Dynamic Programming Class - 2

Special class

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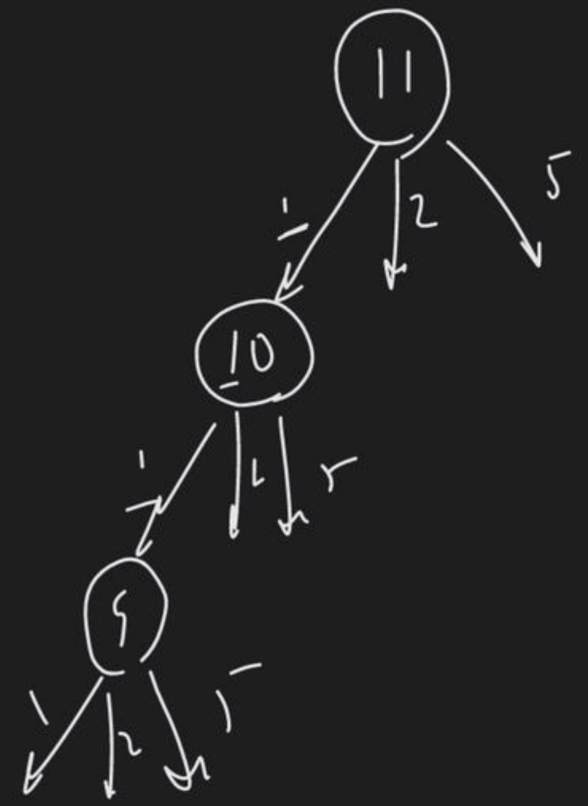
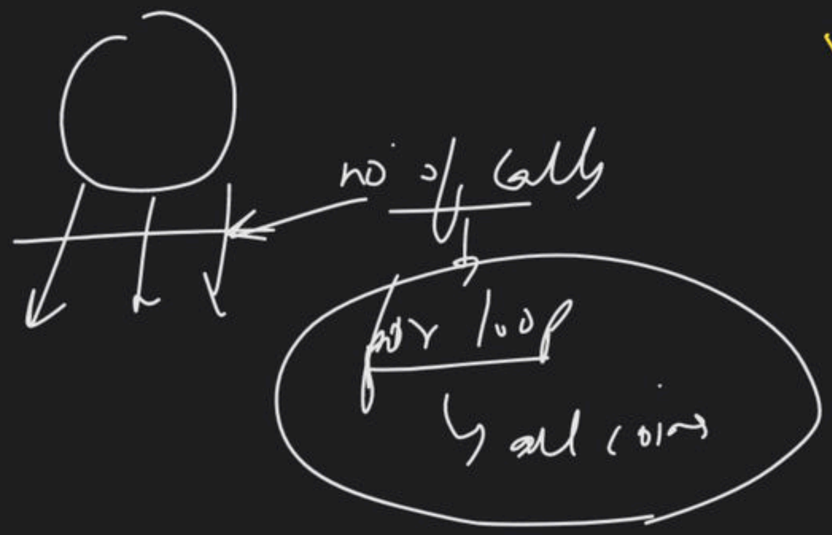
