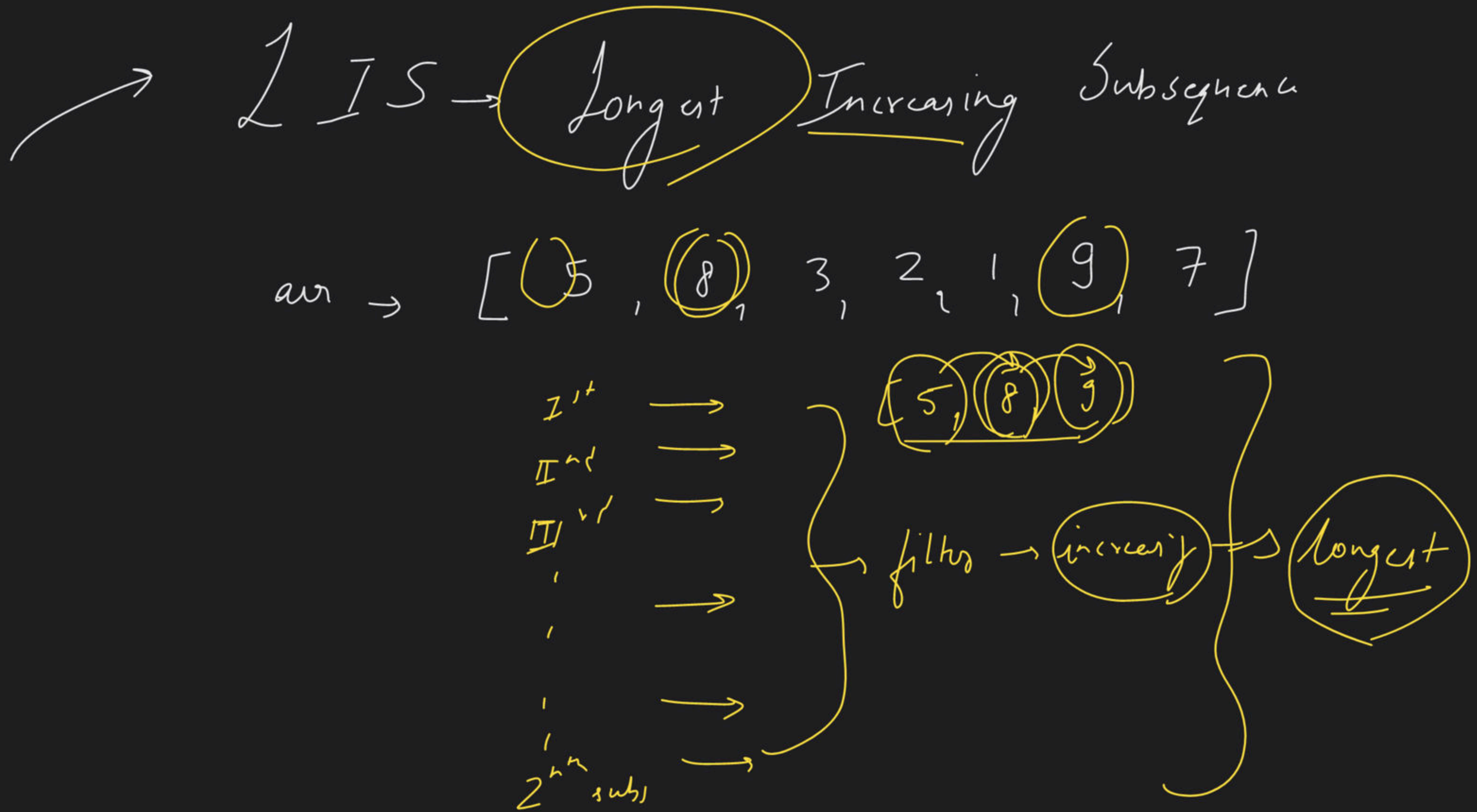
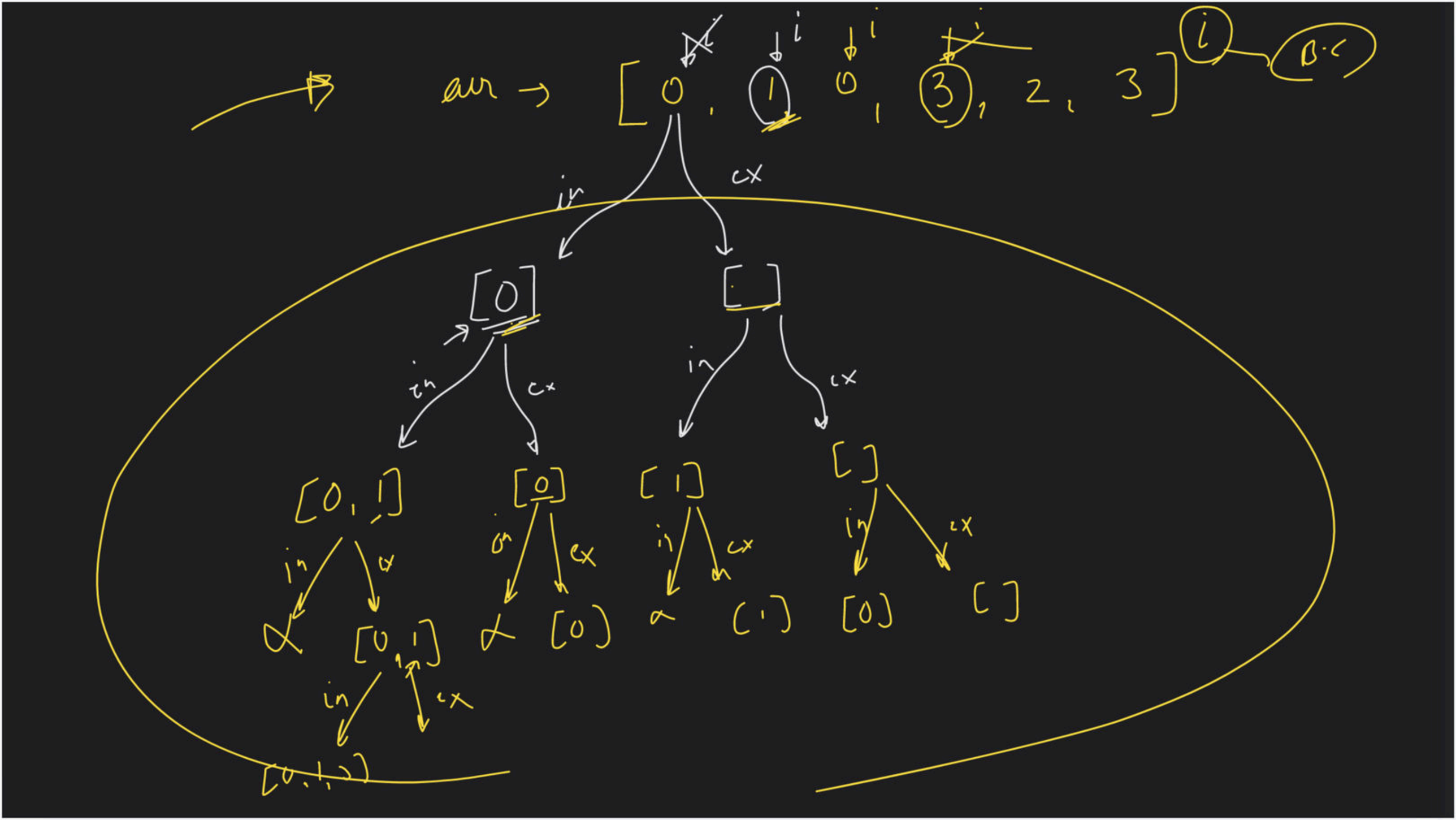
Dynamic Programming Class - 7 [JOIN HERE]

