Good Evening

Doubt Clearing Session - Part X

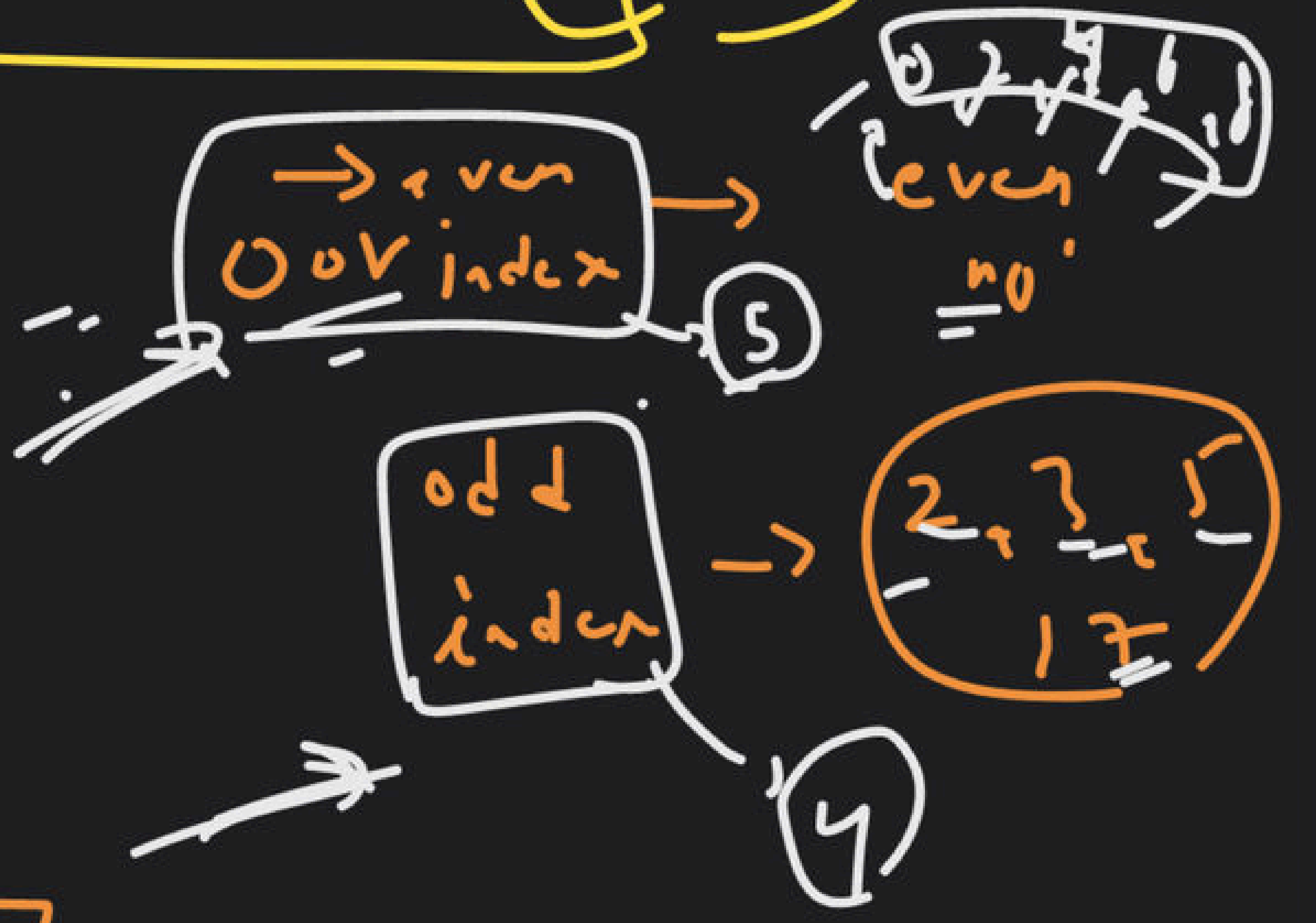
BAD = NEWS

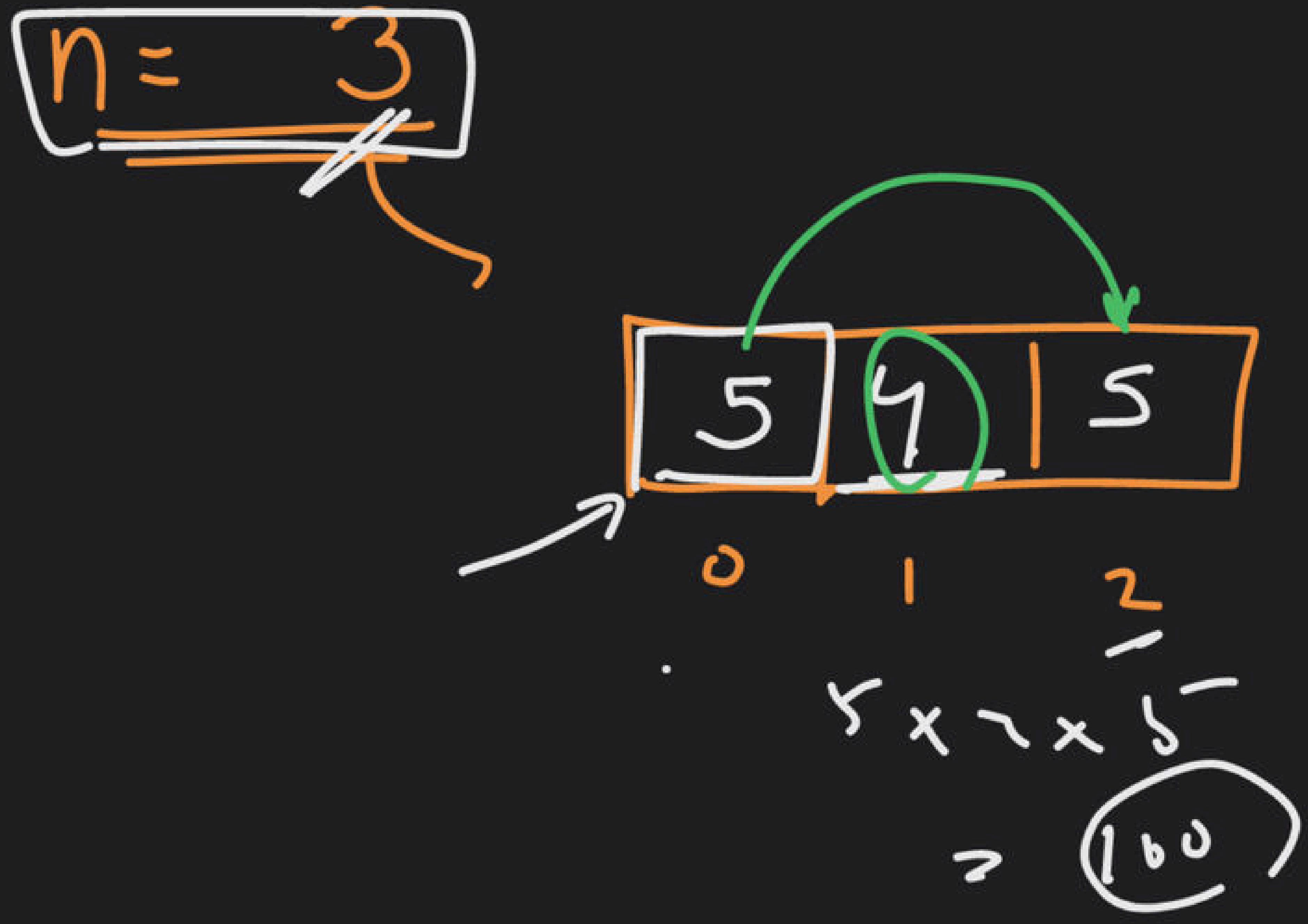
Foundation Course on Data Structures & Algorithm - III