Coin change:-

i/p → coins → [ ] → { 1, 2, 5 } (infinite)

target amount → 11

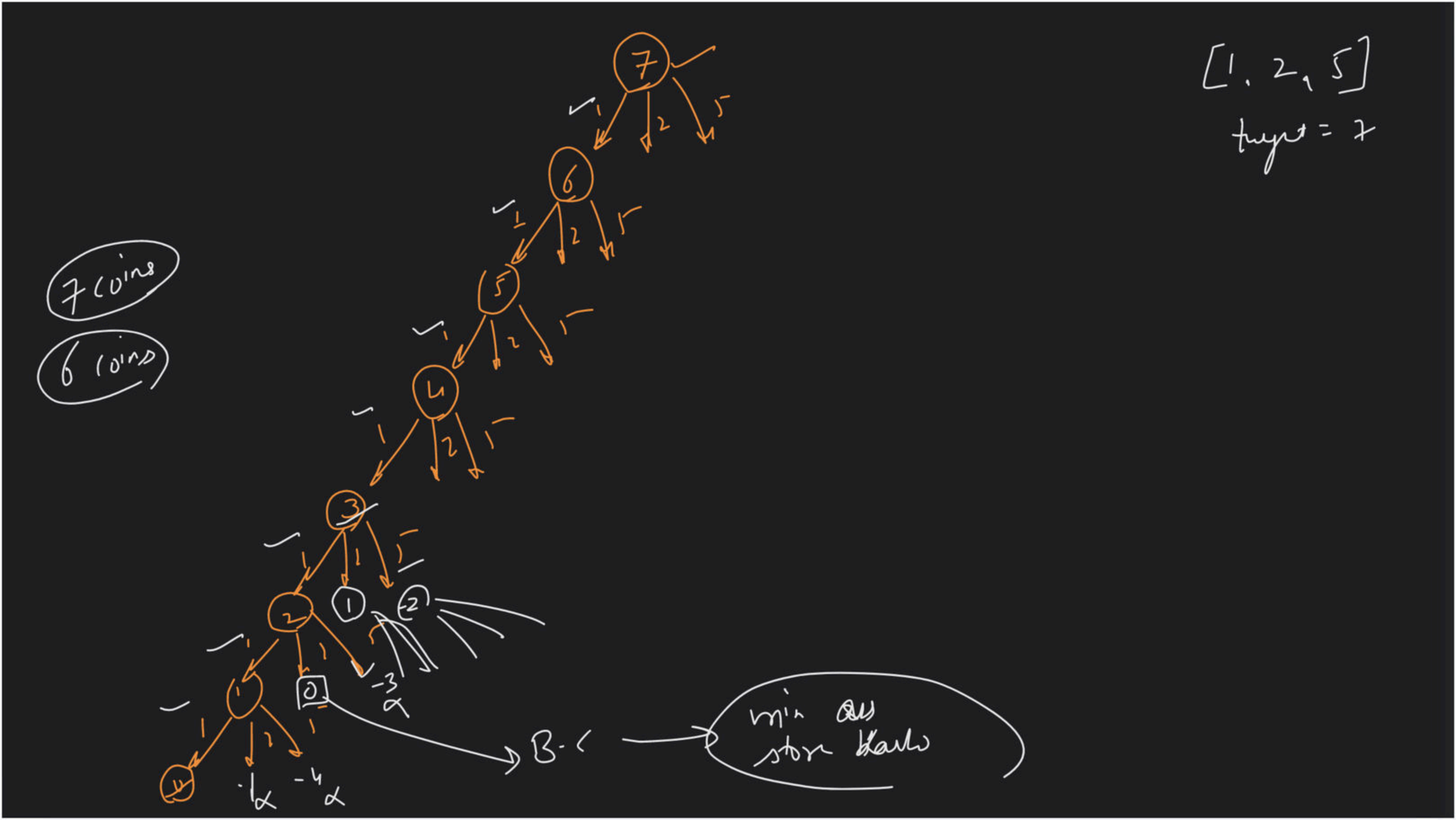
find min no of coins to create target amount

