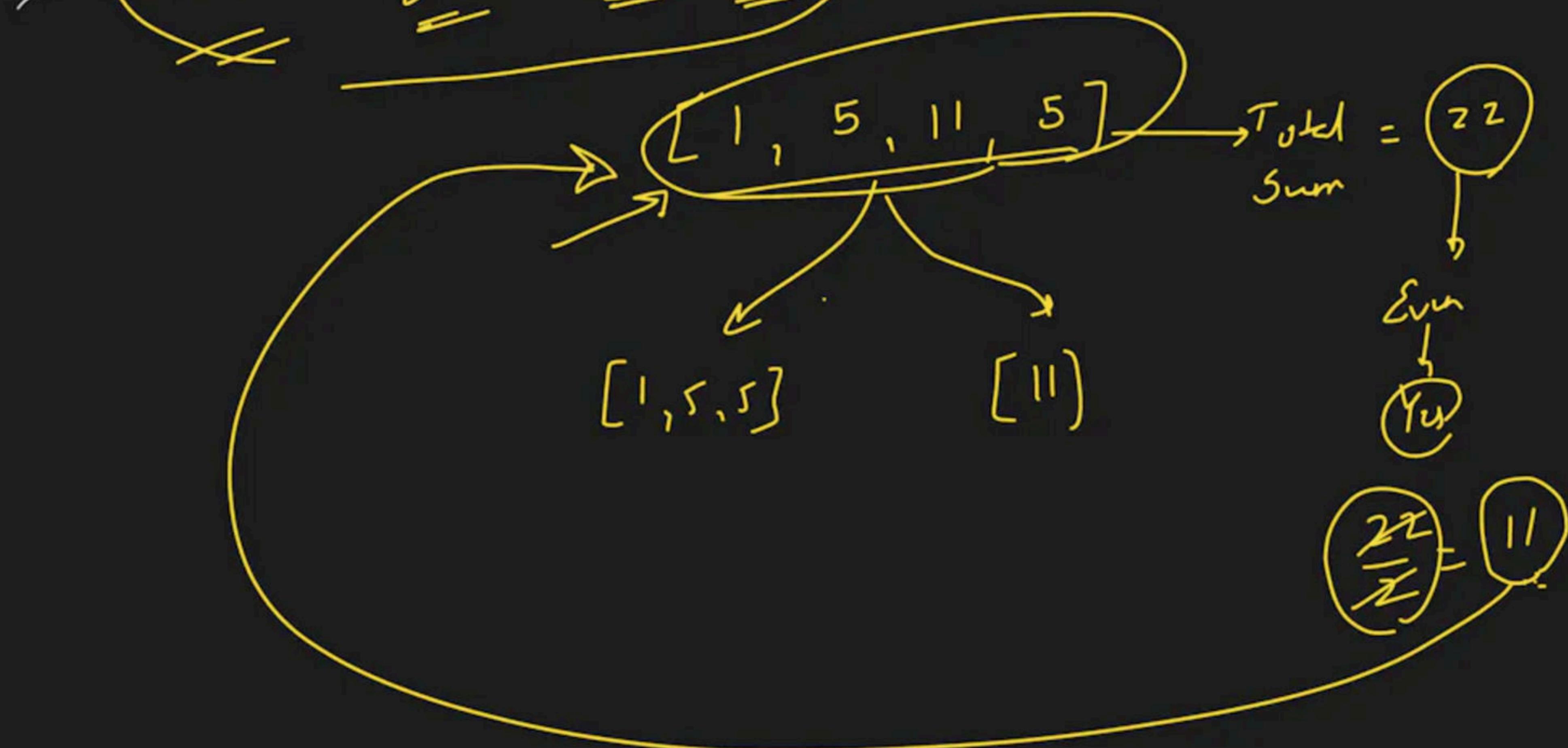


Dynamic Programming Class-7

Special class

Love Babbar • Jan 19, 2024

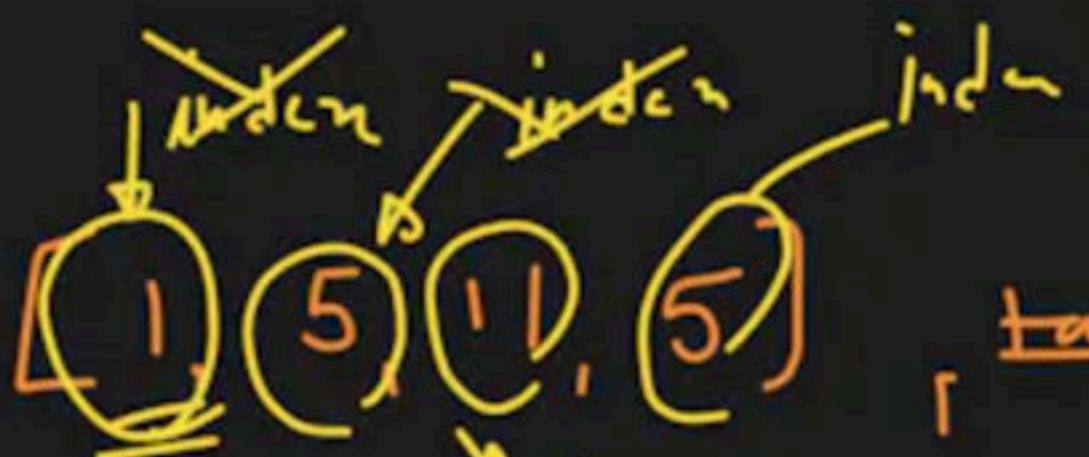