Love Babbar • Lesson 10 • June 19, 2022

Recursion:-

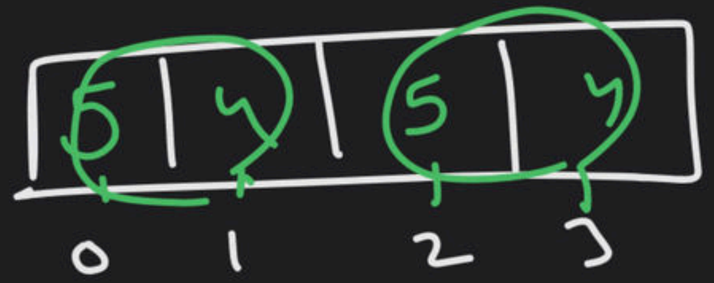
Count Good Numbers:-



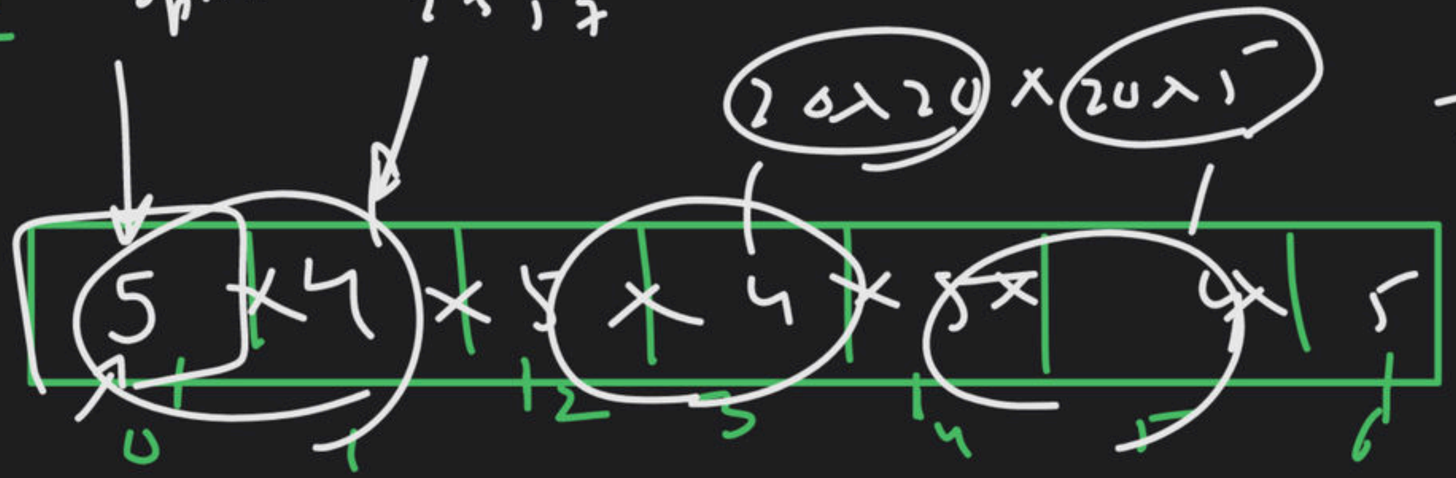


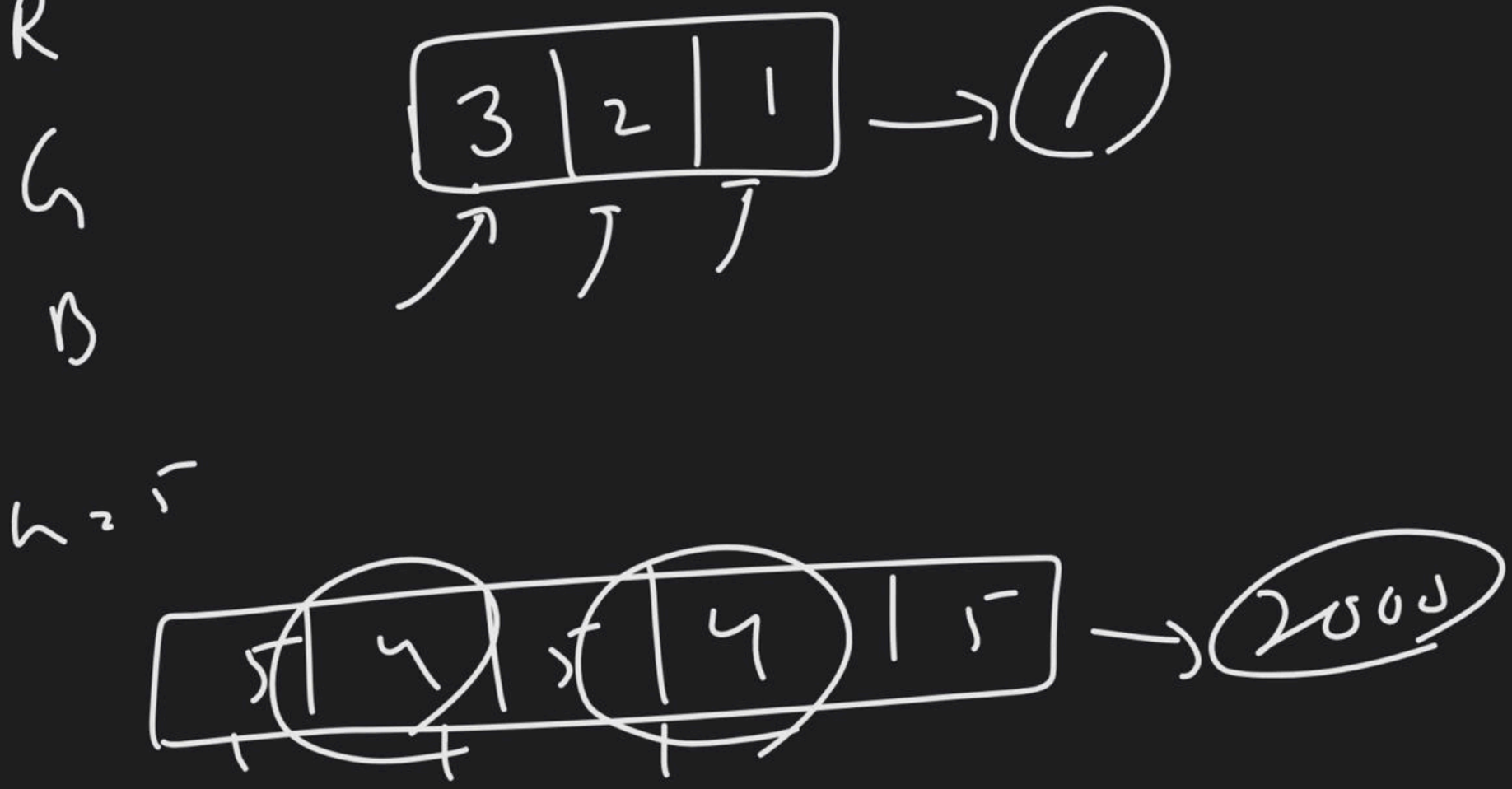
n > 4

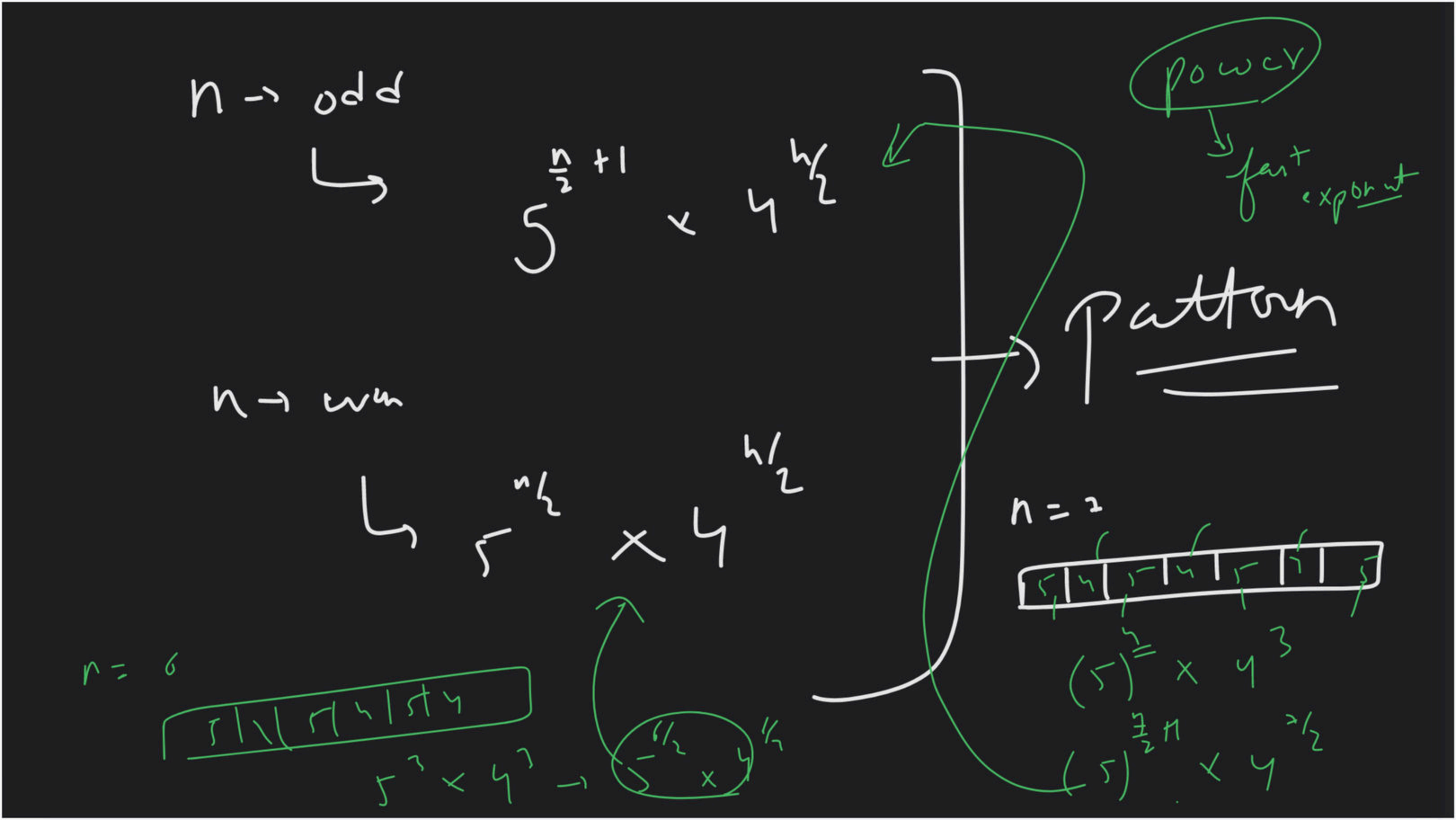
n → odd

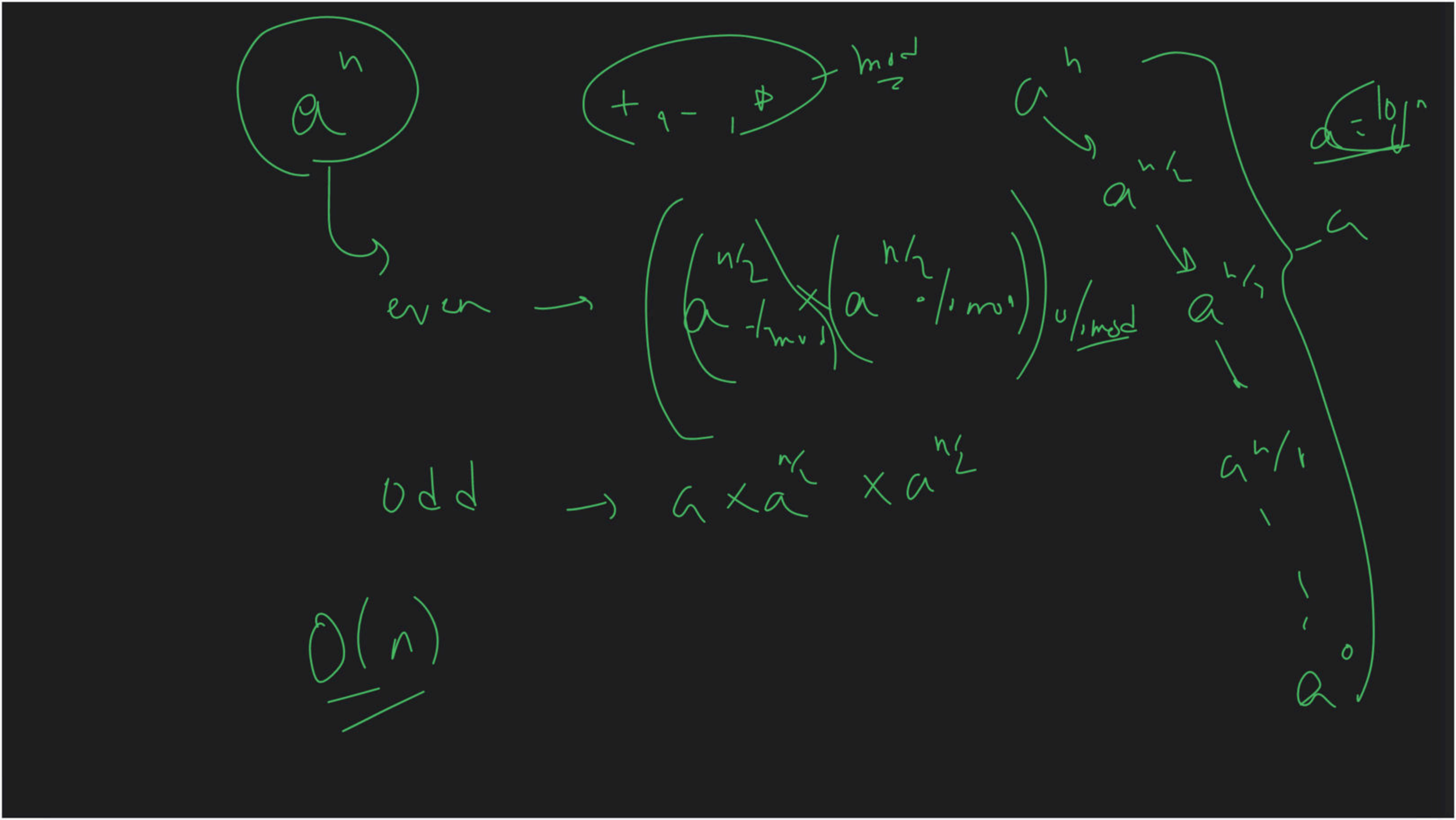


h = 7



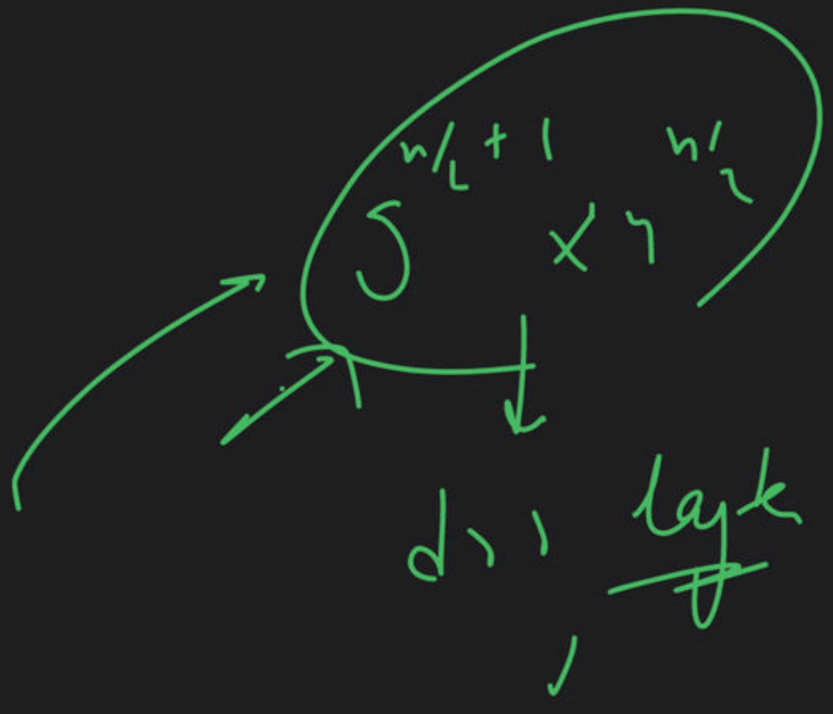

R
G
B
3
2
1
1
h = 5
5
4
5
4
5
200


n → odd
x^(n/2+1) × y^(n/2)
n → even
x^(n/2) × y^(n/2)
pow(x,y)
fast exponent
pattern
n = 2
n = 6
x^3 × y^3
x^3 × y^3 → x × y


a^n
even
odd
$a \times a^{n/2} \times a^{n/2}$
$O(n)$
$a^n \to a^{n/2} \to a^{n/4} \to \cdots \to a^0$
$a = 10^n$

even index → even nd → 0, 2, 4, 6, 8 → (5)

odd + 2, 3, 5, x → (4)