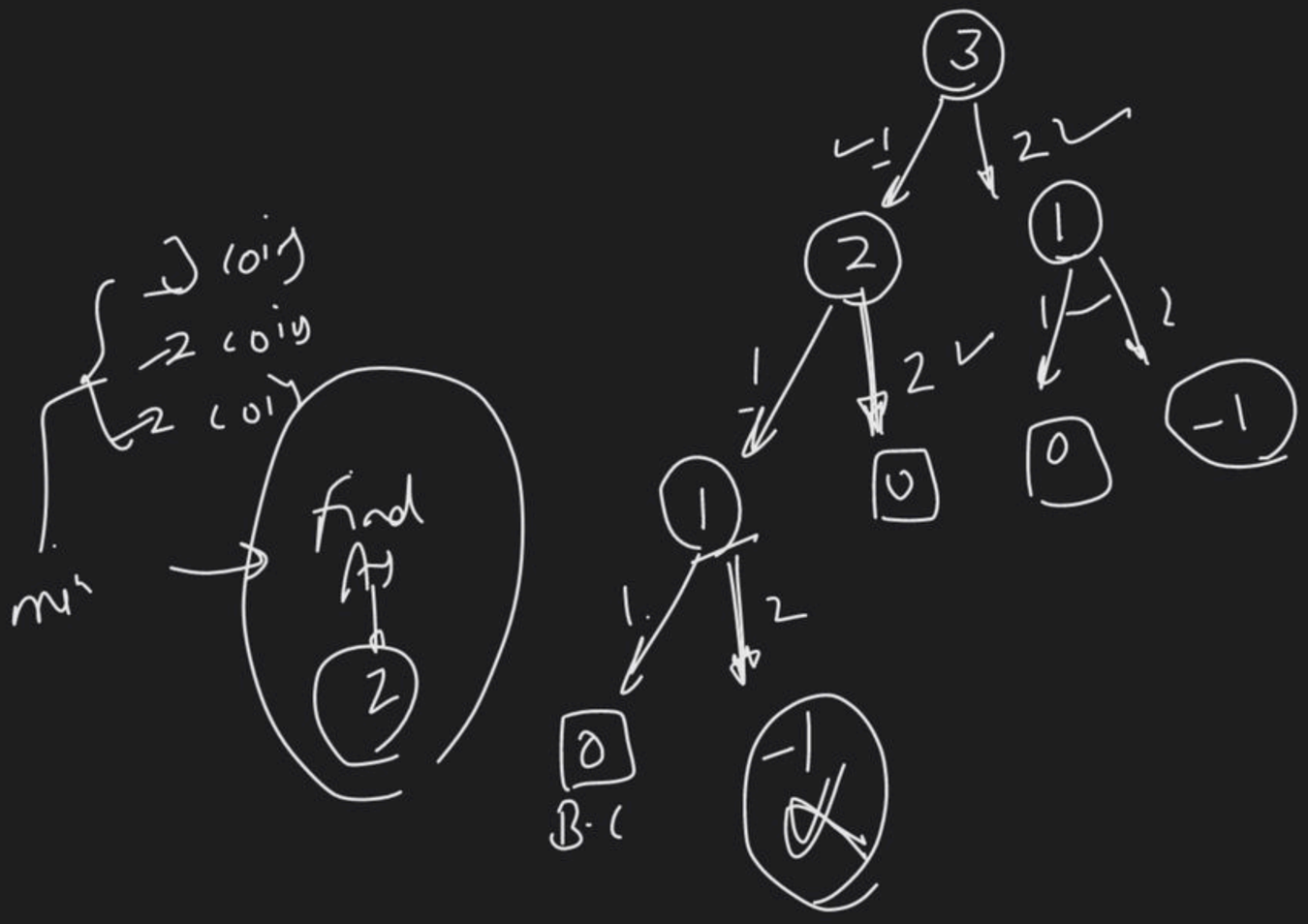




curr amount = 0 → target

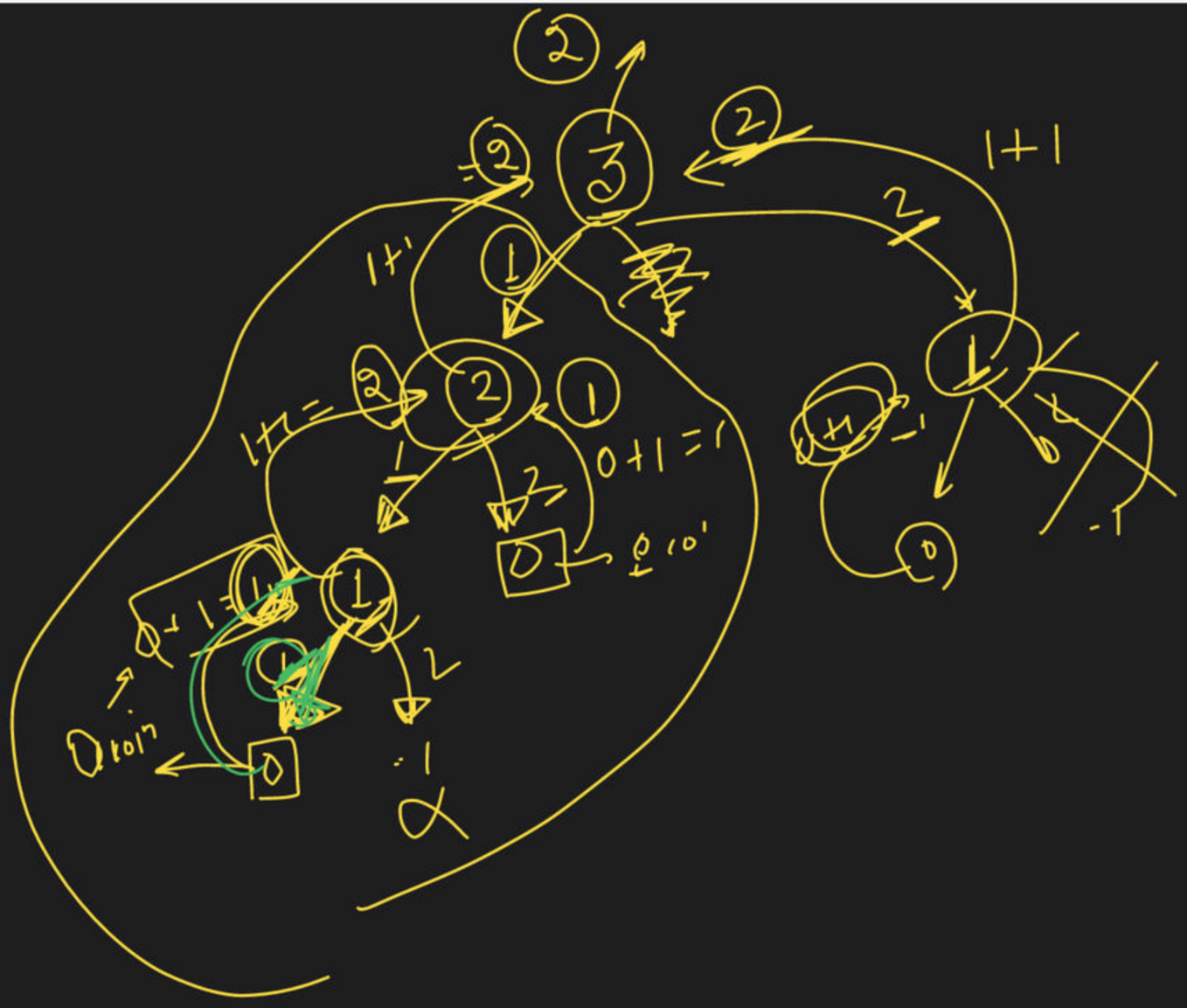
target = curr amount = target → 0