Special class

Love Babbar • June 16, 2023


LIS → Longest Increasing Subsequence
arr → [5, 8, 3, 2, 1, 9, 7]
1st
2nd
3rd
2^n subs
5, 8, 9
filter → increasing
longest

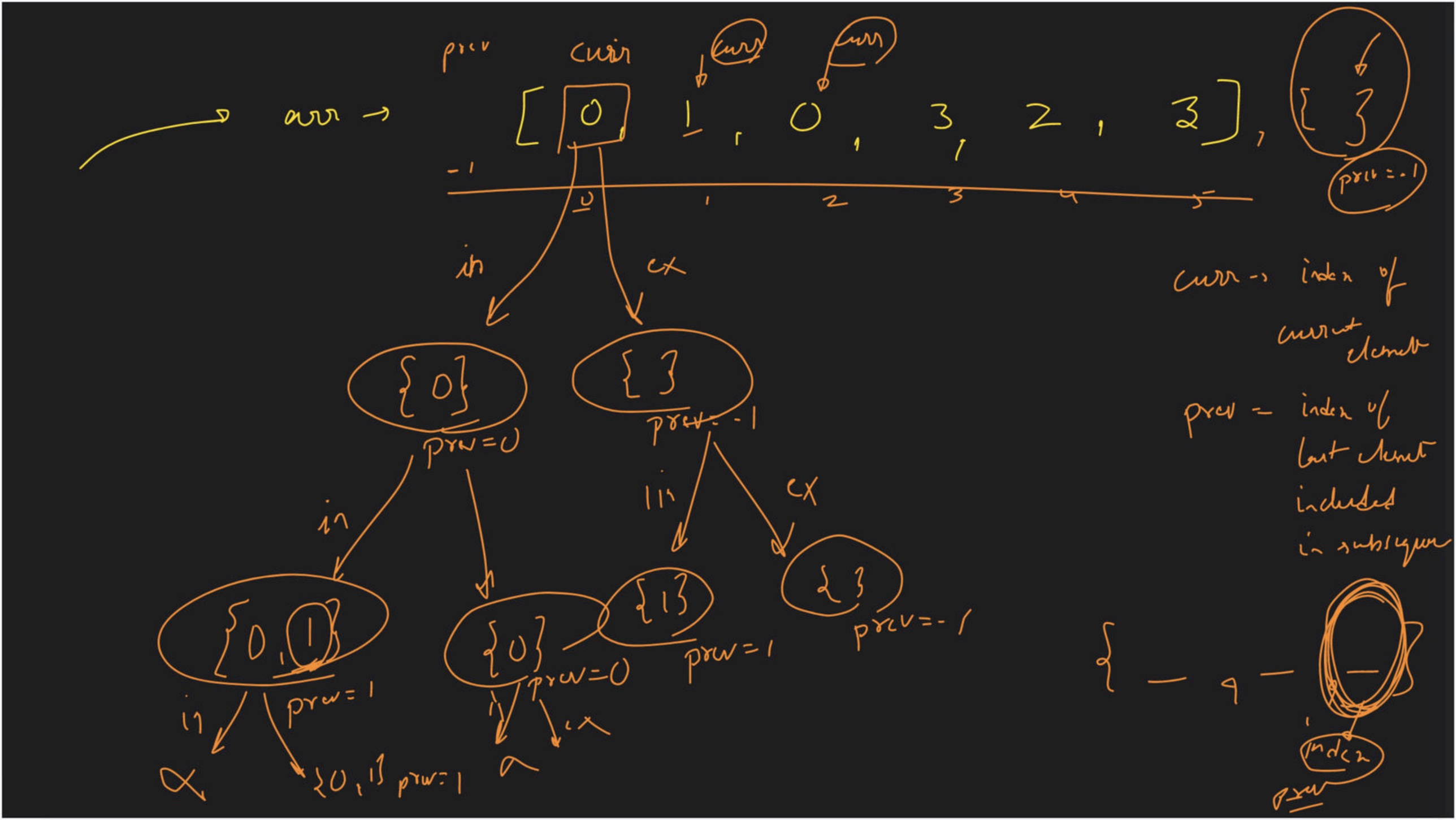

arr →
[0, 1, 0, 3, 2, 3]
i
0..c
in
cx
[0]
[]
[0,1]
[0]
[1]
[]
[0,1]
[0]
[]
[0,1,2]