18 → 18 →

231

Discord

pair pro

Dipanshu

NU

Pijush

Hrishy

Udita

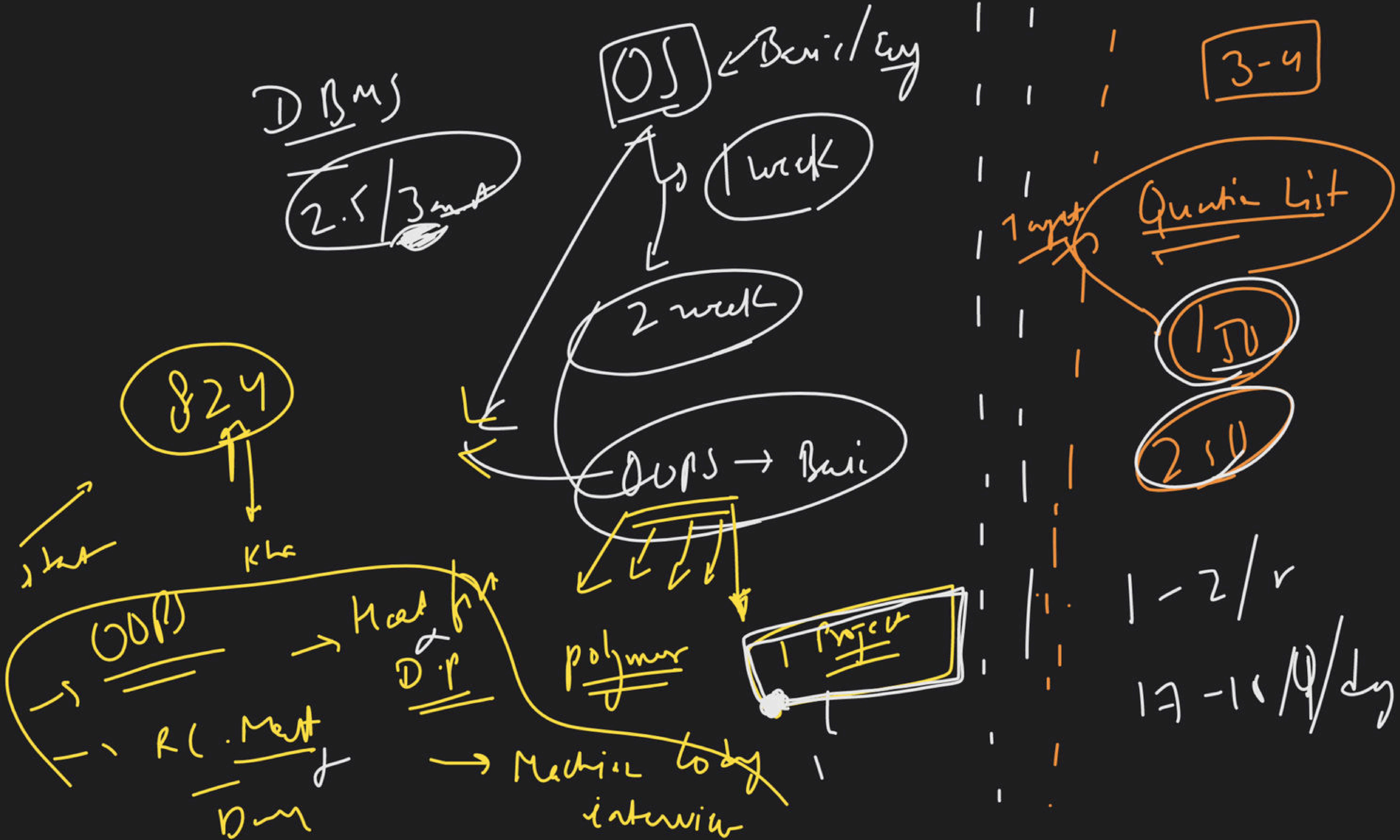
Himanshu

Sum 2011

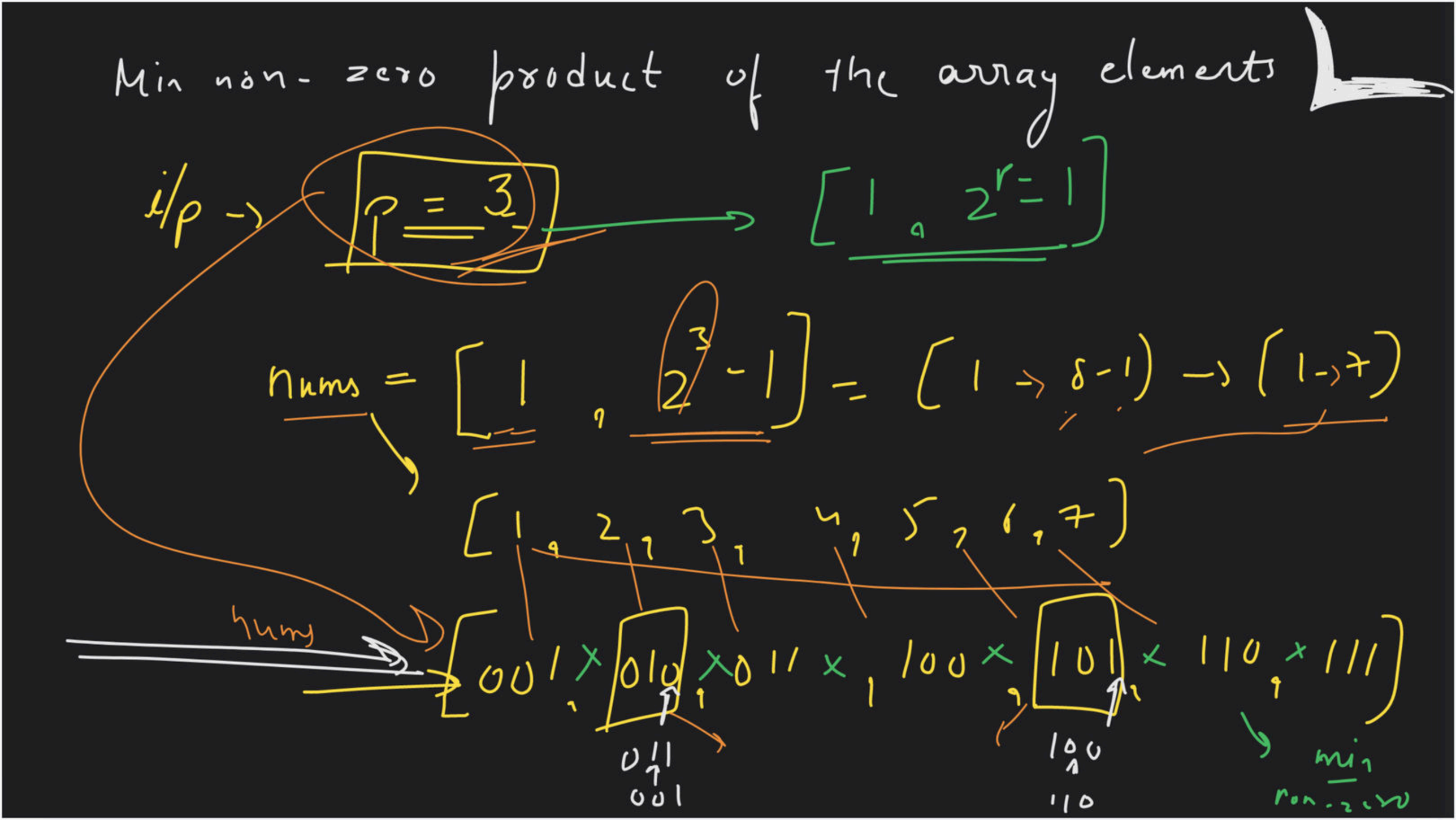
Sonam

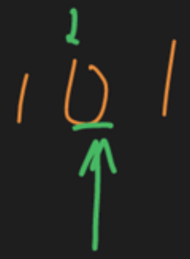
Archit

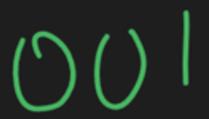
pattern → practice


DBMS
OS
1 week
2 week
824
OOPS
D.P
1 Project
3-4
Target
1-2/r

Min non-zero product of the array elements







#define MOD 1000000007

P = 1

[1, 2-1] → [1, 2-1)

[1-1)

[1)

↳ [1] ⟶ ans = 1

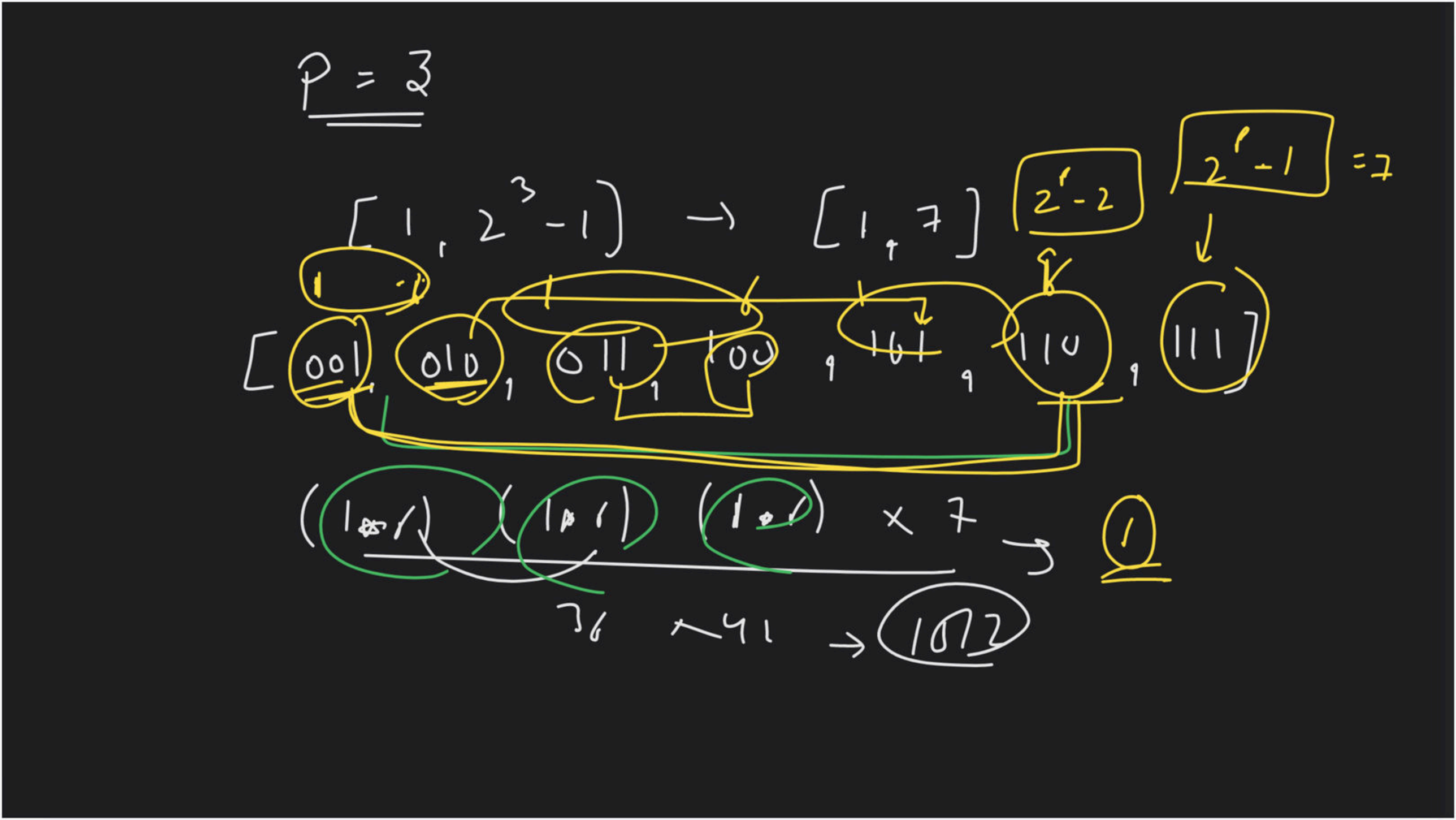
$p = 2$

$[1, 2^2 - 1) \rightarrow [1, 4)$

$[1, 3]$

$[01, 10, 11]$

$1 \wedge 2 \times 3 \rightarrow (1)$


P = 3
[1, 2^3 - 1) → [1, 7]
2^P - 2
2^P - 1 = 7
001
010
011
100
101
110
111
((1*1) (1*1) (1*1) × 7
1
36 41
1872

$P = 4$

$[1, 2^4 - 1)$ $[1 \to 15]$

a b

$1 \propto b$

[1 2 3 4 ... 15)