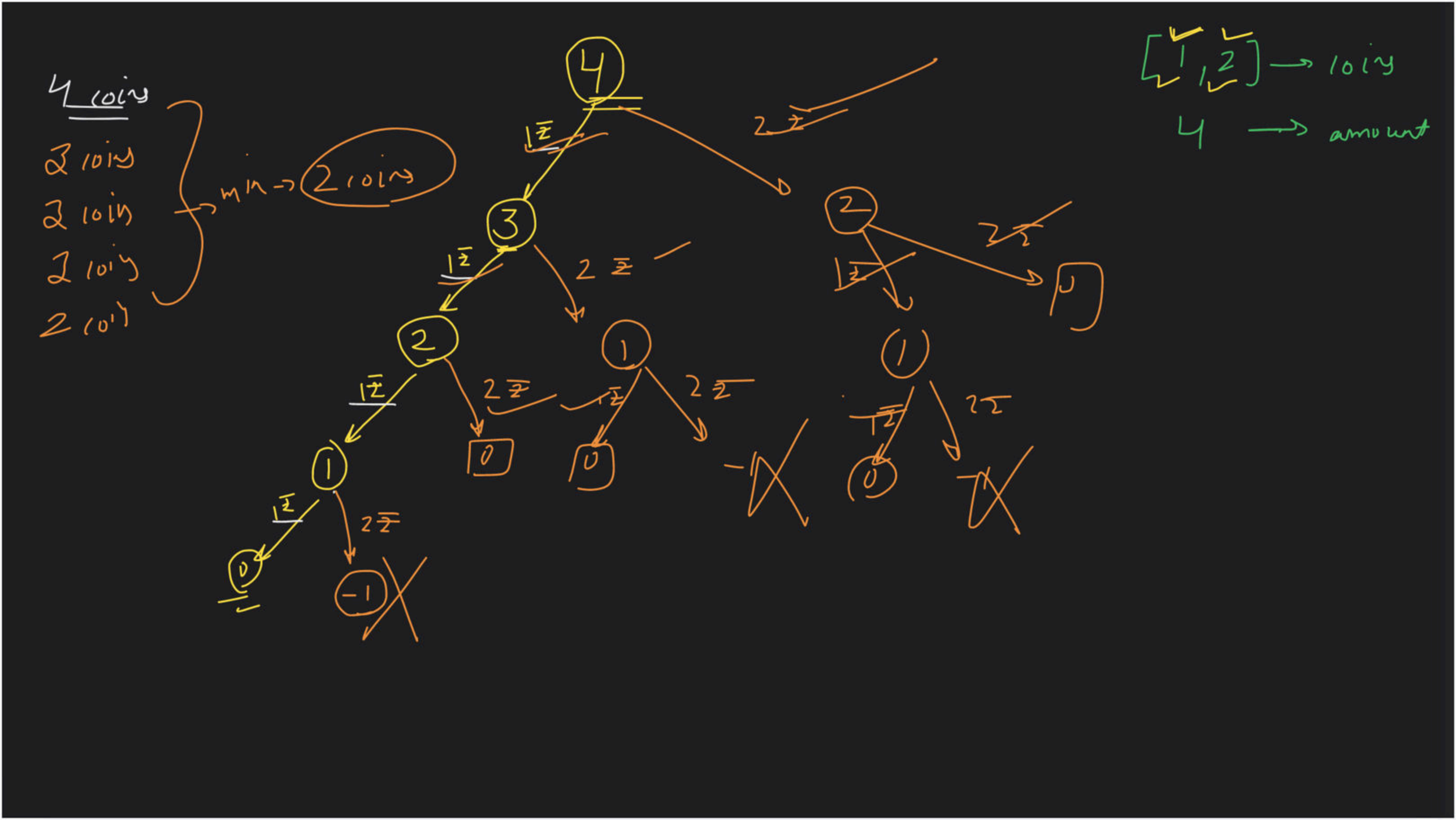

[1, 2, 5]
type = 7
7 coins
6 coins
7
6
5
4
3
2
1
0
-1
-2
-3
-4
B-C
min ans
stor karlo