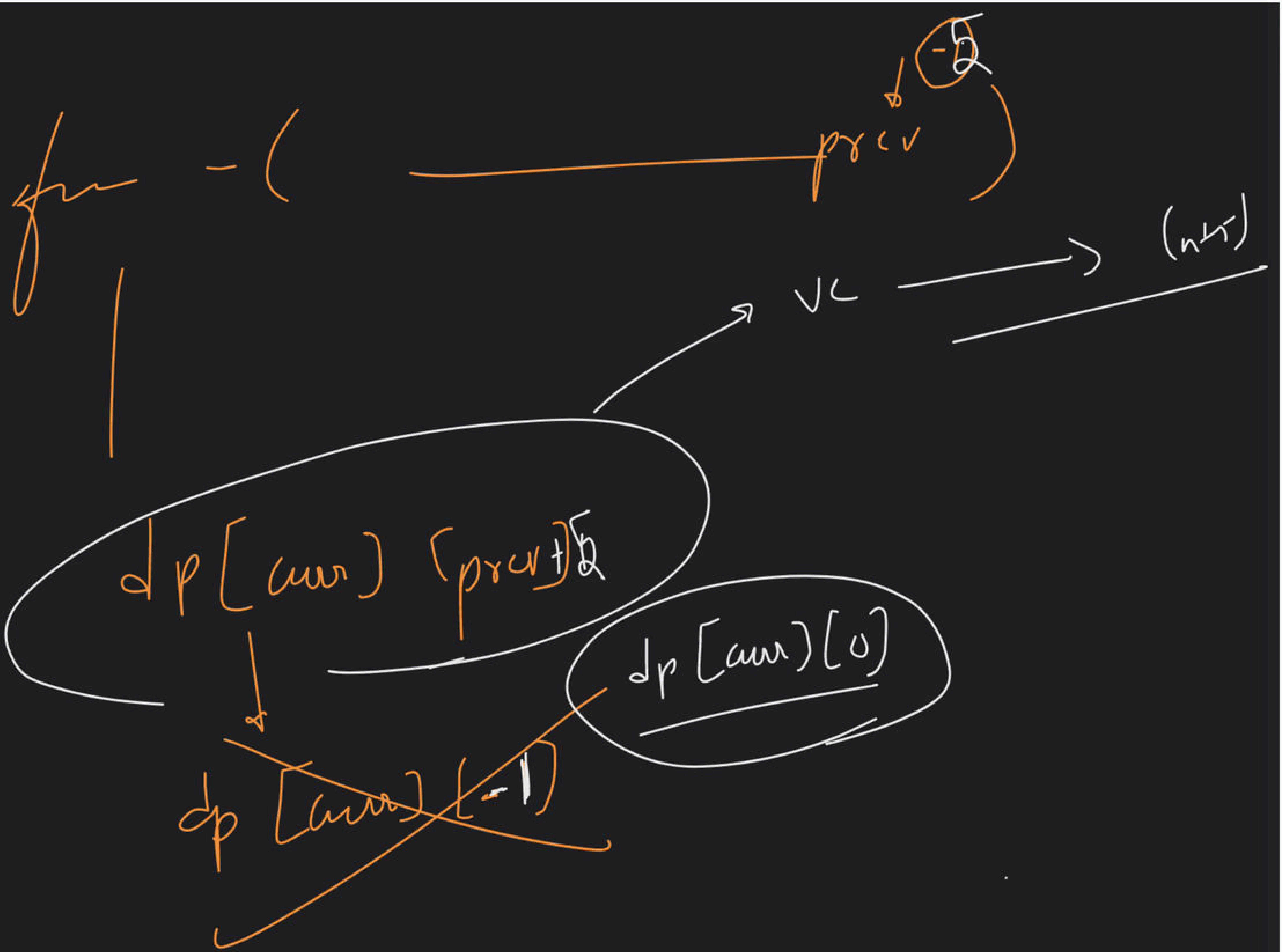
R. R

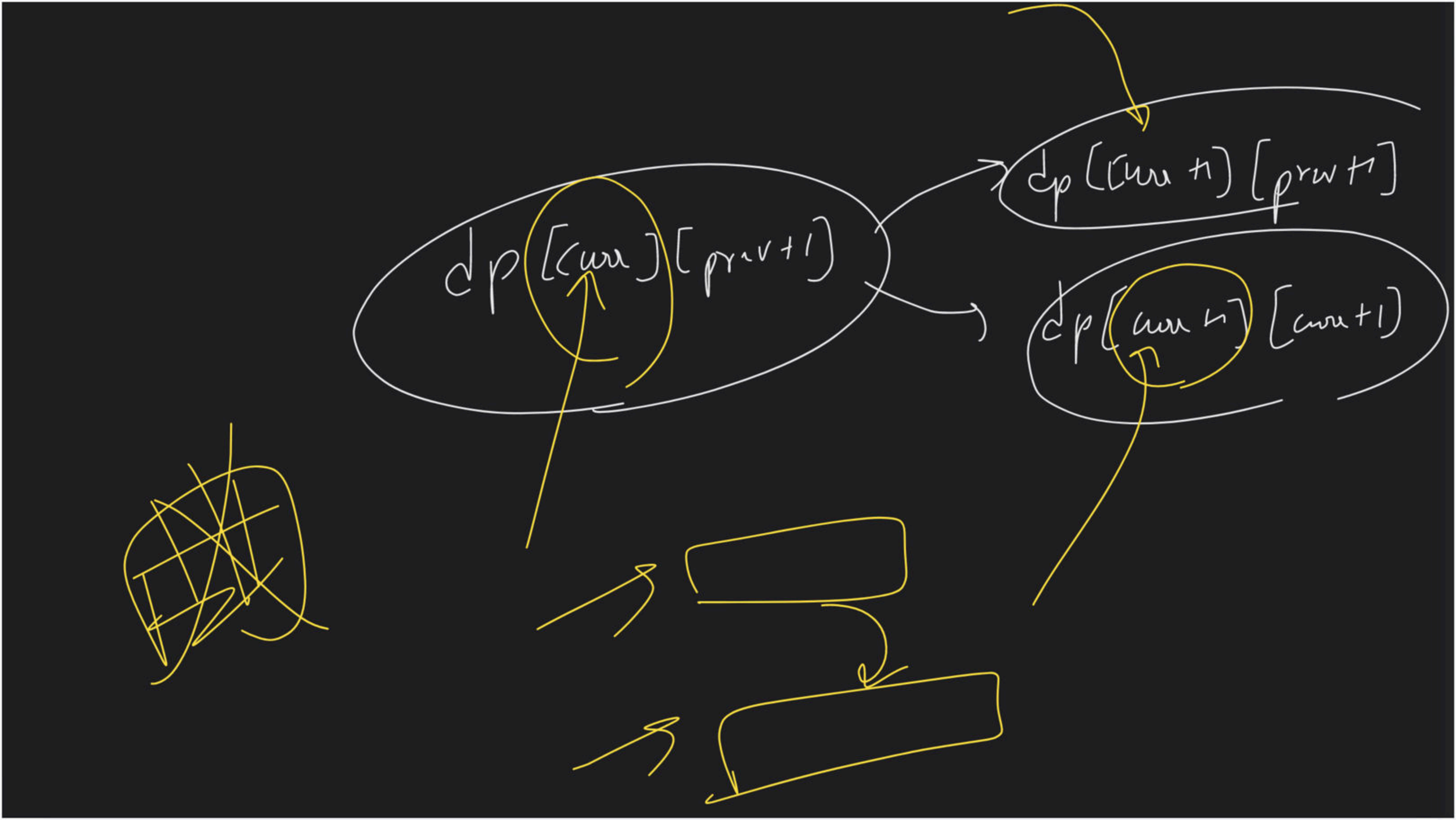
take →

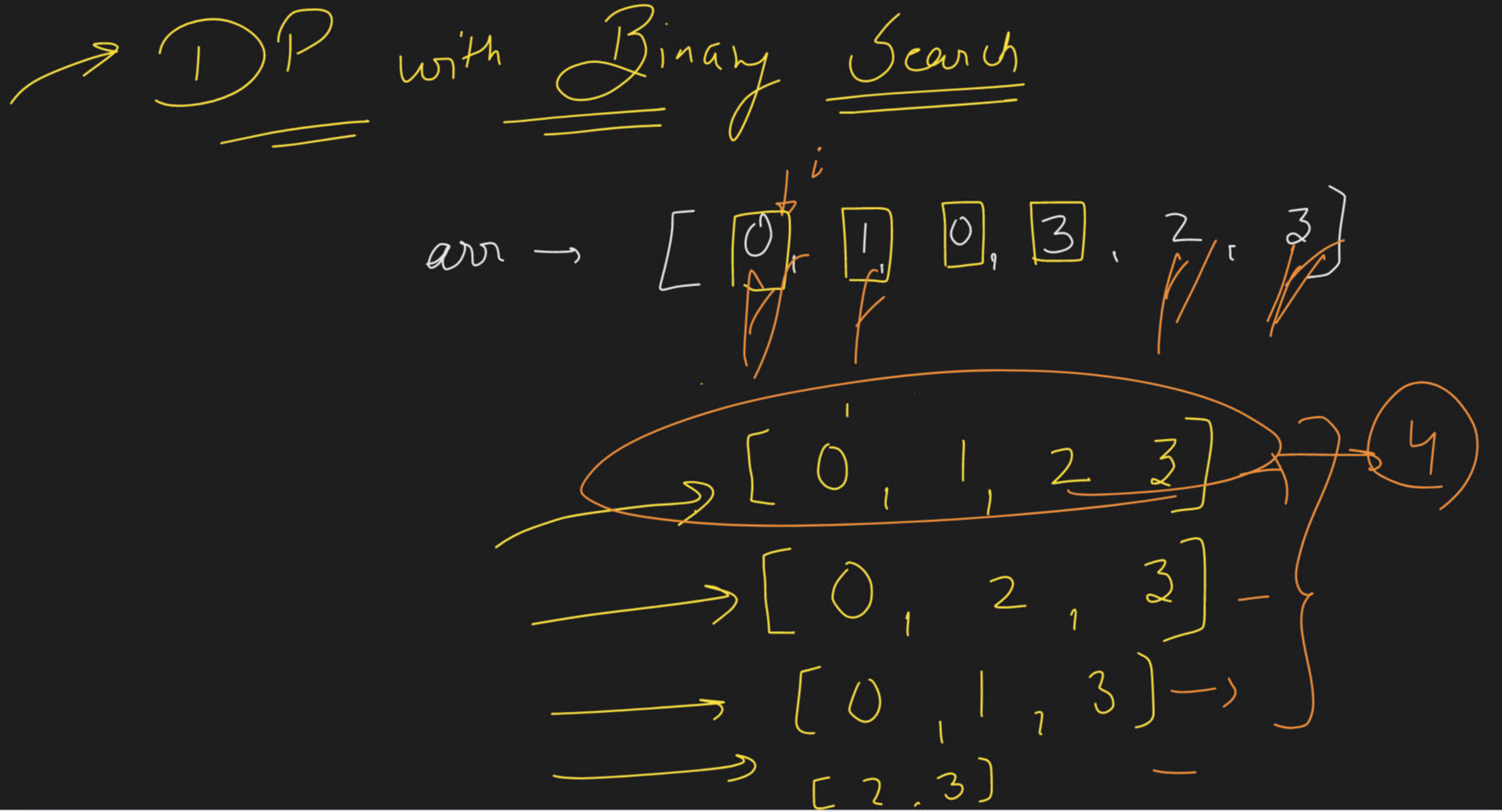
notTake →

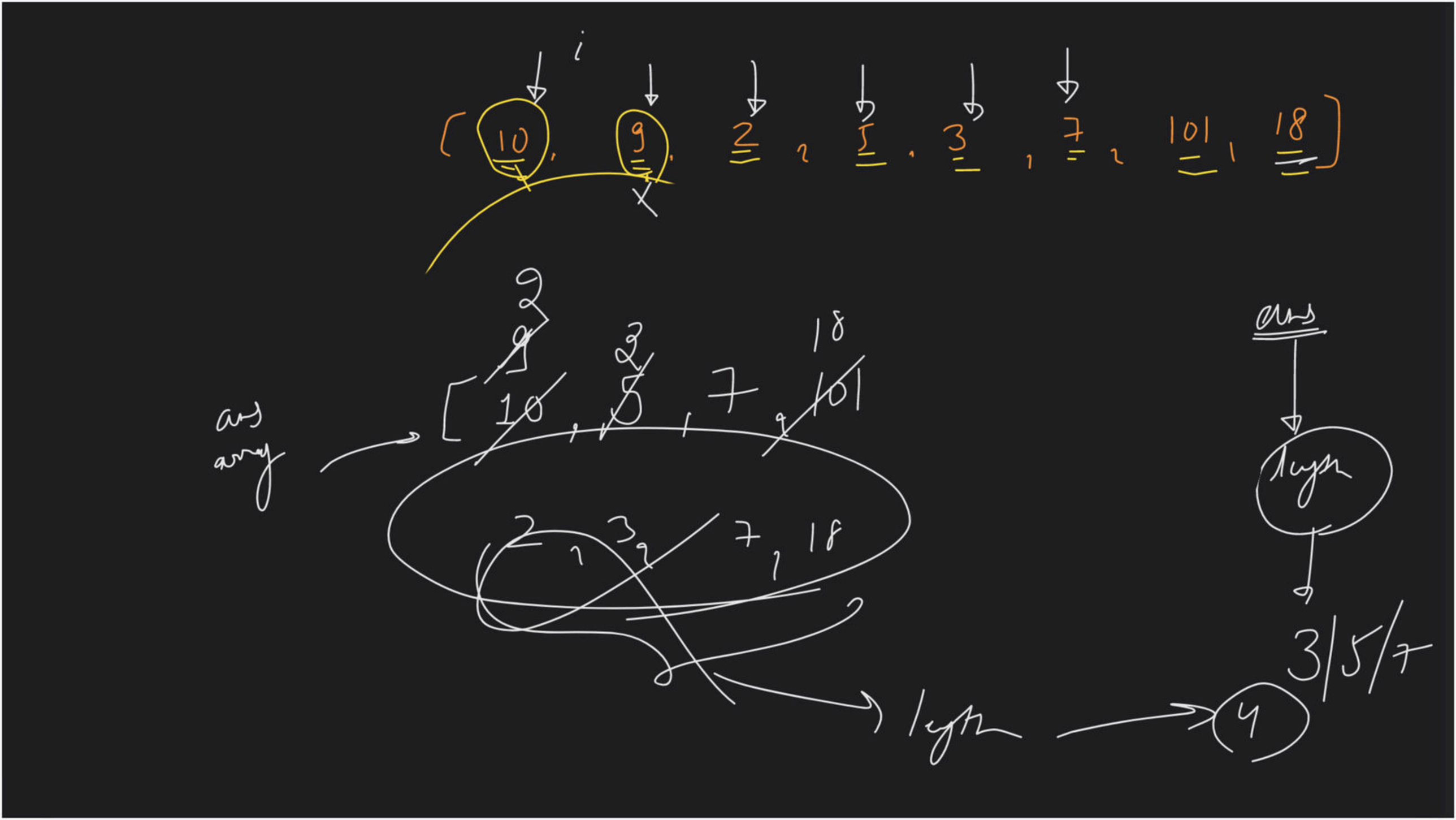
return max(take, notTake)

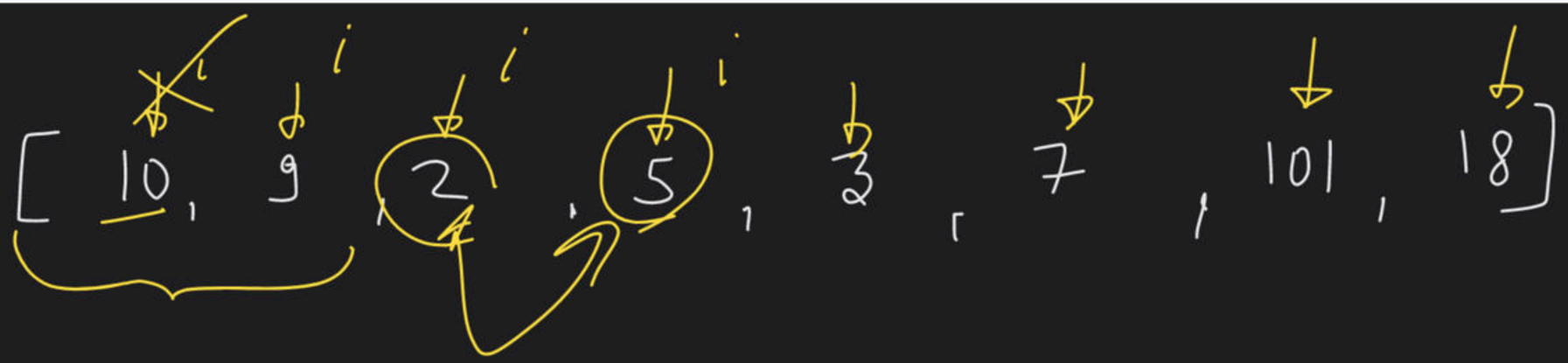

prev
curr
curr
curr
arr →
[0 1 , 0 , 3 , 2 , 3]
-1
0
1
2
3
4
5
{ 3 }
prev = -1
in
ex
{ 0 }
prev = 0
{ 3 }
prev = -1
in
ex
{ 0 , 1 }
prev = 1
{ 0 }
{ 1 3 }
prev = 0
prev = 1
{ 3 }
prev = -1
in
ex
{ 0 , 1 }
prev = 1
curr -> index of current element
prev = index of last element included in subsequence
{ — q — —
index
prev


prev
-2
VC
dp[curr][prev+2]
dp[curr][0]
dp[curr][-1]


dp[curr][prev+1]
dp[curr+1][prev+1]
dp[curr+1][curr+1]