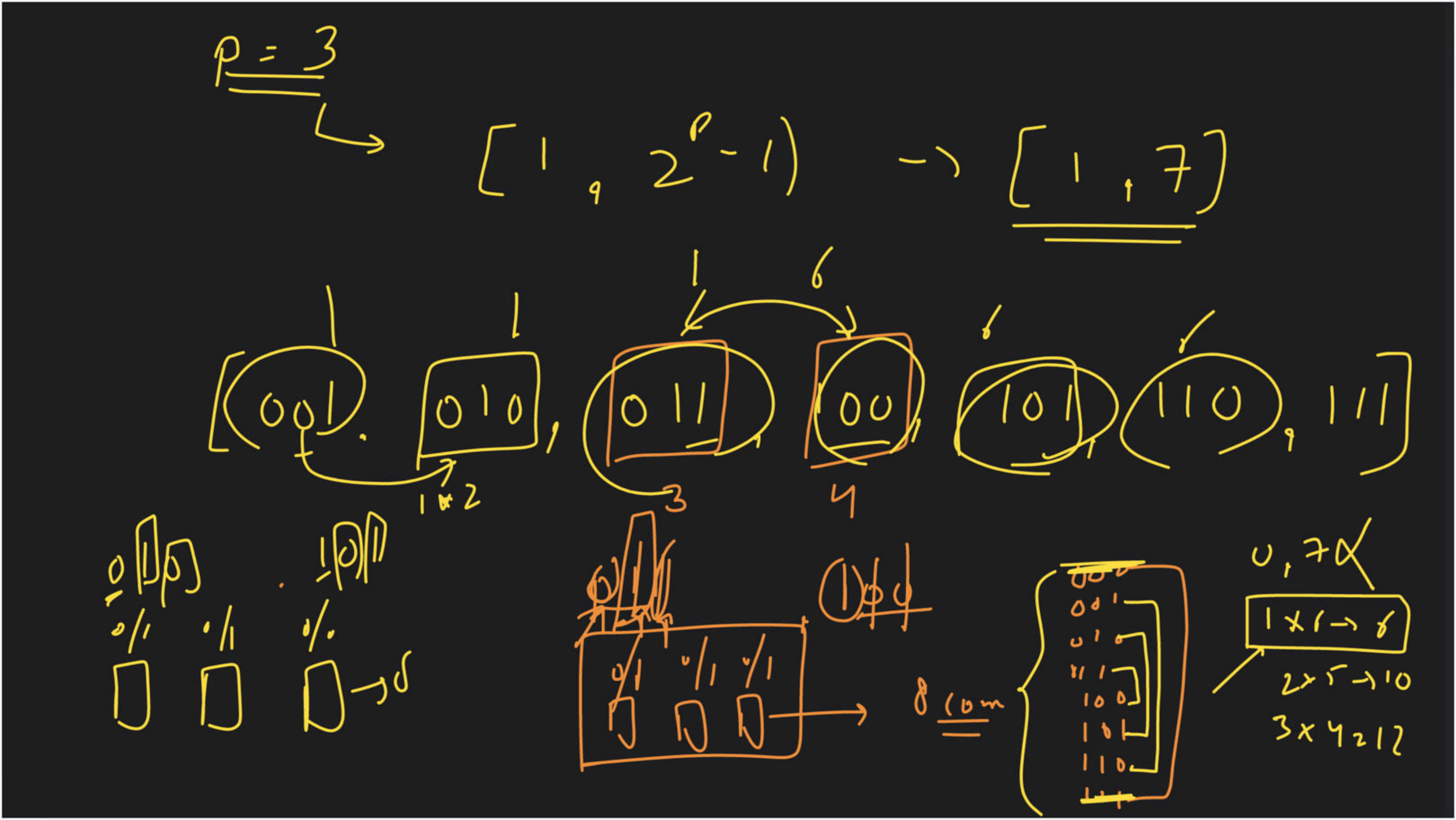
14 no.

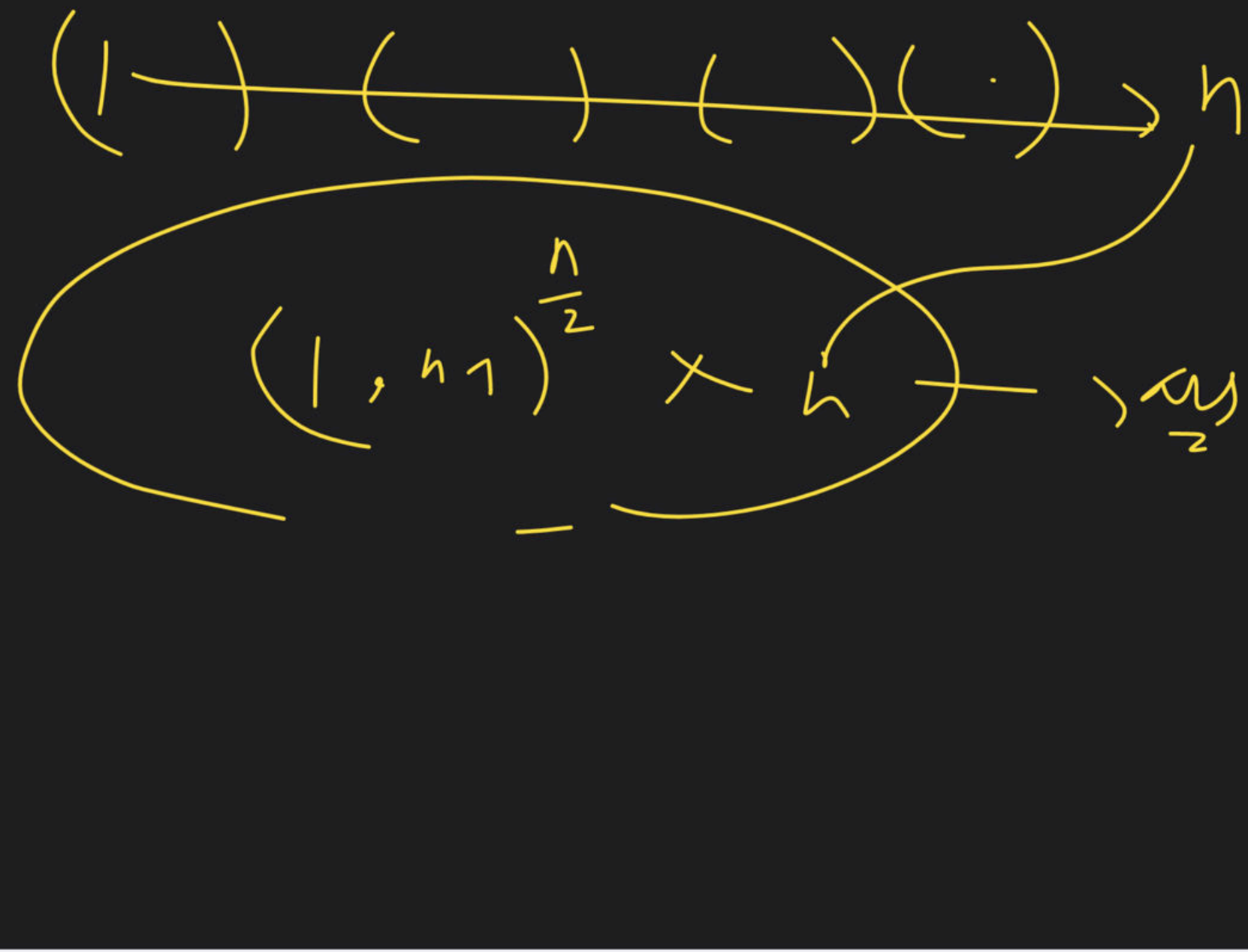
$(1 \cdot 14) \to$ 7 pair $\times 15$

$(14)^7 \times 15 =$ → 15 81 20 2 5 70 $\%_0 10^9 + 7$

$$\left[\begin{array}{cccc} 1 & - & - & - \\ & & & - \\ & & & - \\ & & & (n-1) \quad n \end{array}\right]$$