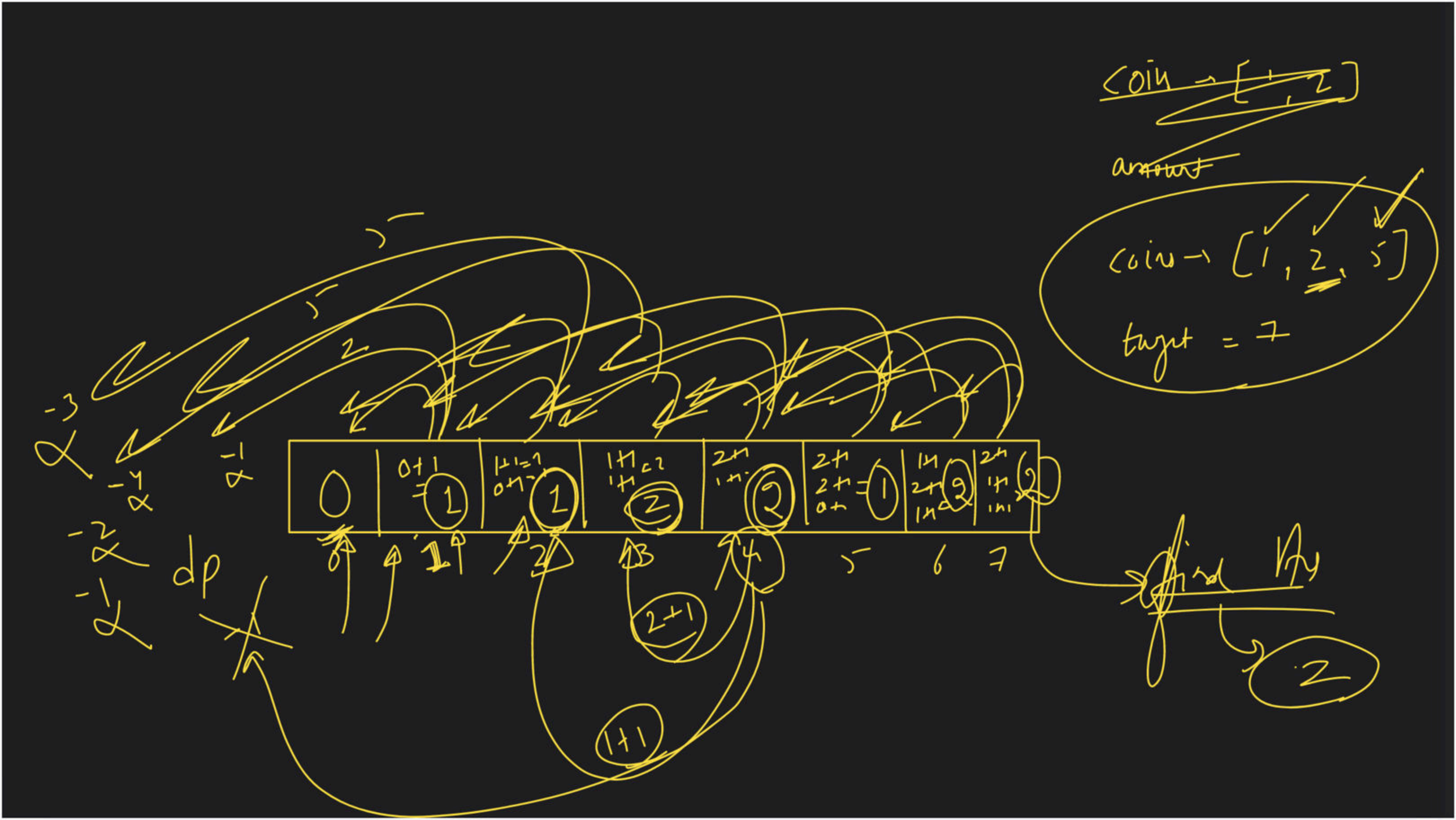


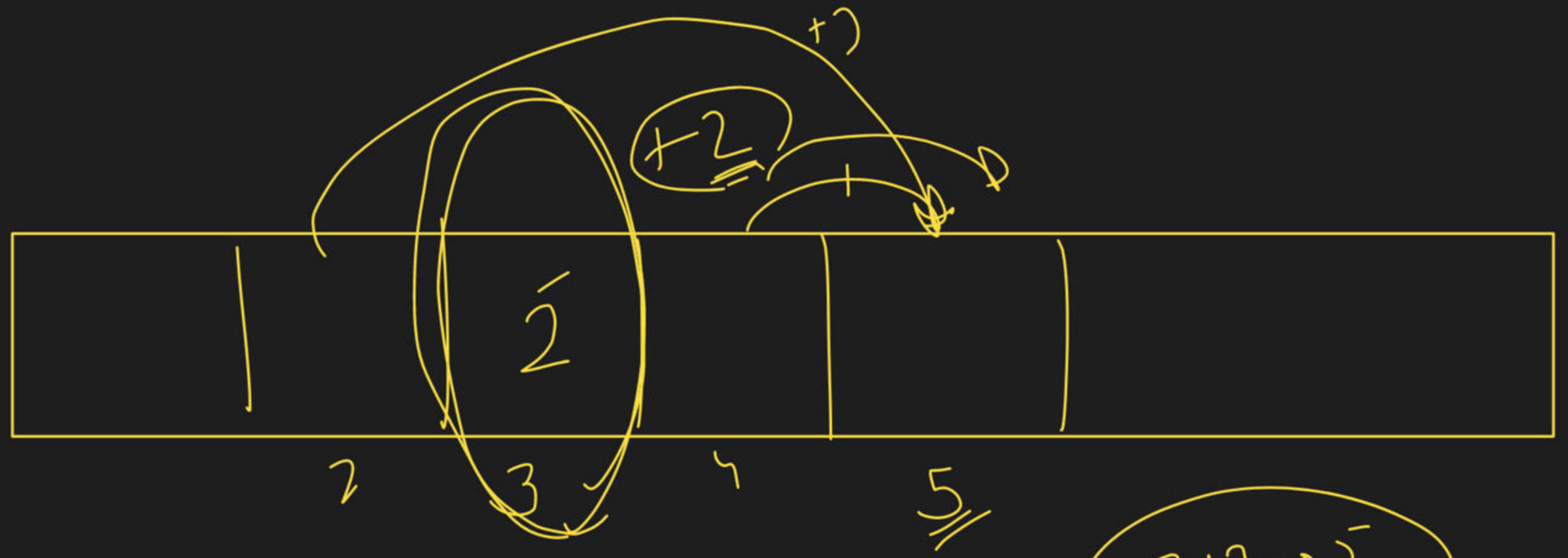
[1, 2]

two -> 3


coin → [1, 2]
amt → 3
1+1
2
1+1
0+1=1
0
-1


4 coins
2 coins
2 coins
2 coins
2 coins
min -> 2 coins
[1, 2] -> coins
4 -> amount
4
3
2
1
0
-1
1₹
2₹