DP with Binary Search
arr → [0, 1, 0, 3, 2, 3]
i
[0, 1, 2, 3]
4
[0, 2, 3]
[0, 1, 3]
[2, 3]


i
[10, 9, 2, 1, 3, 7, 101, 18]
ans array
[10, 9, 2, 1, 3, 7, 101, 18]
2, 3, 7, 18
len
ans
3/5/7
4



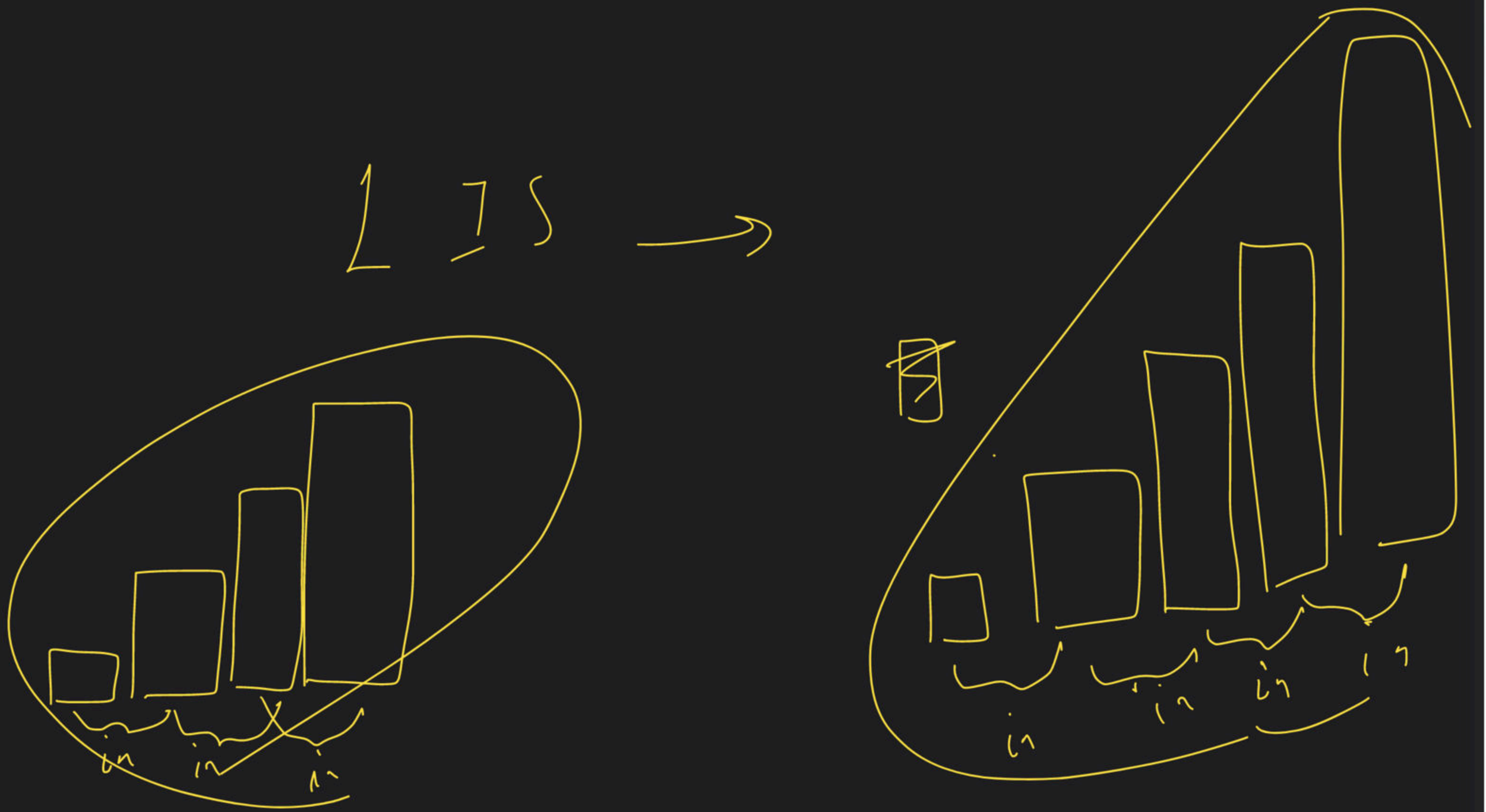
Purani

[10, 101
[9, , 101
[2, 5, 7, 101
[3 7, 101
[11