$$\left(1 \times \frac{2^{p-1}}{2}(h-1)\right) \times n$$

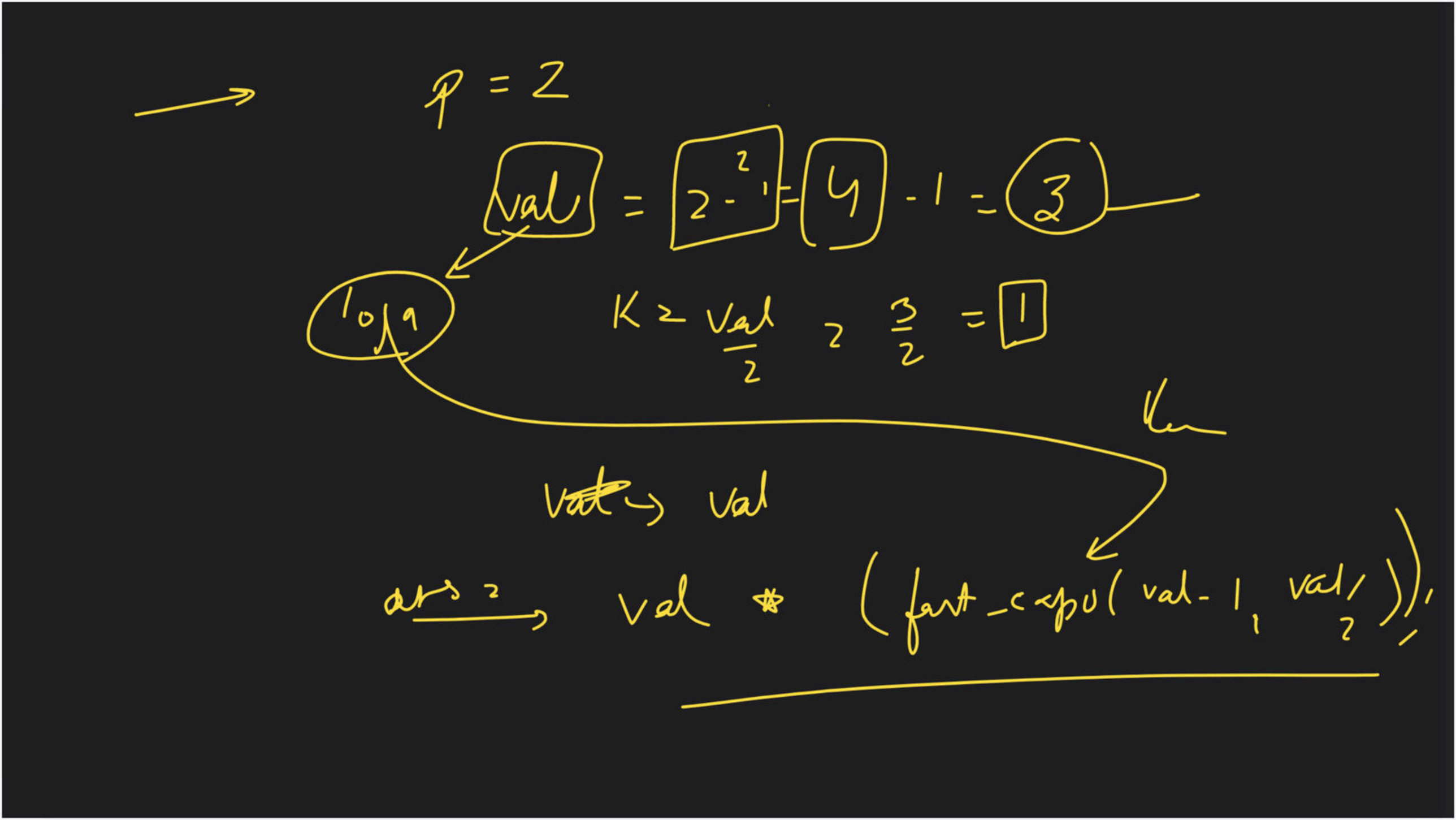

p = 3
[1, 2^p - 1) -> [1, 7]
001
010
011
00
101
110
111
1
1
1
6
6
6
1+2
3
4


( ) ( ) ( ) ( ) n
$(1, n_1)^{\frac{n}{2}} \times n$
$\frac{n}{2}$

pow

$$\left(2^{R}-2\right)^{\frac{(2^{R}-1)\,val}{2}} \times \left(2^{R}-1\right)^{val}$$

$$\left(val-1\right)^{\frac{val}{2}} \times val$$


p = 2
val = 2^2 - 1 + 4 - 1 = 3
log
K = val/2 = 3/2 = 1
val → val
else
else → val * (fast_expo(val - 1, val/2))

Permutation Sequence

→

n -> 3 , K = 3

{1, 2, 3}

S = { 123 }

13 2

213

logic

easy or not ?