coin → [1, 2, 5]
amount
coin → [1, 2, 5]
target = 7
dp
0
1
2
3
4
5
6
7
2+1
1+1
2



dp(3) = 2

3 amount

min Coin => 2

2+3 → 5

4+1 → 5

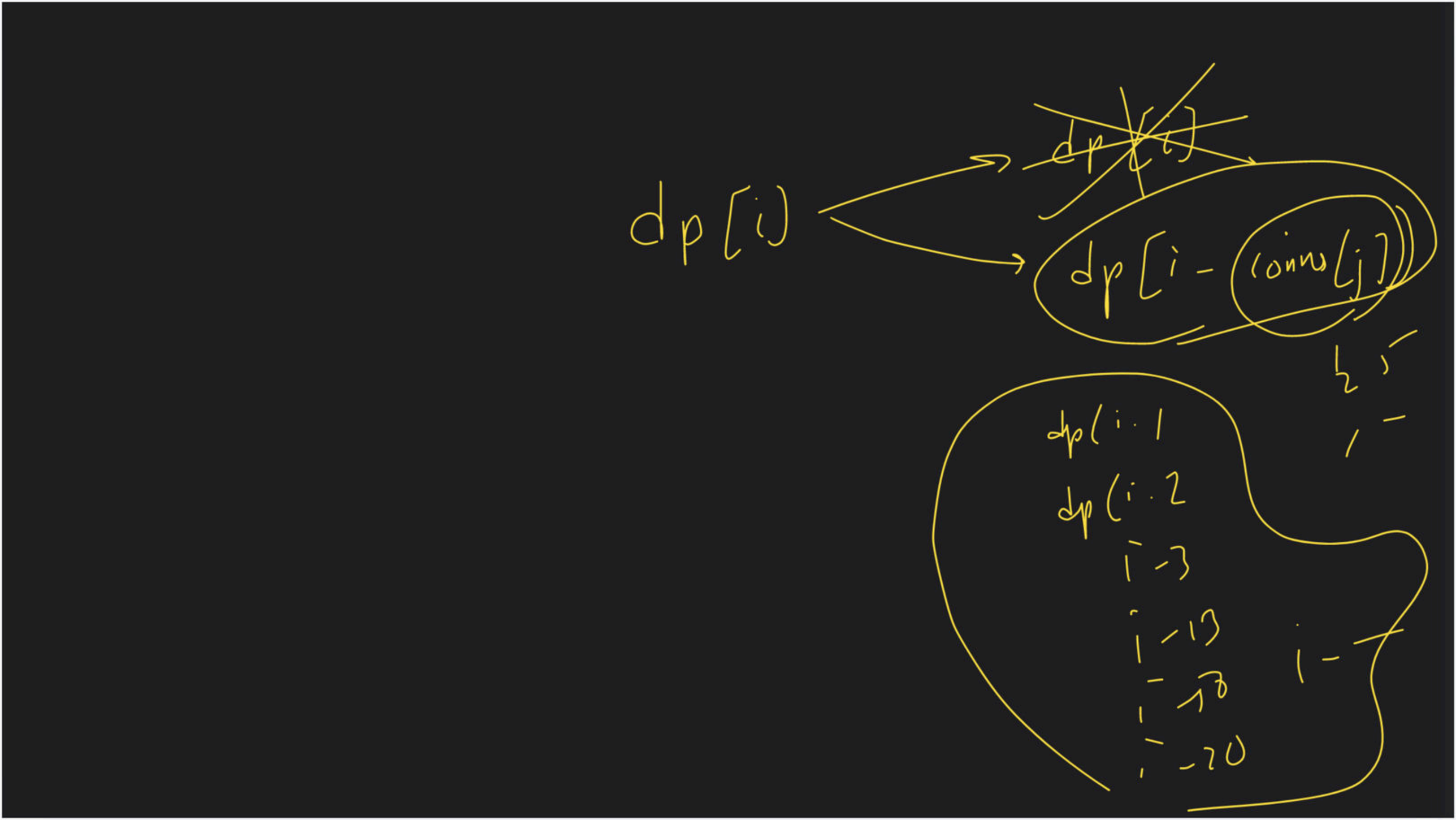