~~Partition or Equal Subsets Sum~~



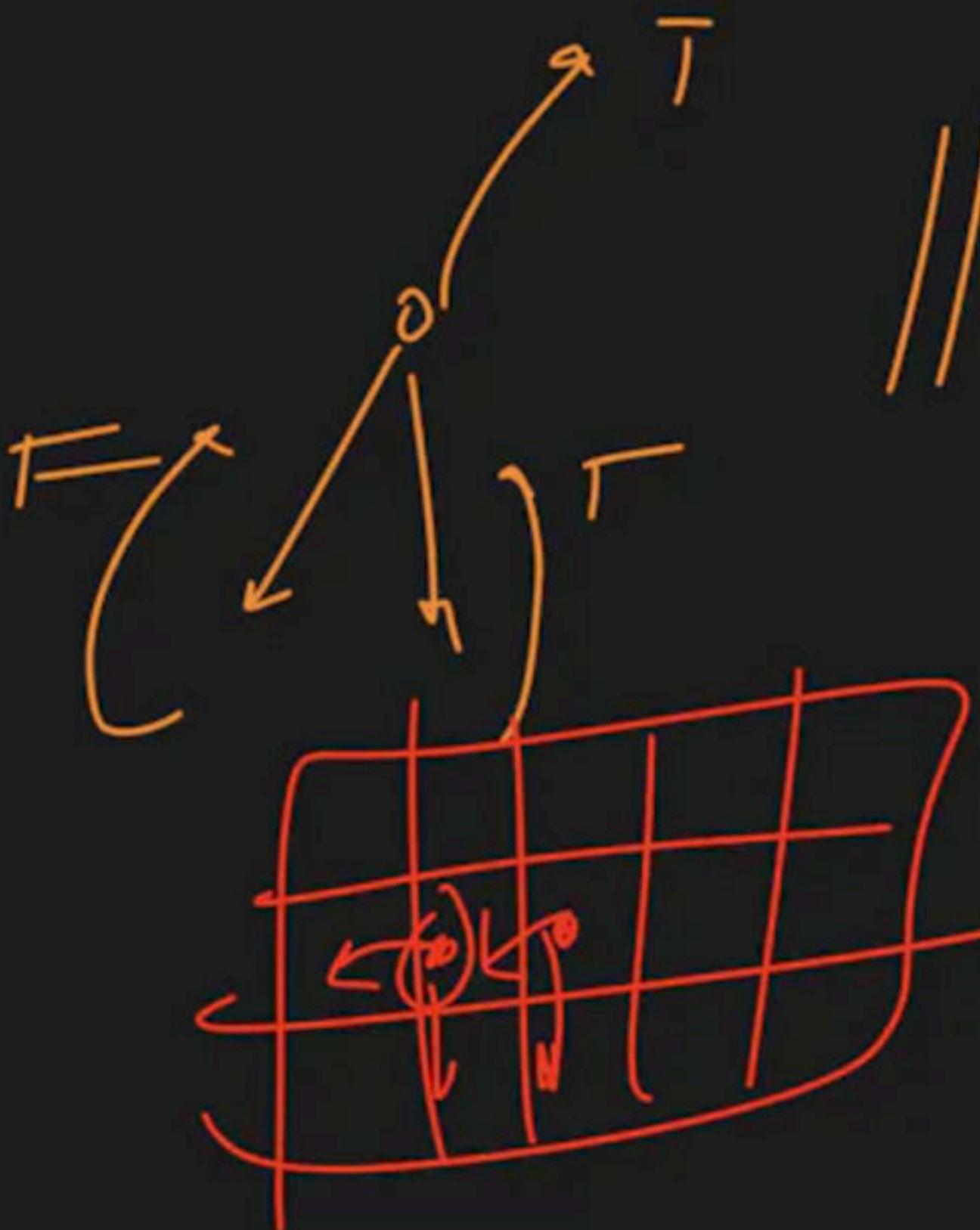
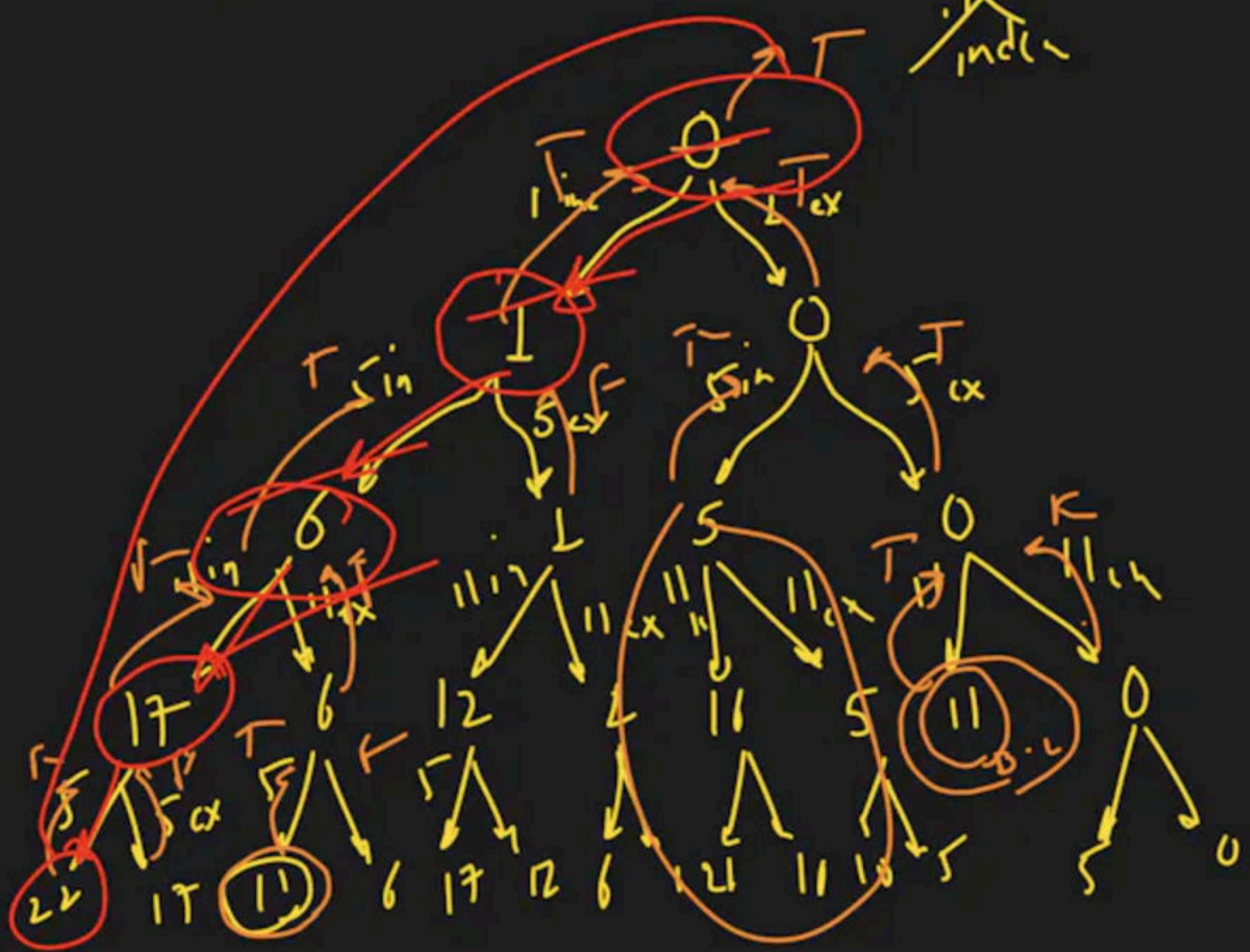
[1, 5, 9, 11, 5]