~~123~~

~~132~~

~~213~~ → ans

231

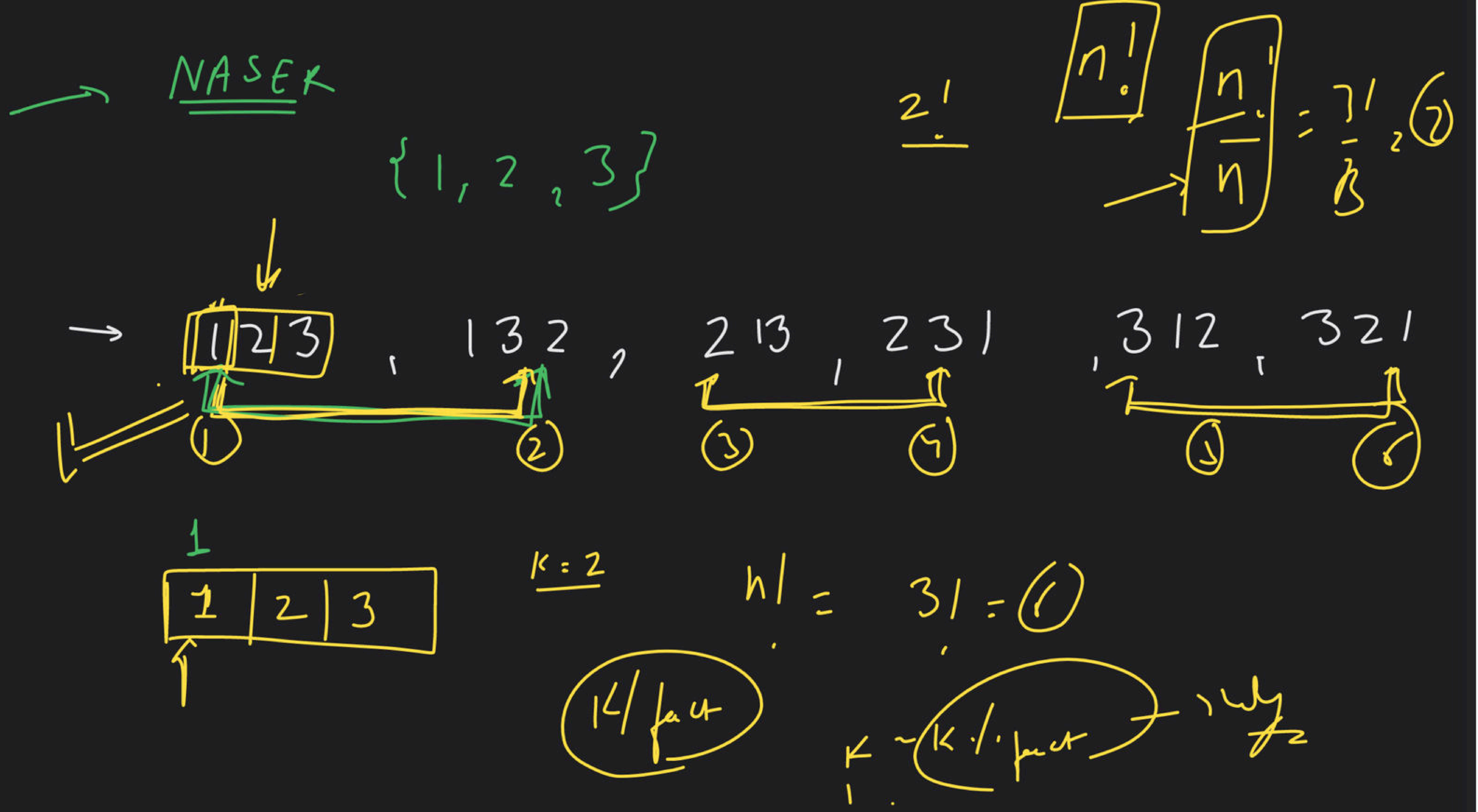
312

321

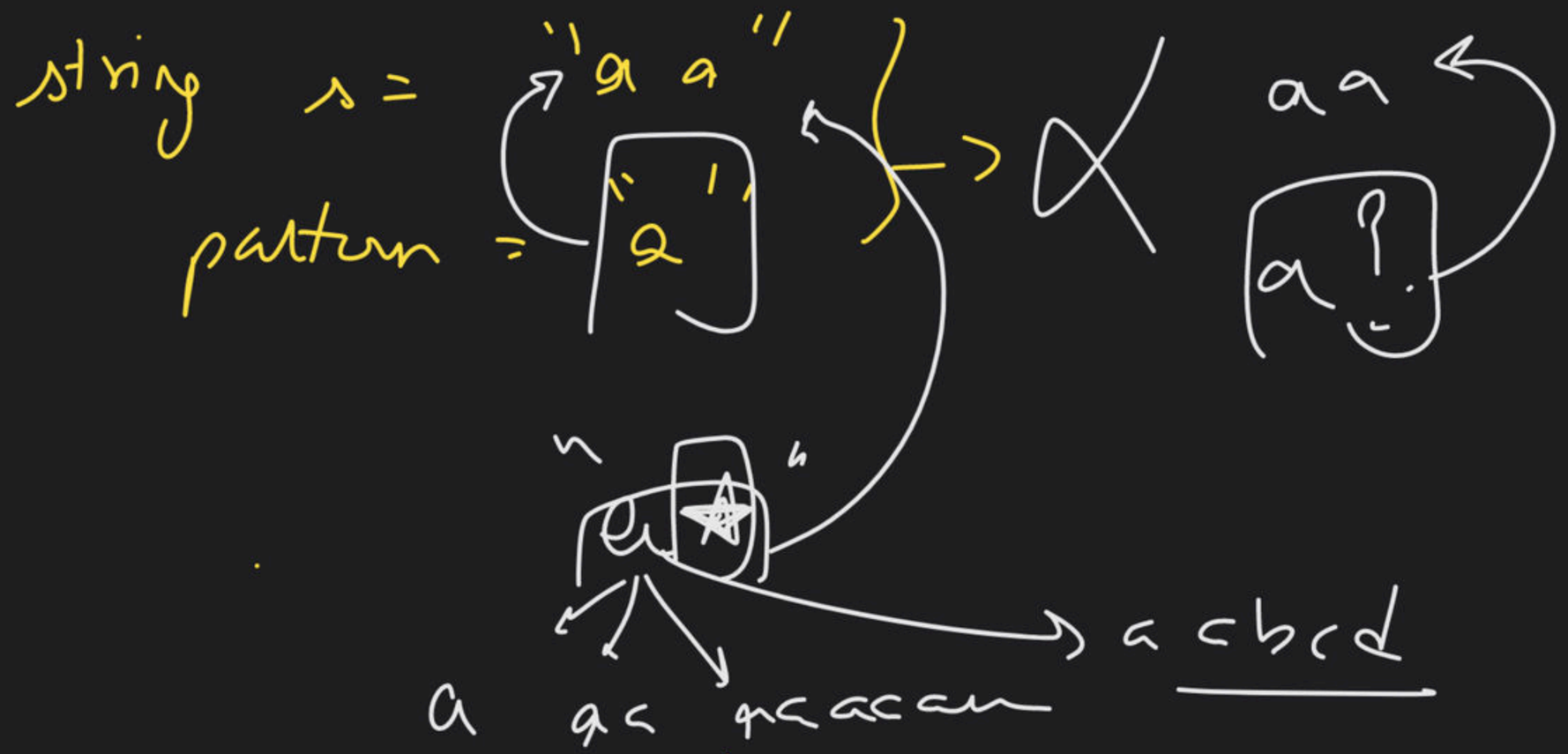
function :-

next_permutation

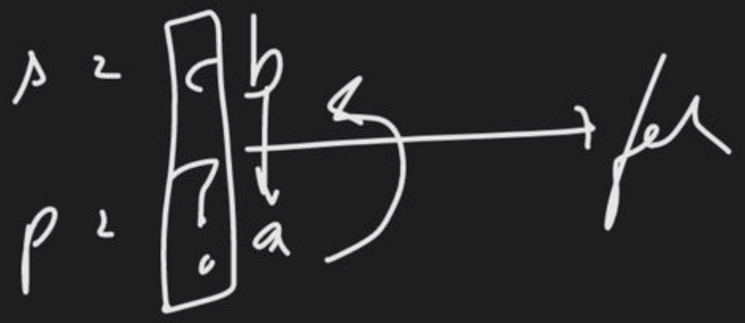
sol

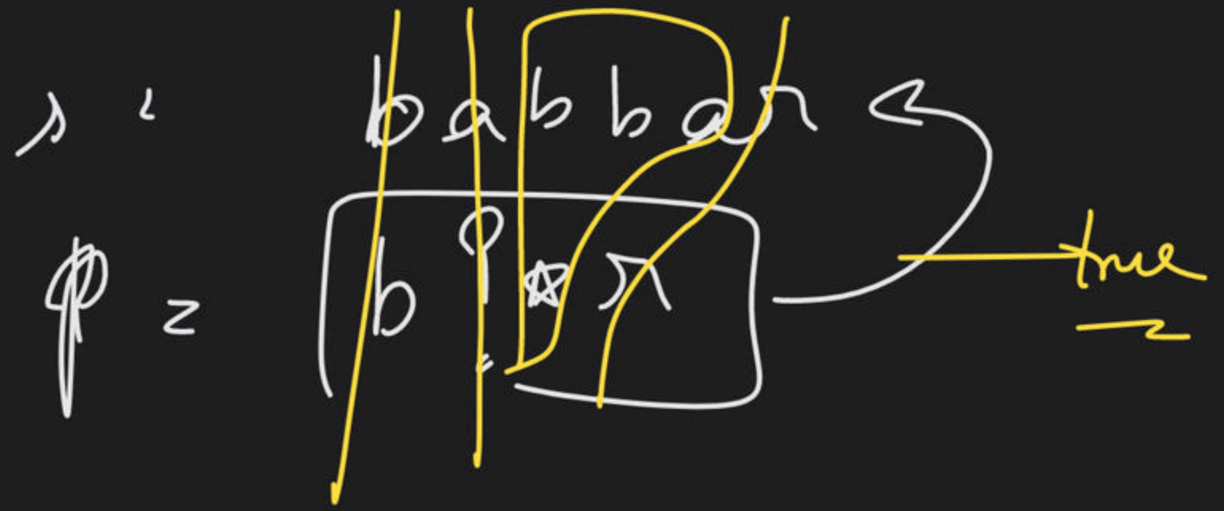

NASEK
{1, 2, 3}
123 , 132 , 213 , 231 , 312 , 321
n!
2!
K = 2
n! = 3! = 6


fact : fact

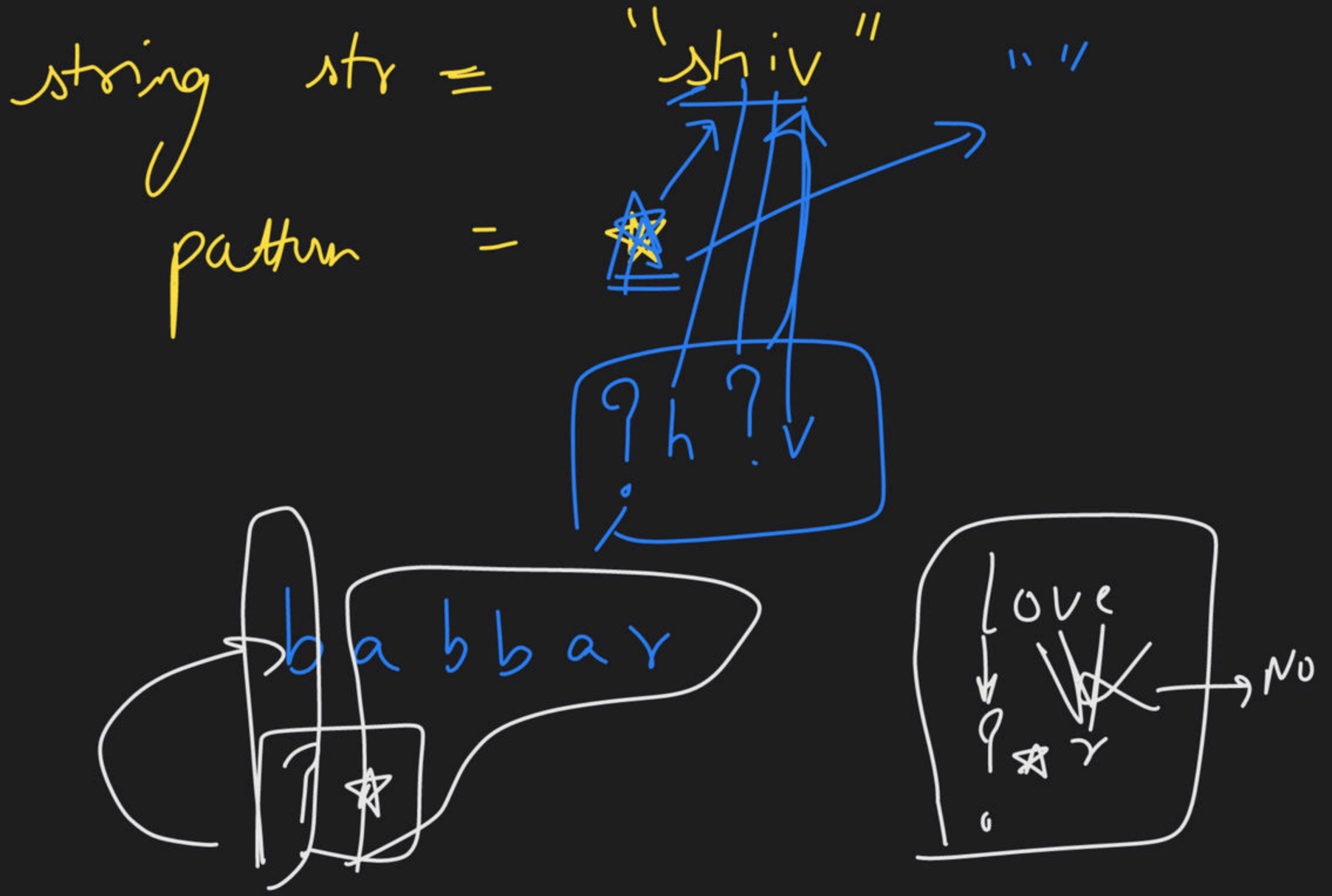

string s =
"a a"
pattern =
a
a a
a ?
a c b c d
a
a c
a c a c a c a


s = a c
p =
true


s =
p =
b
a
?
false



question clear →


string str = "shiv"
pattern =
?h?v
babbar
love
No

```
bool solve(i, j, pattern, str)
{
    if (i<0 && j<0)
        return true;

    if (i<0 && j>=0)
        return false;

    if (i>=0 && j<0)
    {
        for(int k=0; k<=i; k++)
            if (pattern(k) != '*')
                return false
    }
    return true;
```