3+2 → 5

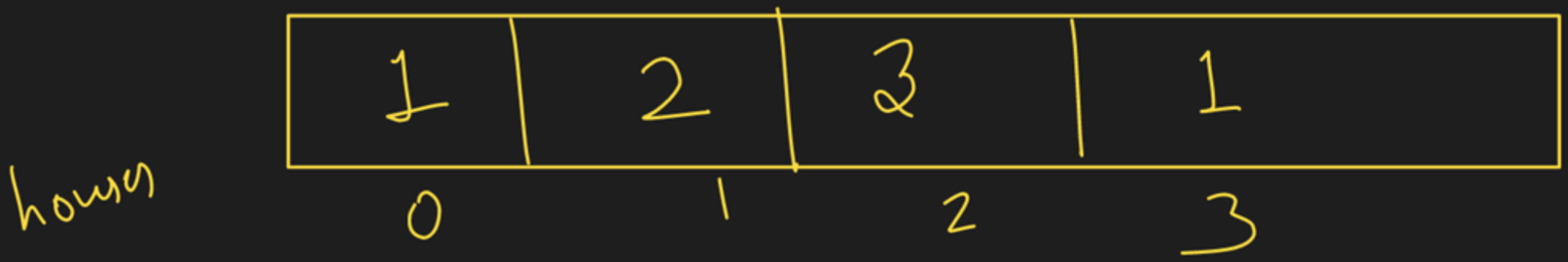
1 2 5

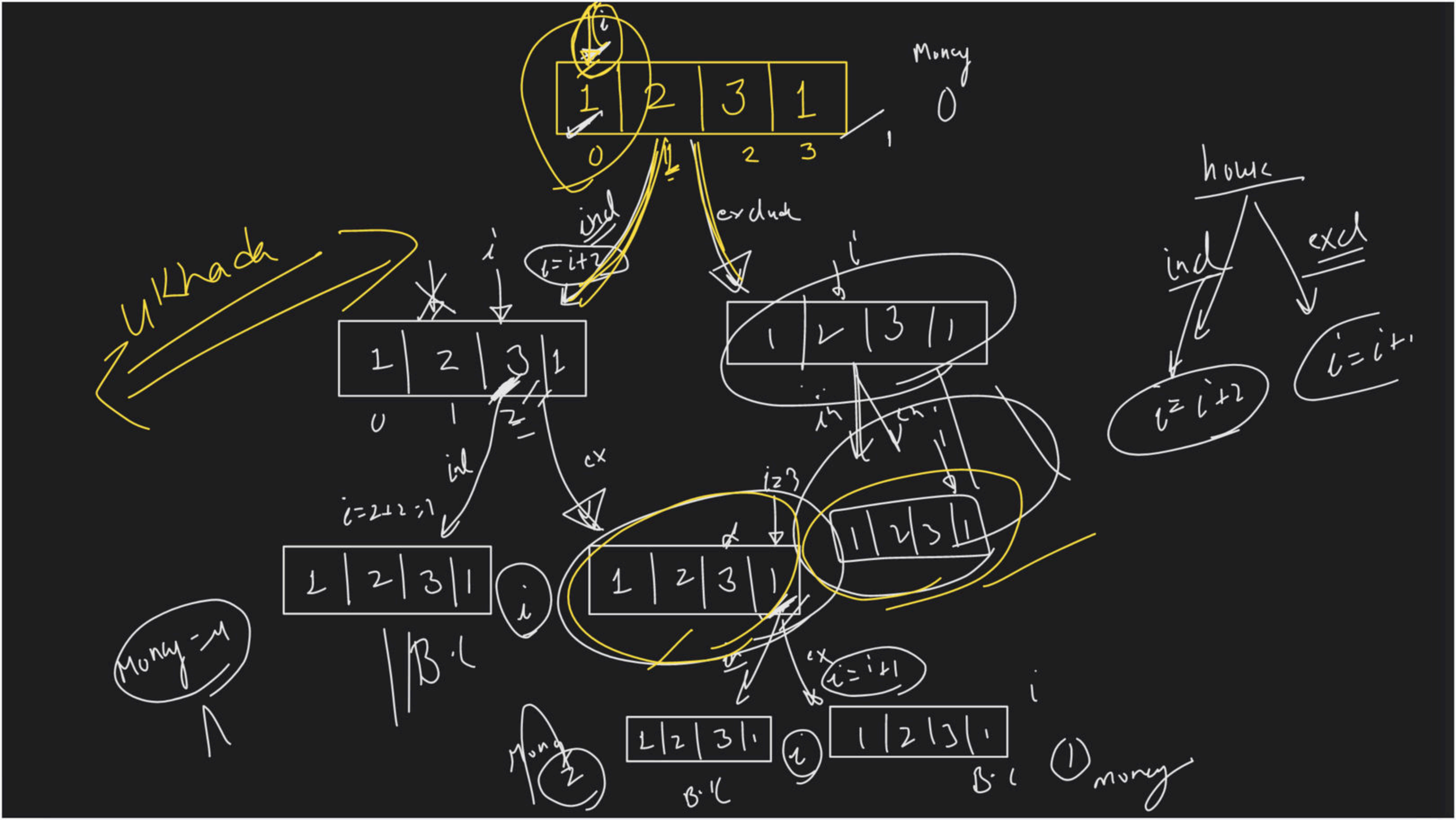
dp(i-1)

dp(i-2)

dp(i-5) dp[i]


dp[i]
dp[i - coins[j]]