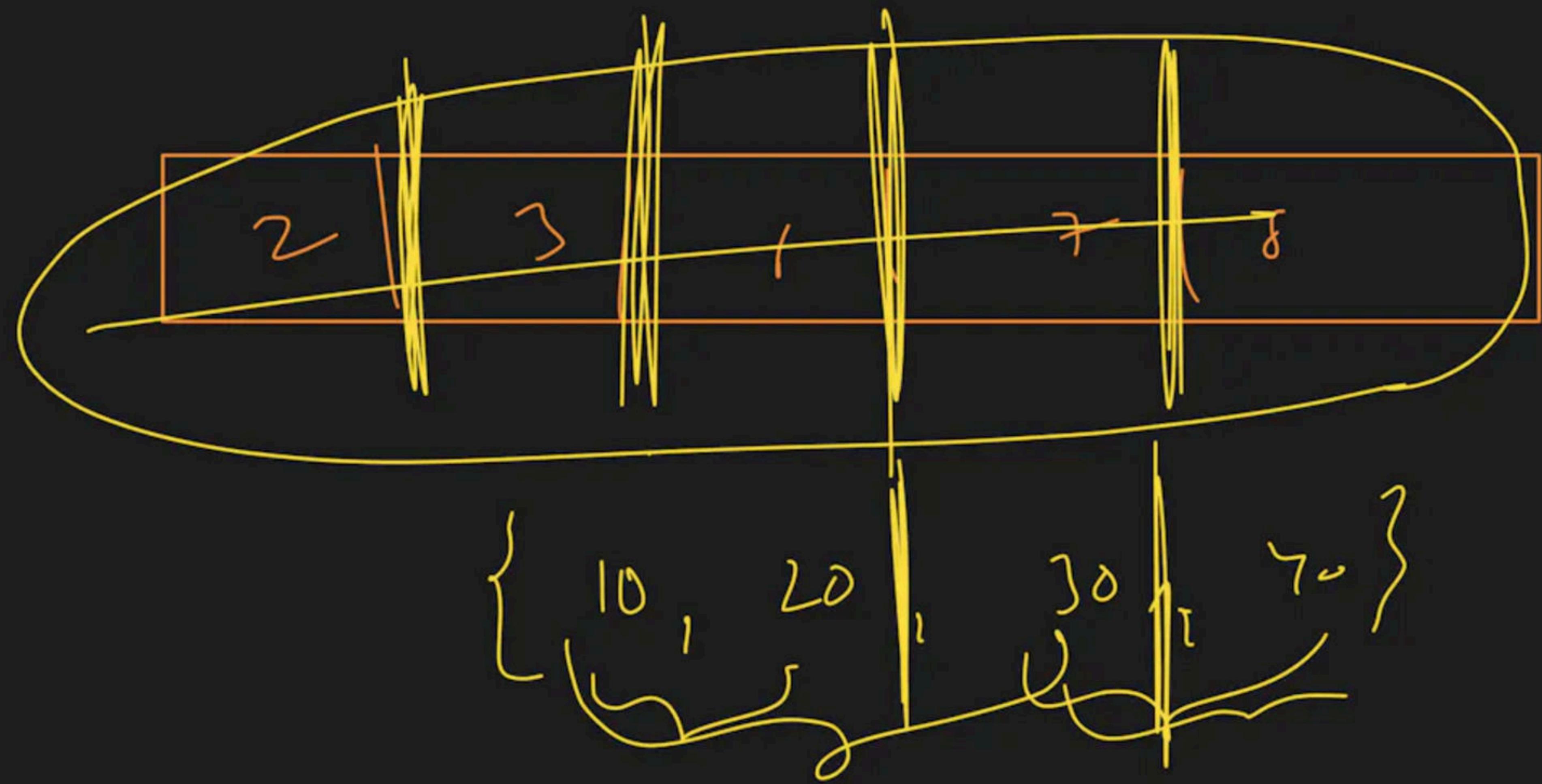
f(1)