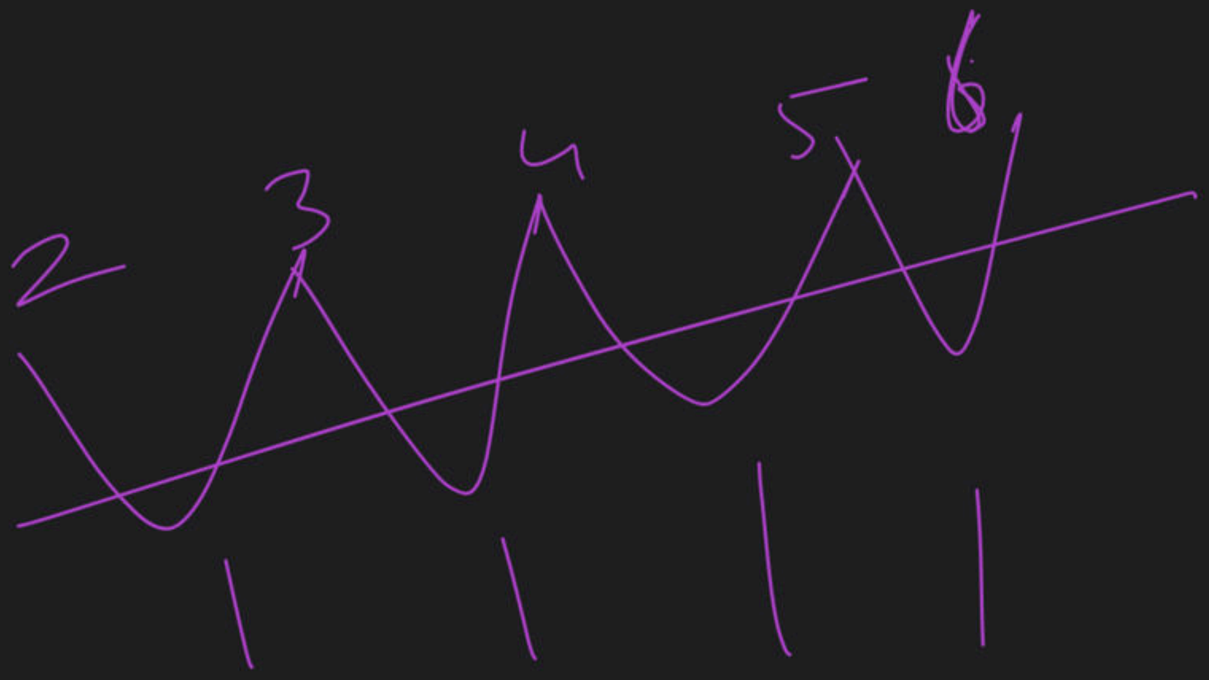
New

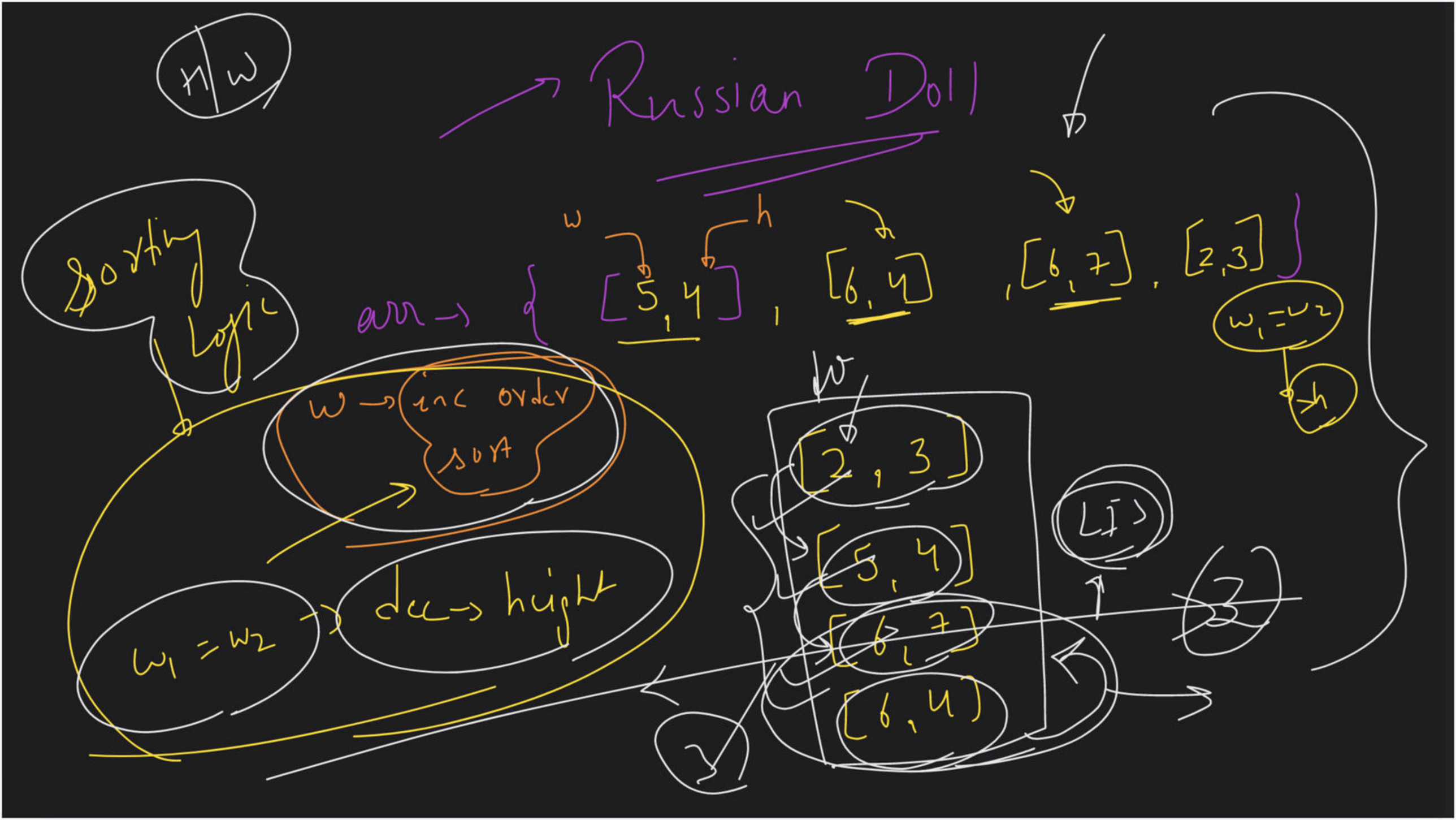
ans ⟹

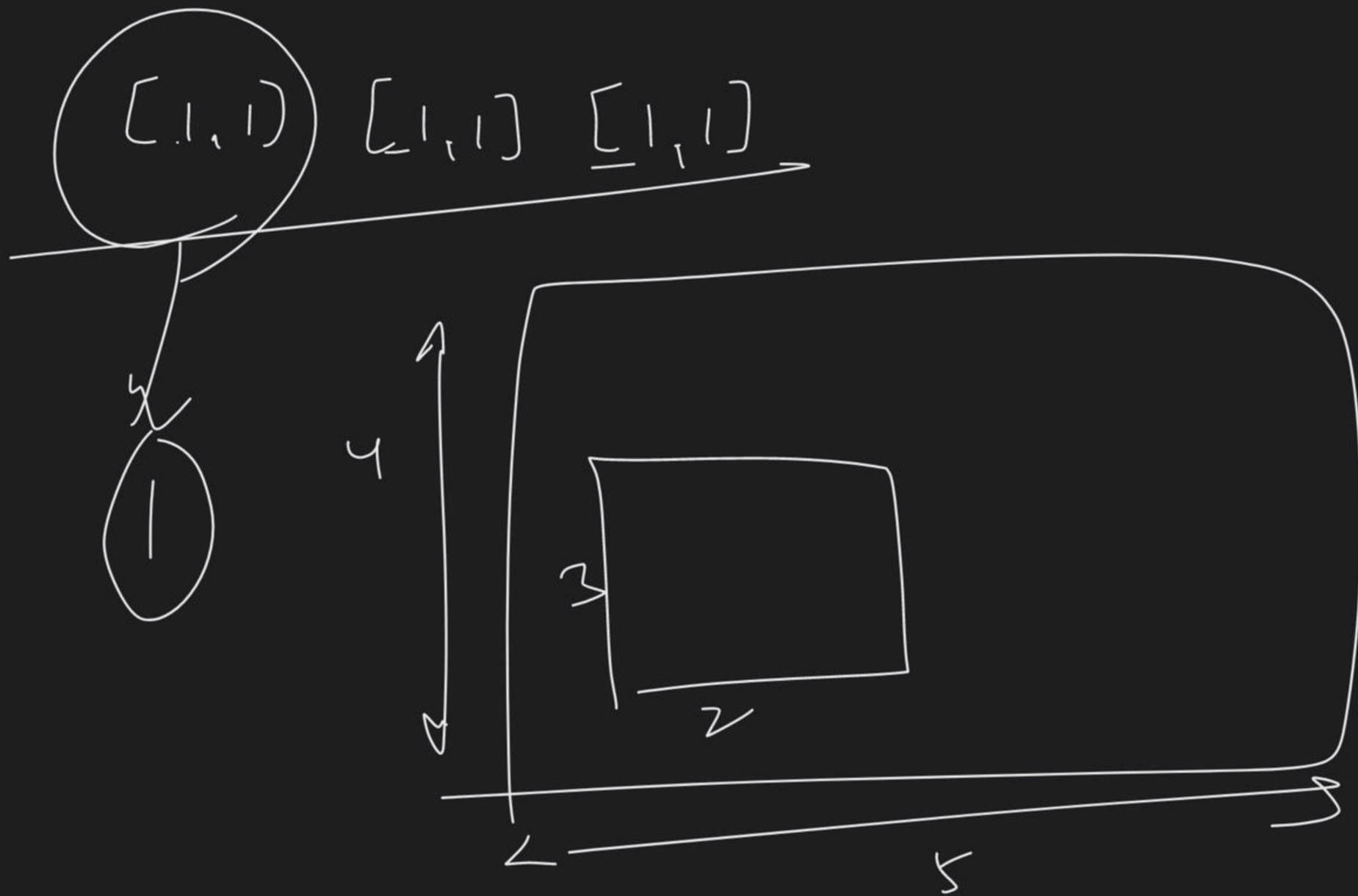
[10, 5, 7, 101
9 3 18
2 1
2, 3, 7, 11



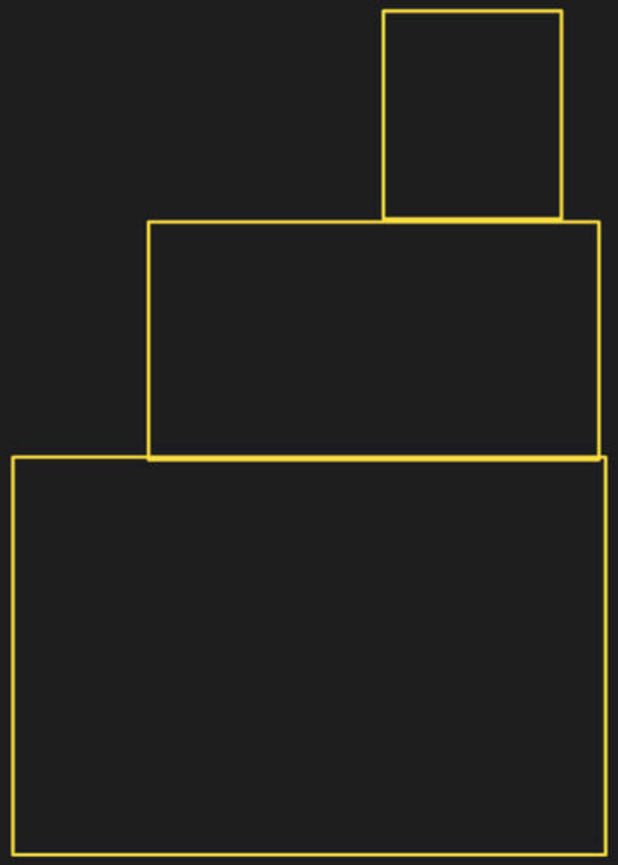

1000
123

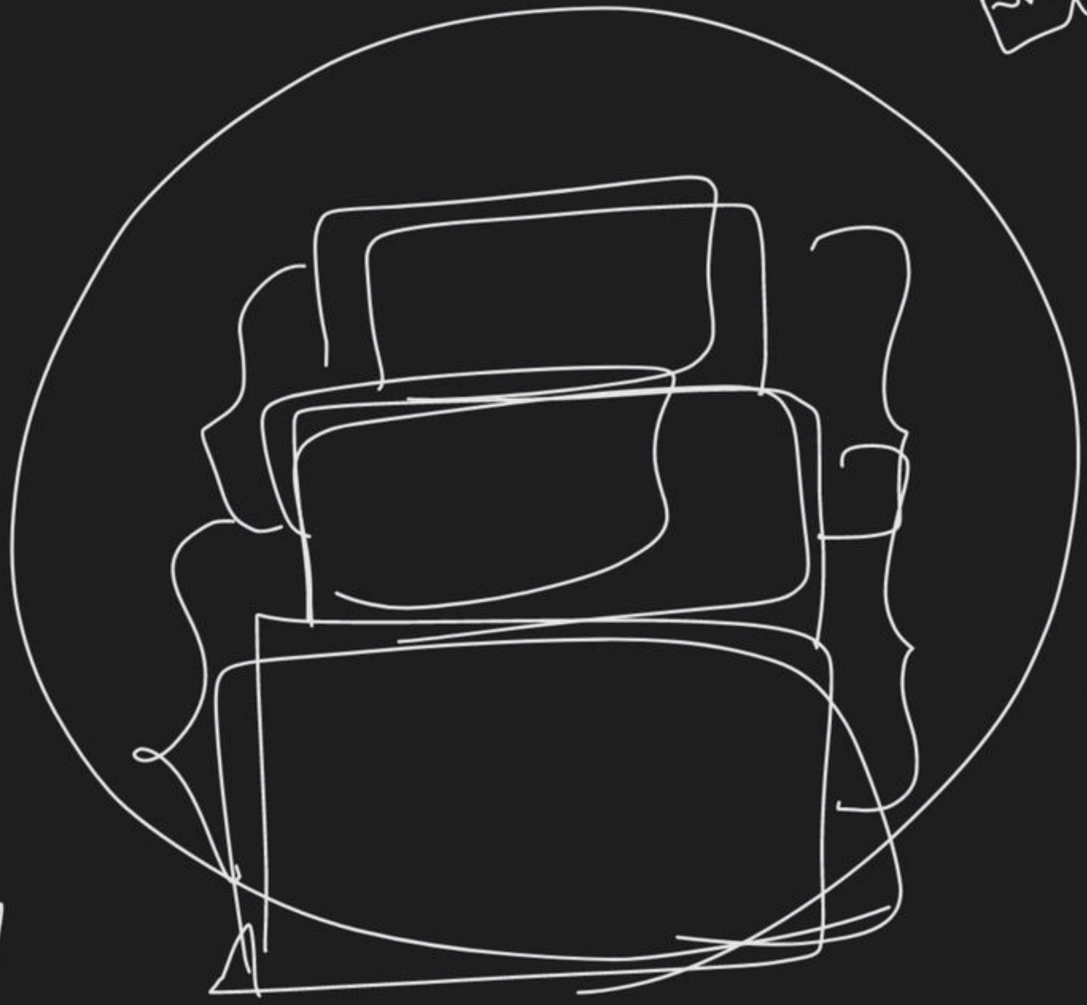

2
3
4
5
6
1
1
1
1