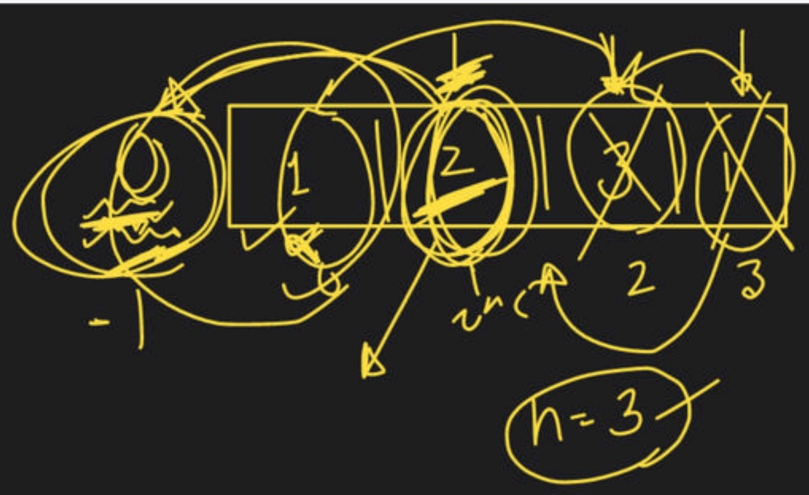

houses
1
2
3
1
0
1
2
3

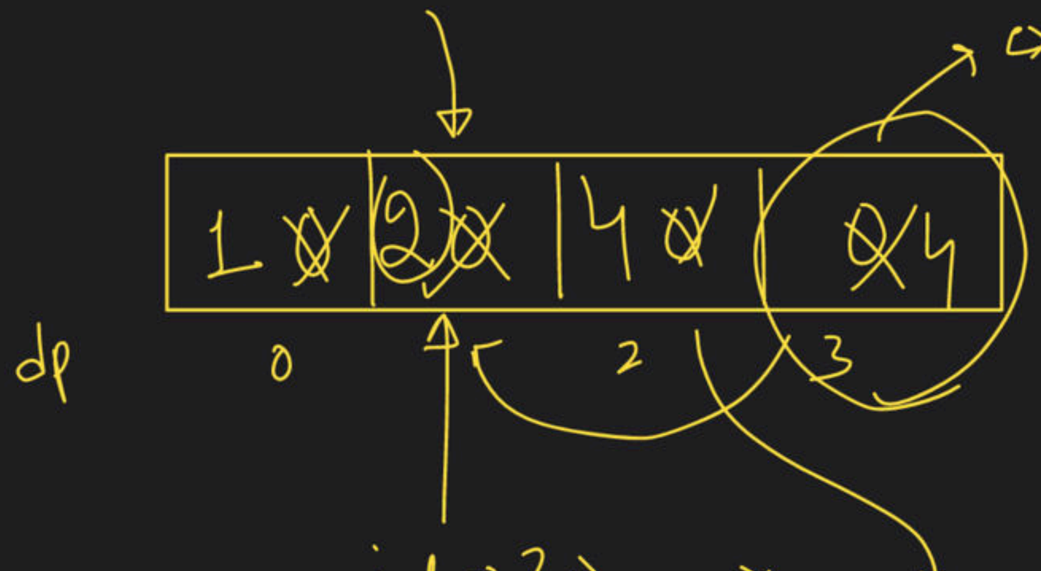

i
1 2 3 1
0 1 2 3
Money
0
ind
exclude
i = i+2
i = i+1
Ukhada
home
ind
excl
i = i+2
i = i+1
1 2 3 1
0 1 2 3
ind
ex
i = 2+2 = 4
i = 3
1 2 3 1
1 2 3 1
1 2 3 1
Money = 4
Bill
Bill
Bill
money
ex
i = i+1

dp[0] = nums[0]

dp[i]

Tabulation





nth size = 4

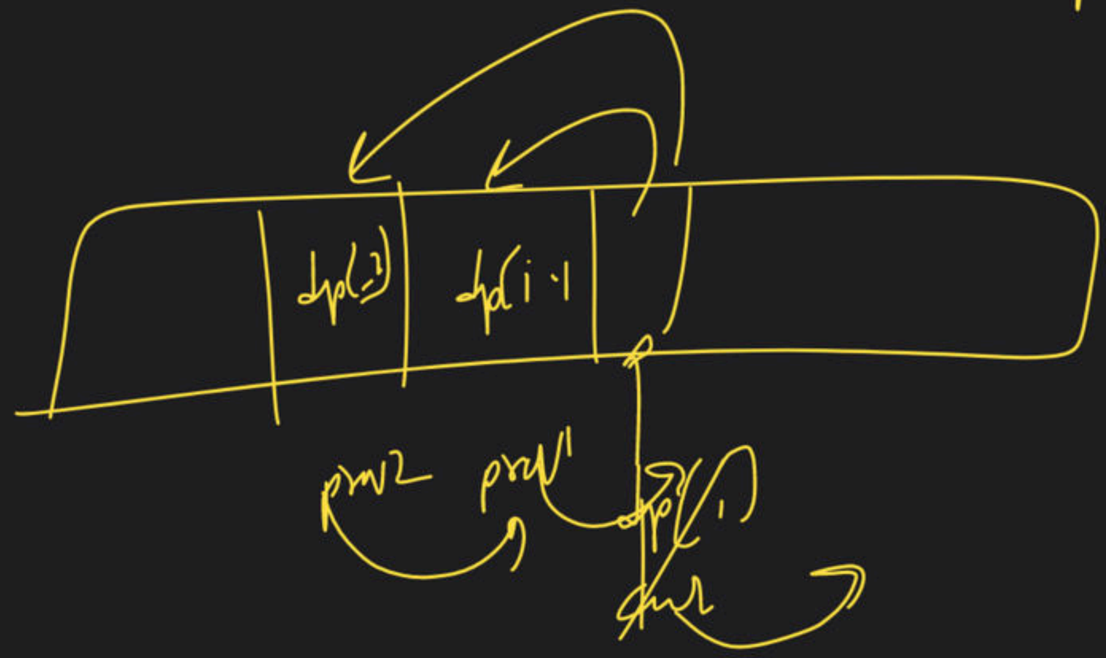
dp array

for (i → 1 → <=n

<=3

dp[i] -> dp[i-2]

dp[i] -> dp[i-1]



for (i = 1 → <=n)