mar



target = 11





YLL

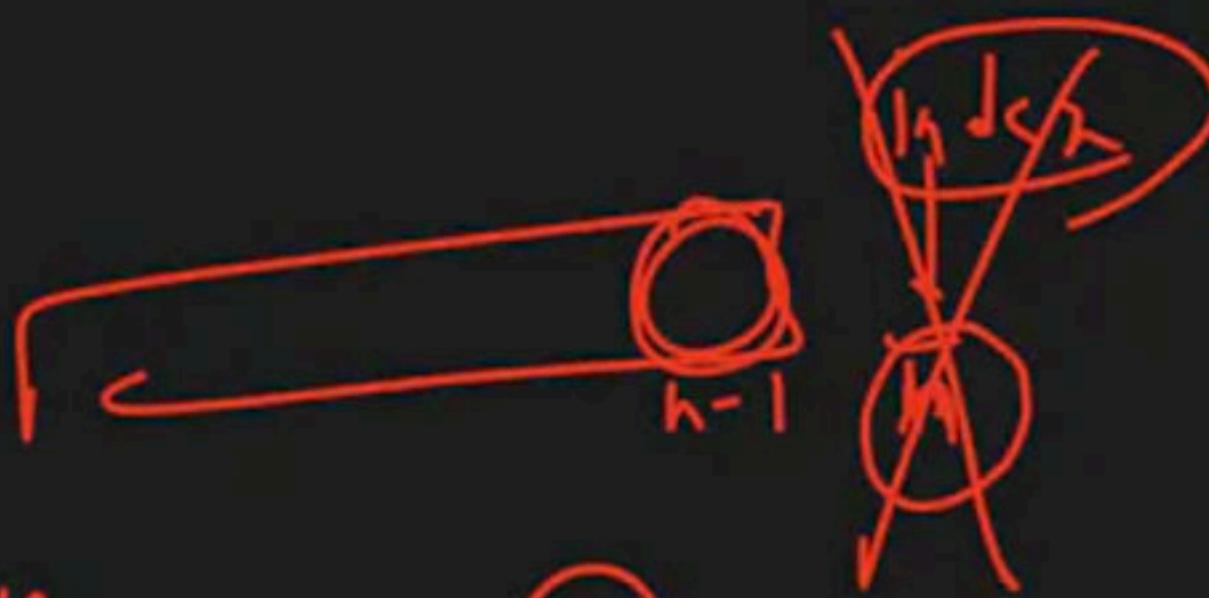
Index $\rightarrow 0 \rightarrow n$

Ind = n

(n-1)

Lab

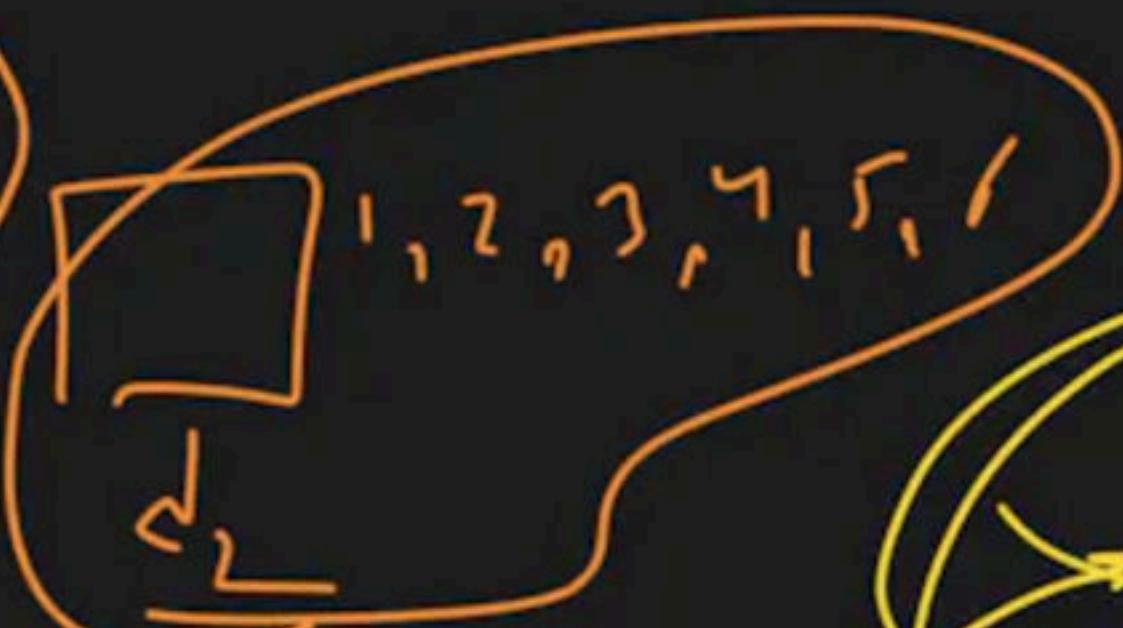
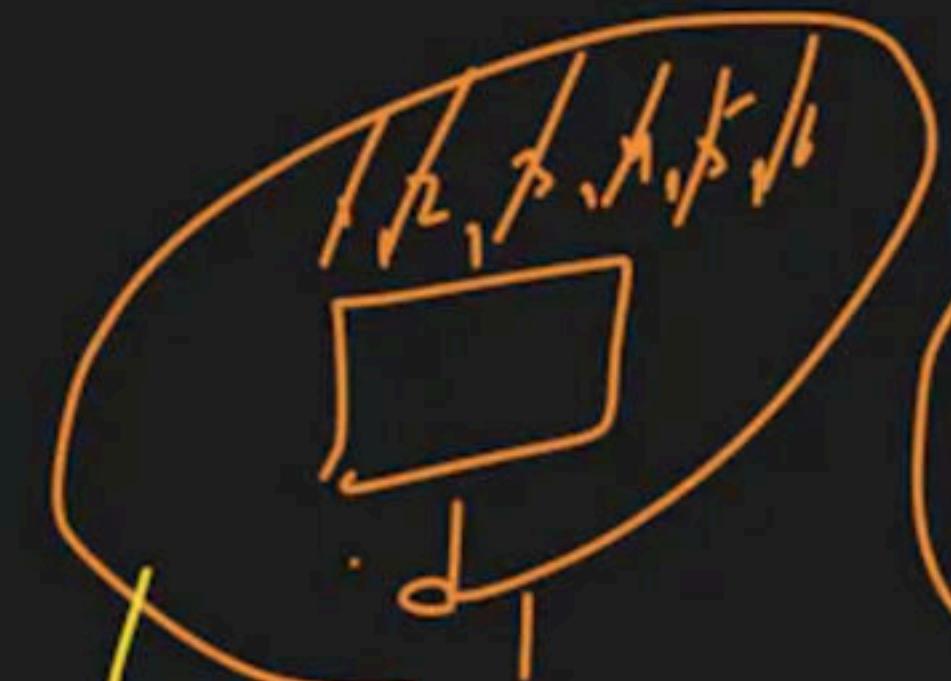
i_{n-1} = b → P → Q