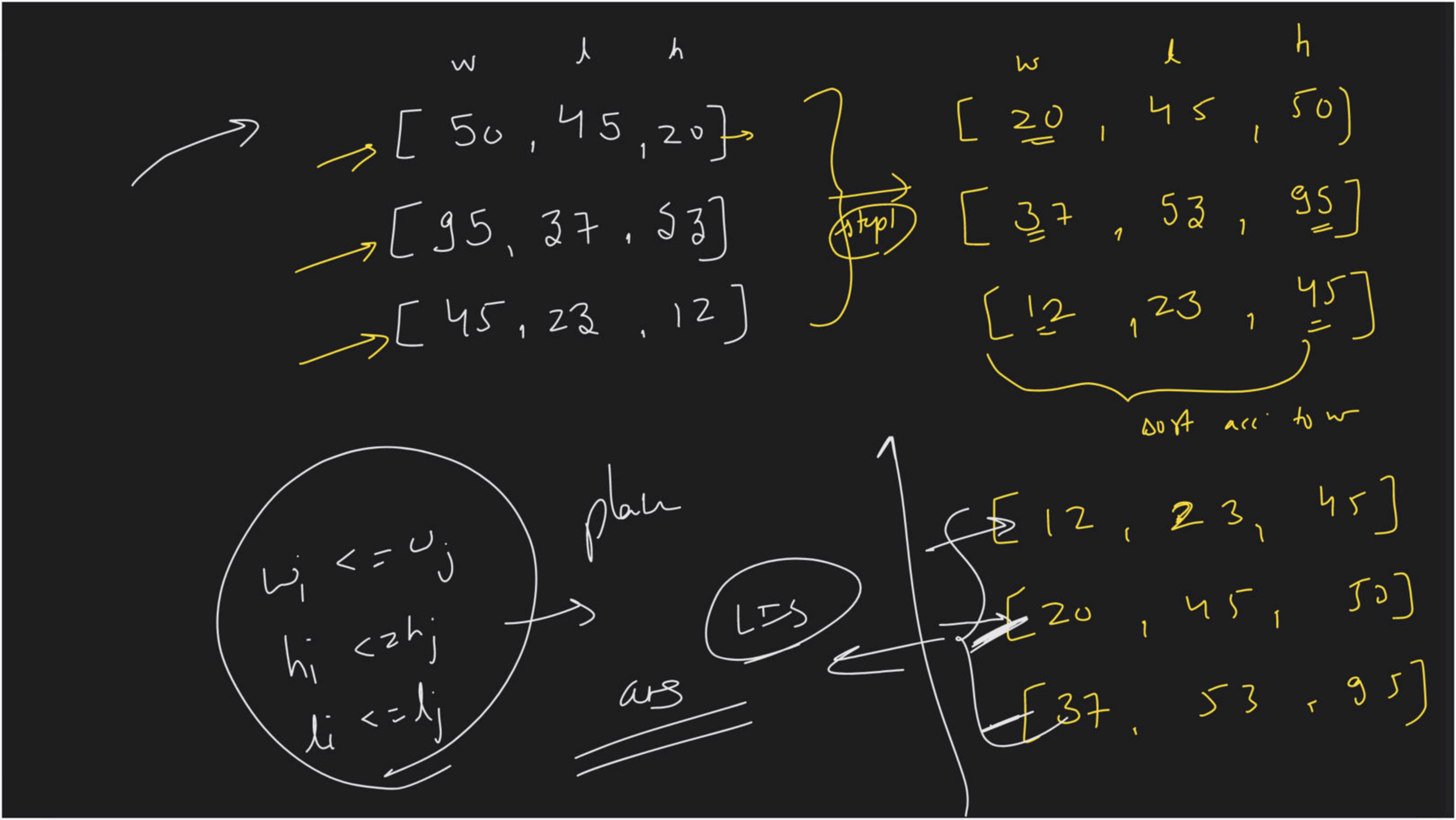

h/w
Russian Doll
Sorting Logic
arr → [5,4], [6,4], [6,7], [2,3]
w
h
w → inc order sort
w1 = w2 → desc height
w
[2,3]
[5,4]
[6,7]
[6,4]
w1 = w2
h

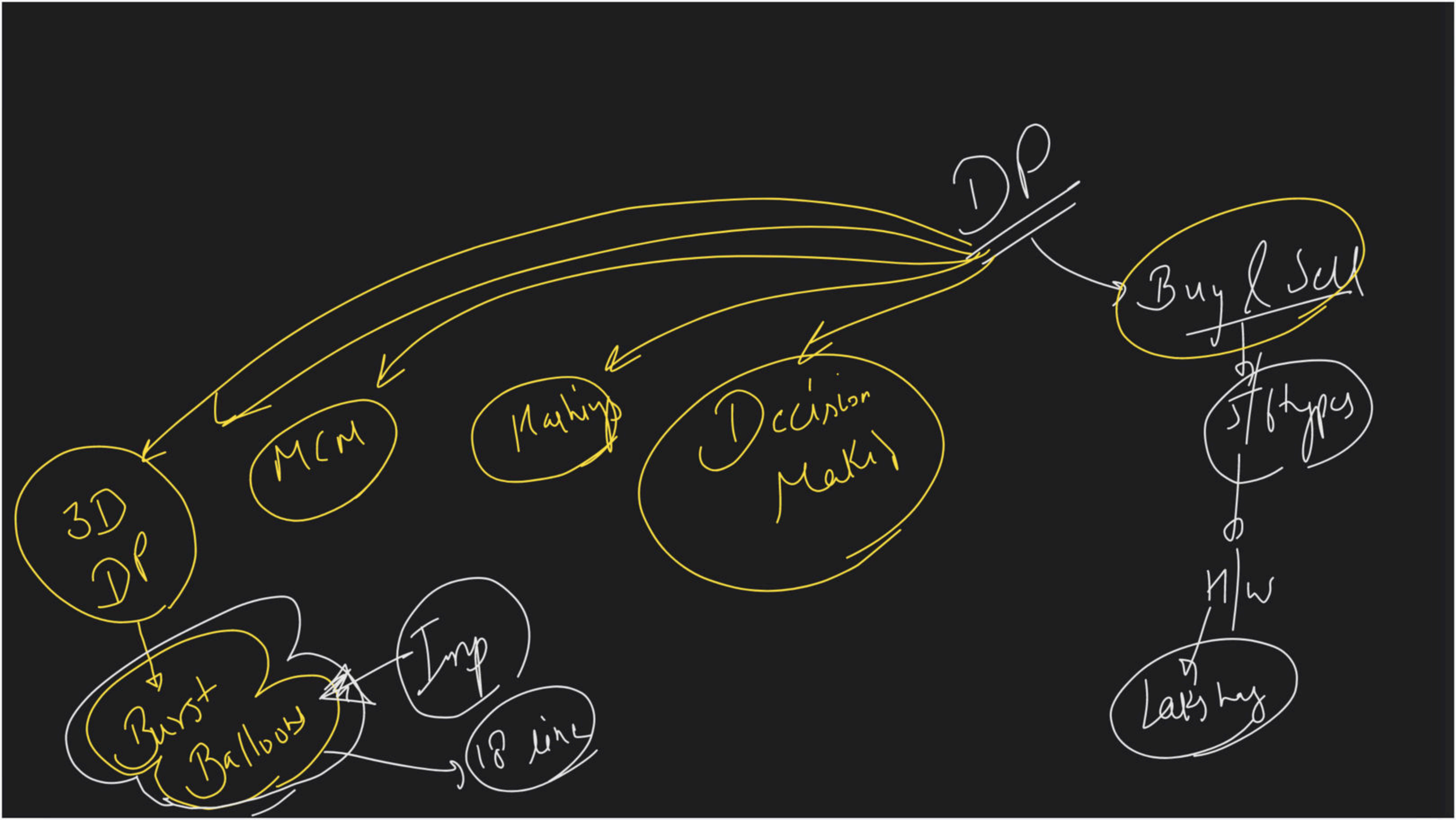

[1,1]
[1,1]
[1,1]
1
4
3
2
2
5

→ Max height by stacking cuboid






w l h
[50, 45, 20]
[95, 37, 53]
[45, 23, 12]
sort
w l h
[20, 45, 50]
[37, 53, 95]
[12, 23, 45]
sort acc to w
$w_i <= w_j$
$h_i <= h_j$
$l_i <= l_j$
plan
LIS
ans
[12, 23, 45]
[20, 45, 50]
[37, 53, 95]


DP
Buy & Sell
MCM
Matrix
Decision Maki
3D DP
Burst Balloon
Imp
18 line
5 8 types
H/W
Lakshay

Graphs → Next class