str = babbar

pattern = a*r

str = babbar

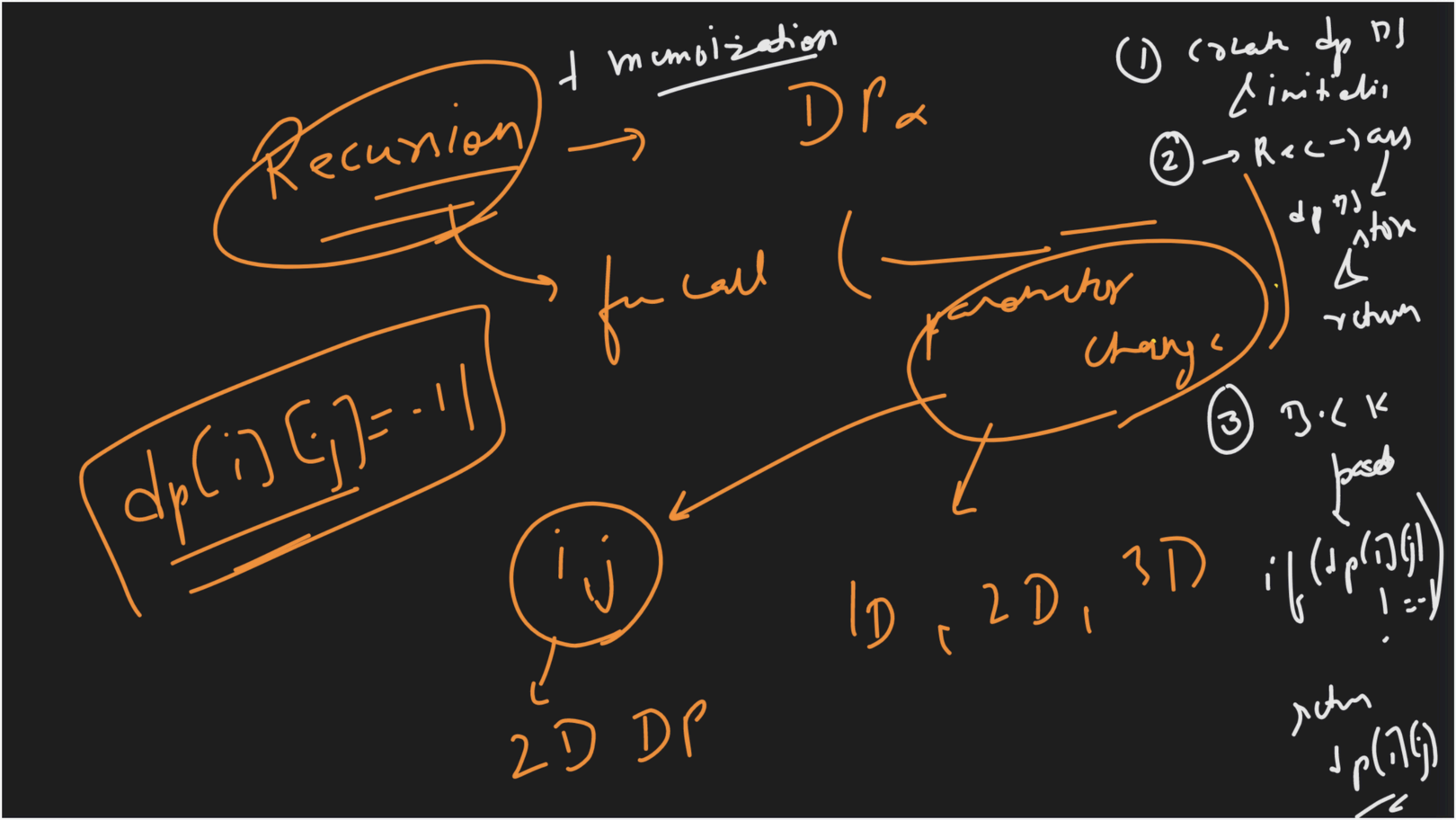
patt = *

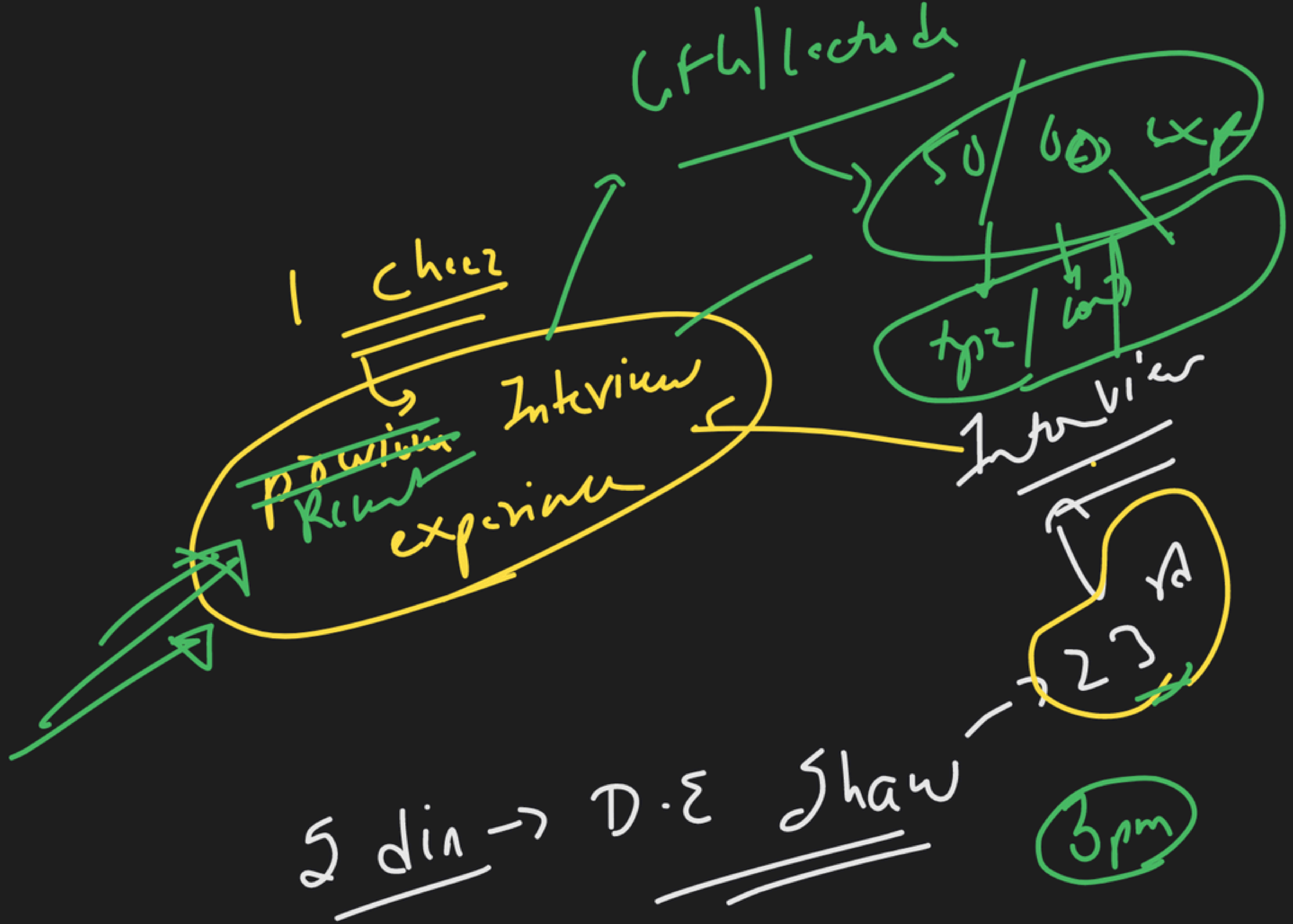
Surprise → Swiggy → 12

```
if (pattern[i] == str[j] || pattern[i] == '?')
    return solve(i-1, j-1, pattern, str);

else if (pattern[i] == '*')
    return (solve(i, j-1, pattern, str)
            or
            solve(i-1, j, pattern, str));

else return false;
```

"" '___'

start 10:45 pm


Recursion
+ memoization
DP
fun call
parameter change
dp[i][j] = -1
i j
2D DP
1D, 2D, 3D
① create dp arr
initialize
② → Rec → ans
dp arr
store
return
③ arr ≤ K
pass
if (dp[i][j] != -1)
return dp[i][j]


1 cheez
Interview
experience
Interview
23
2 din → D.E Shaw
3pm

Dhanya Waad

धन्यवाद