$\Rightarrow n = 2$

, $K = 6$

target = 7

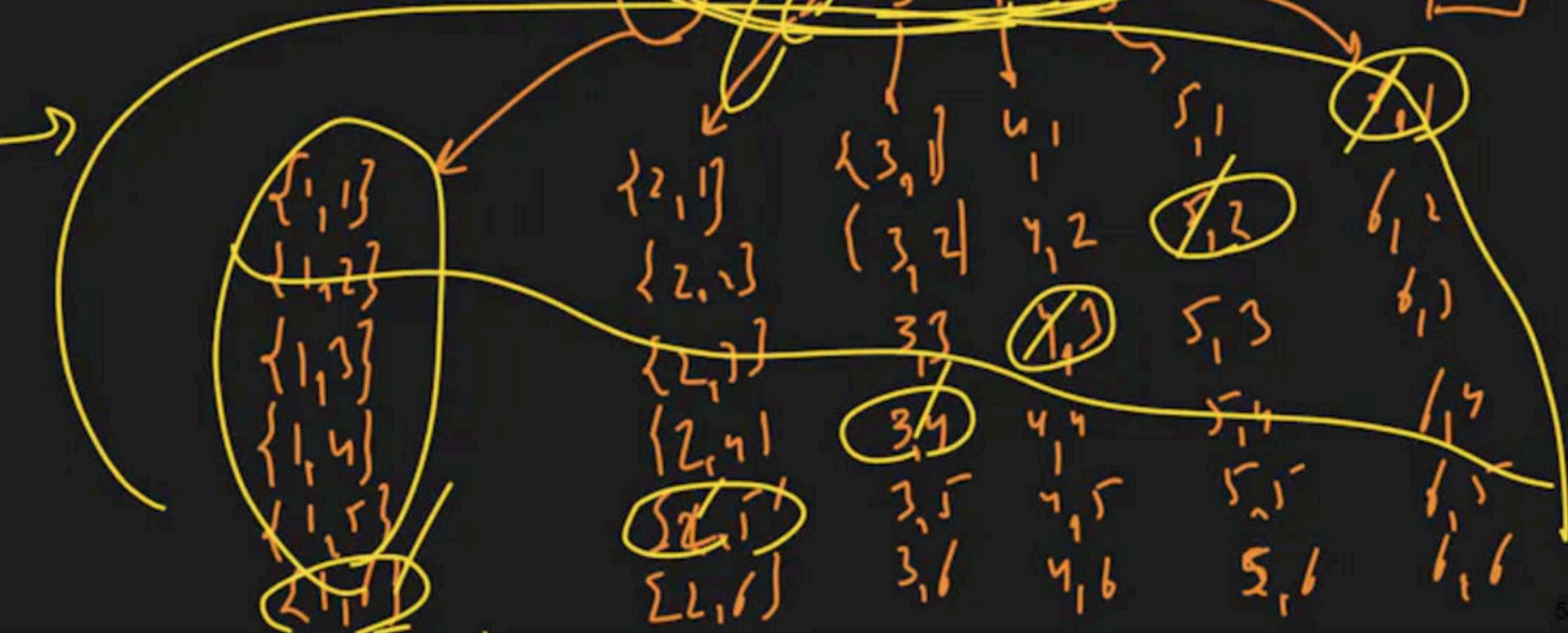


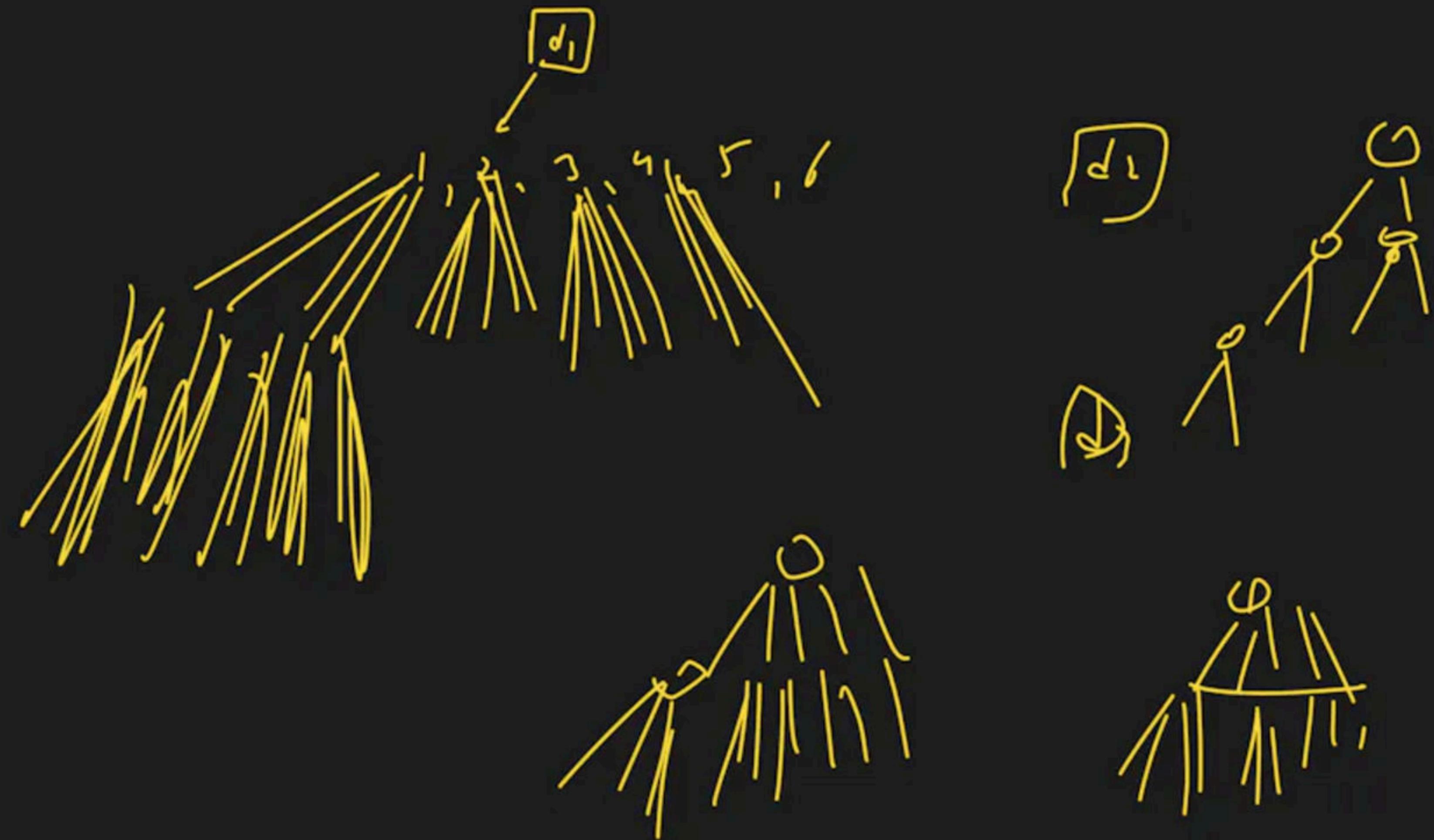
(7)

6915



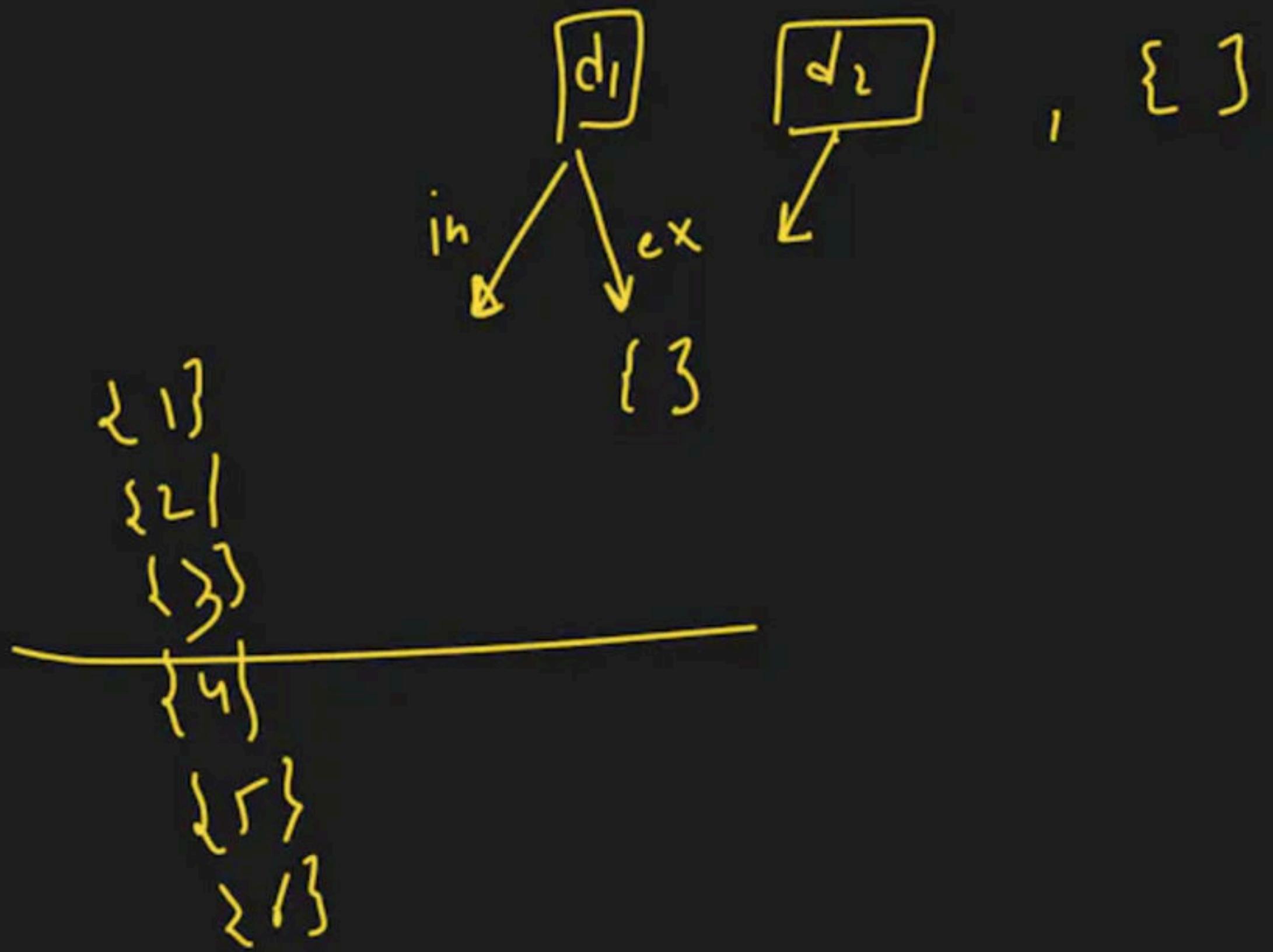
d_1

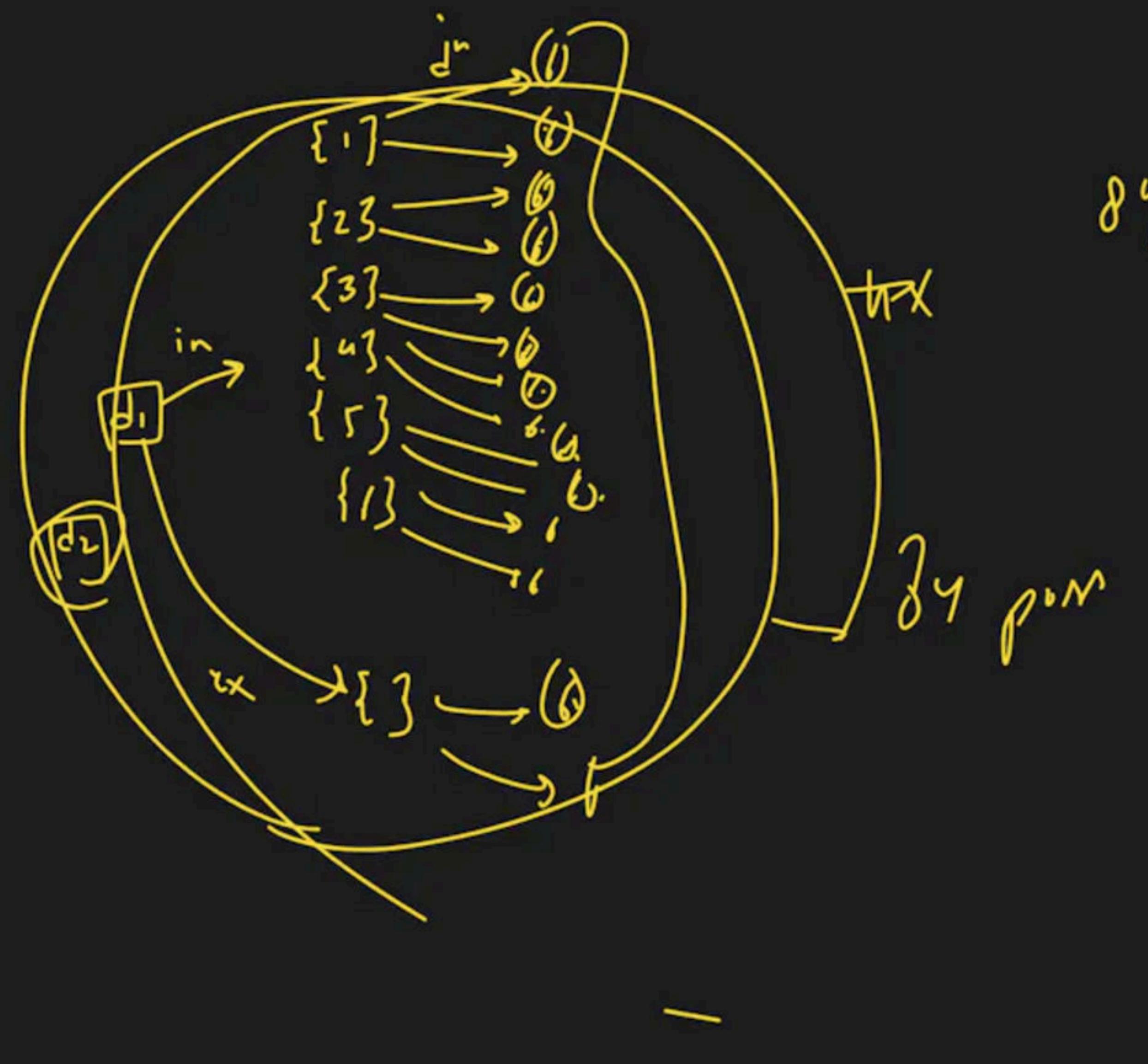




~~ind / exd~~

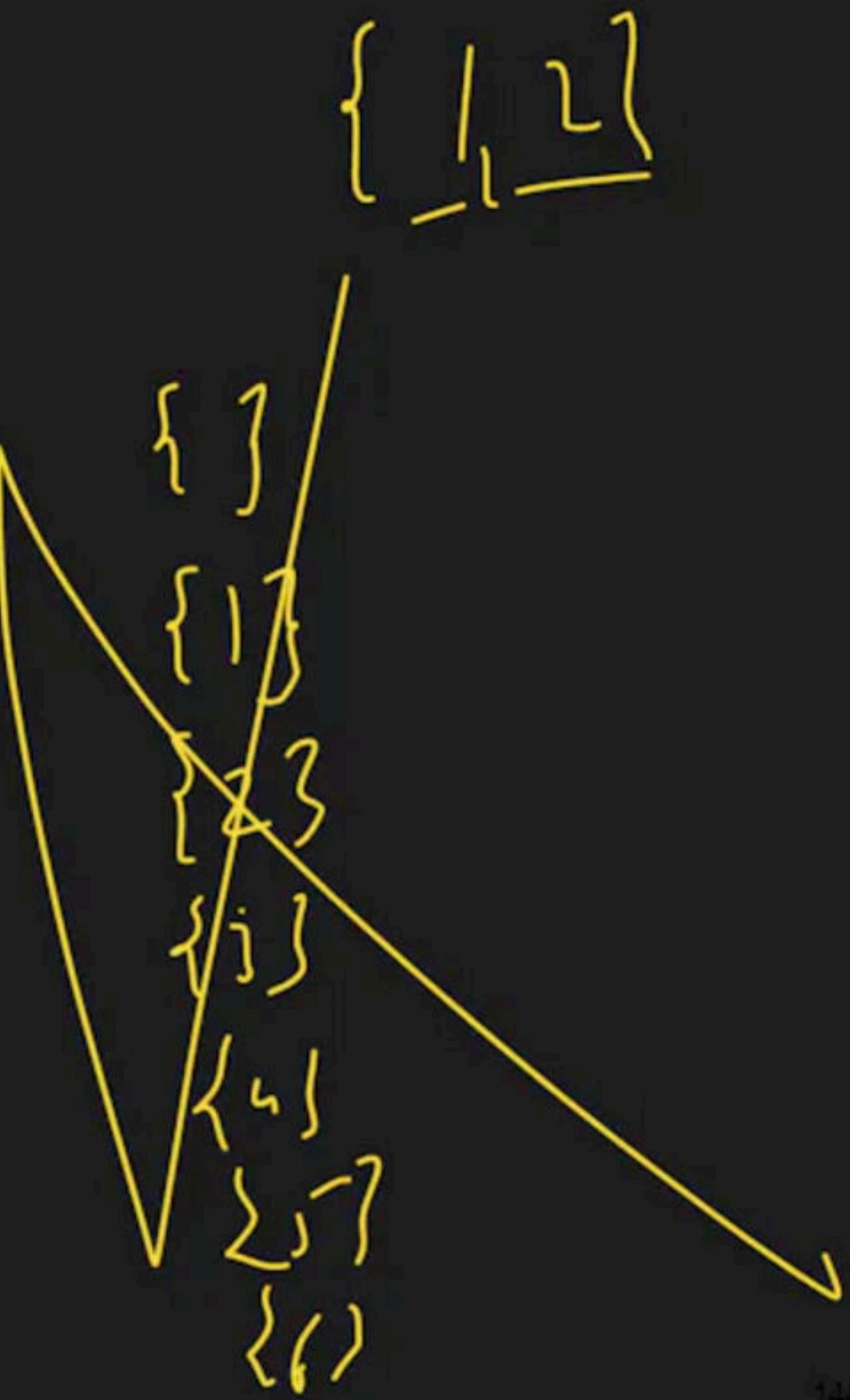
all
possible
ways





89

84 ρ_{in}



coin change

Explore all ways

for ()
{ }

ans +=



if { 1, 3, 5 }

10

X

explore all possible
ways to create target

X

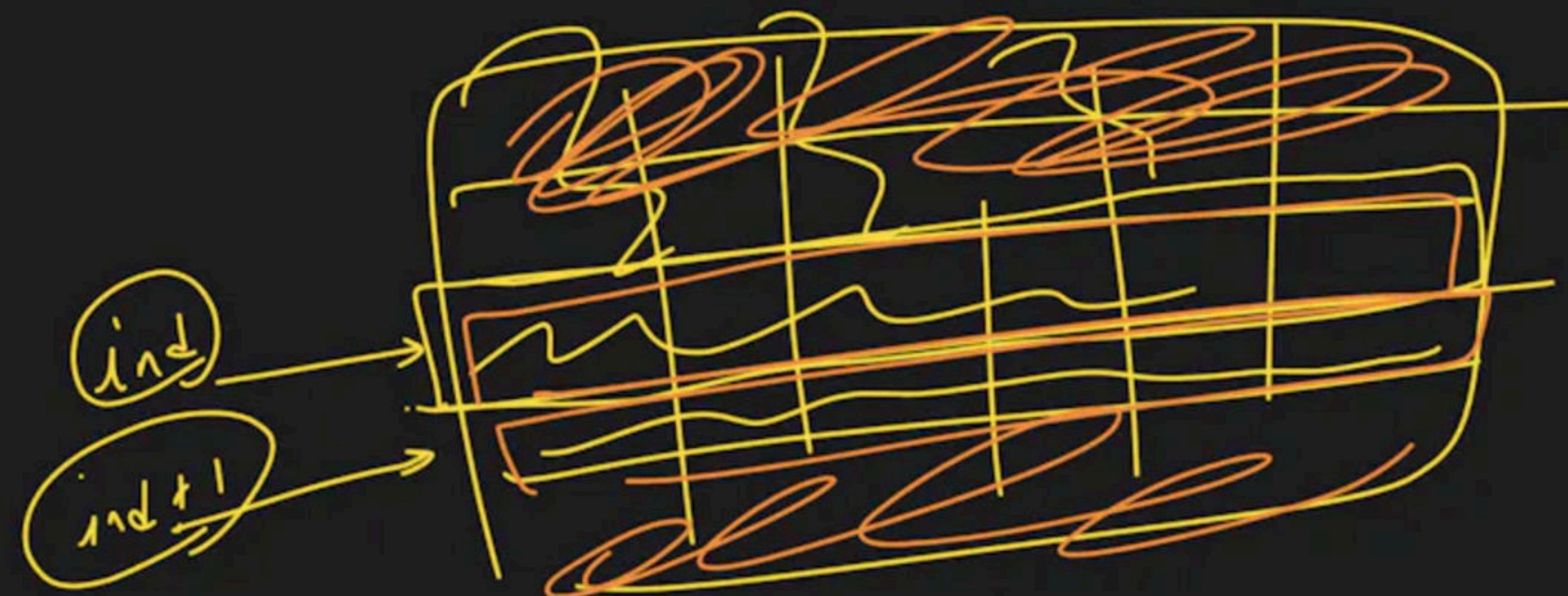
return min no of "1's"
to create target



$dp[i^{nd}][s]$

$dp[i^{nd+1}][s]$

$dp[i^{nd+1}] [s + \text{ans}(i^{nd})]$



\Rightarrow UnBounded = Knapsack

$N = 2$

$N = 3$

Val [1 , 1]

wf [2 , 1]