DnC Level-6

Special class

Love Babbar • Mar 26, 2023

→ Sudoku Solver

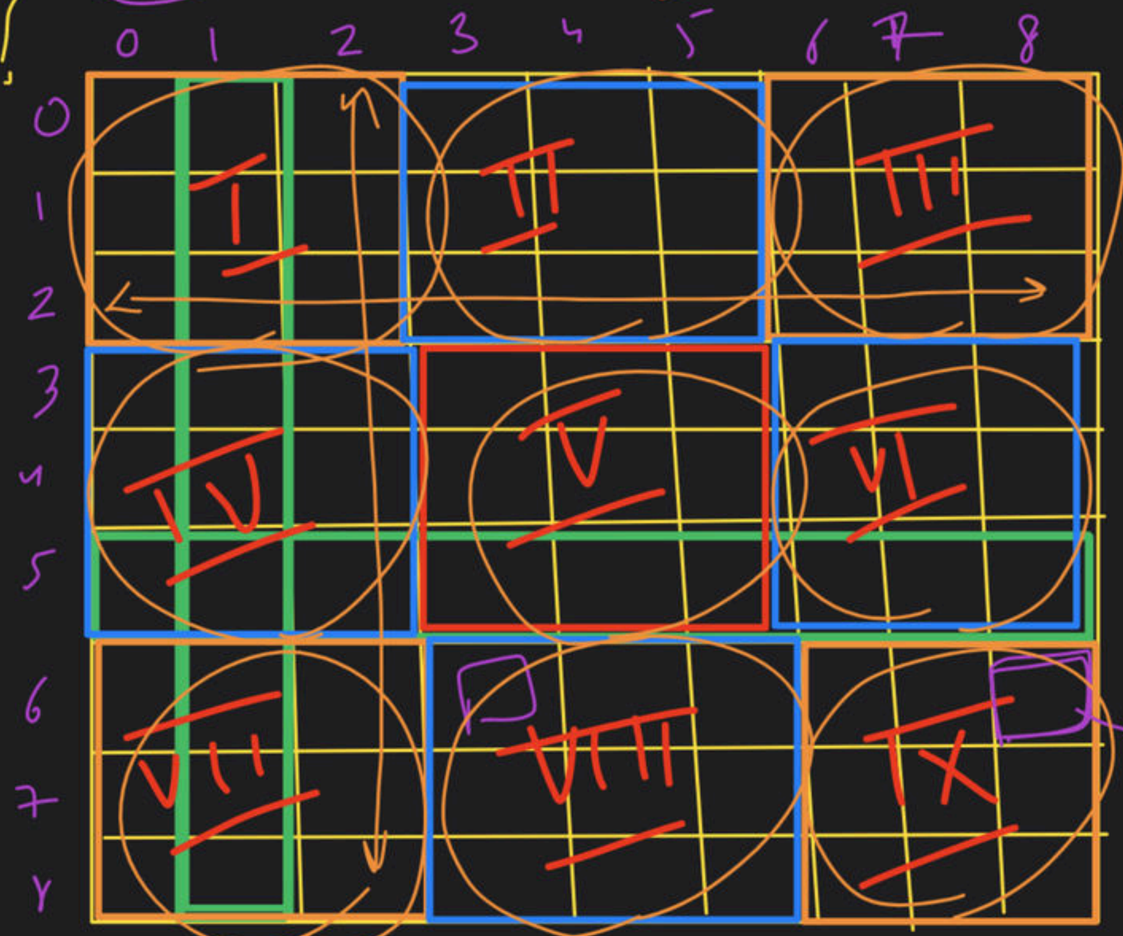
Problem Statement

9 x 9

1 - 9

9 x 9

?



1 → 9

no repeatation

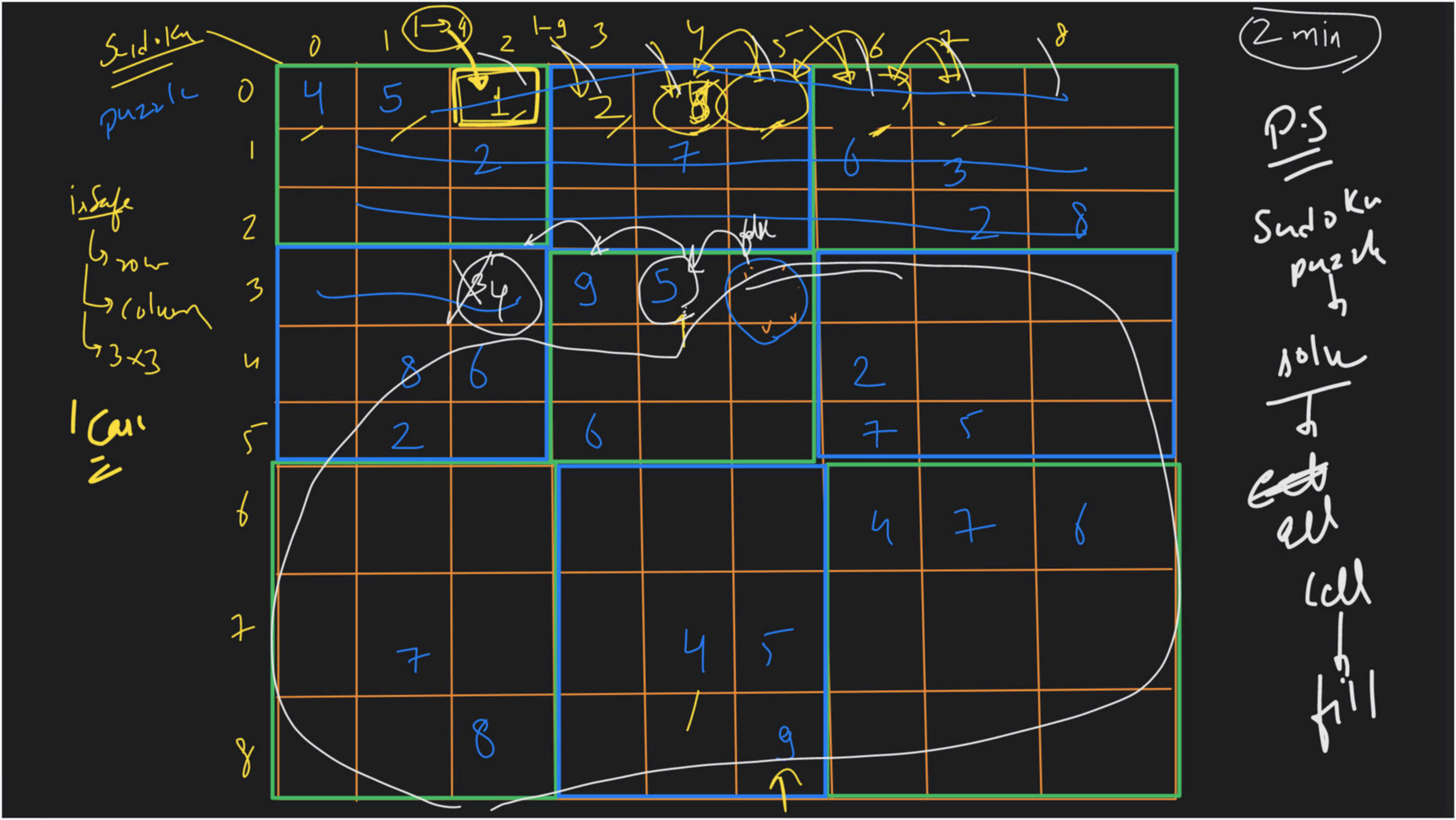
(A) Each column → 1-9

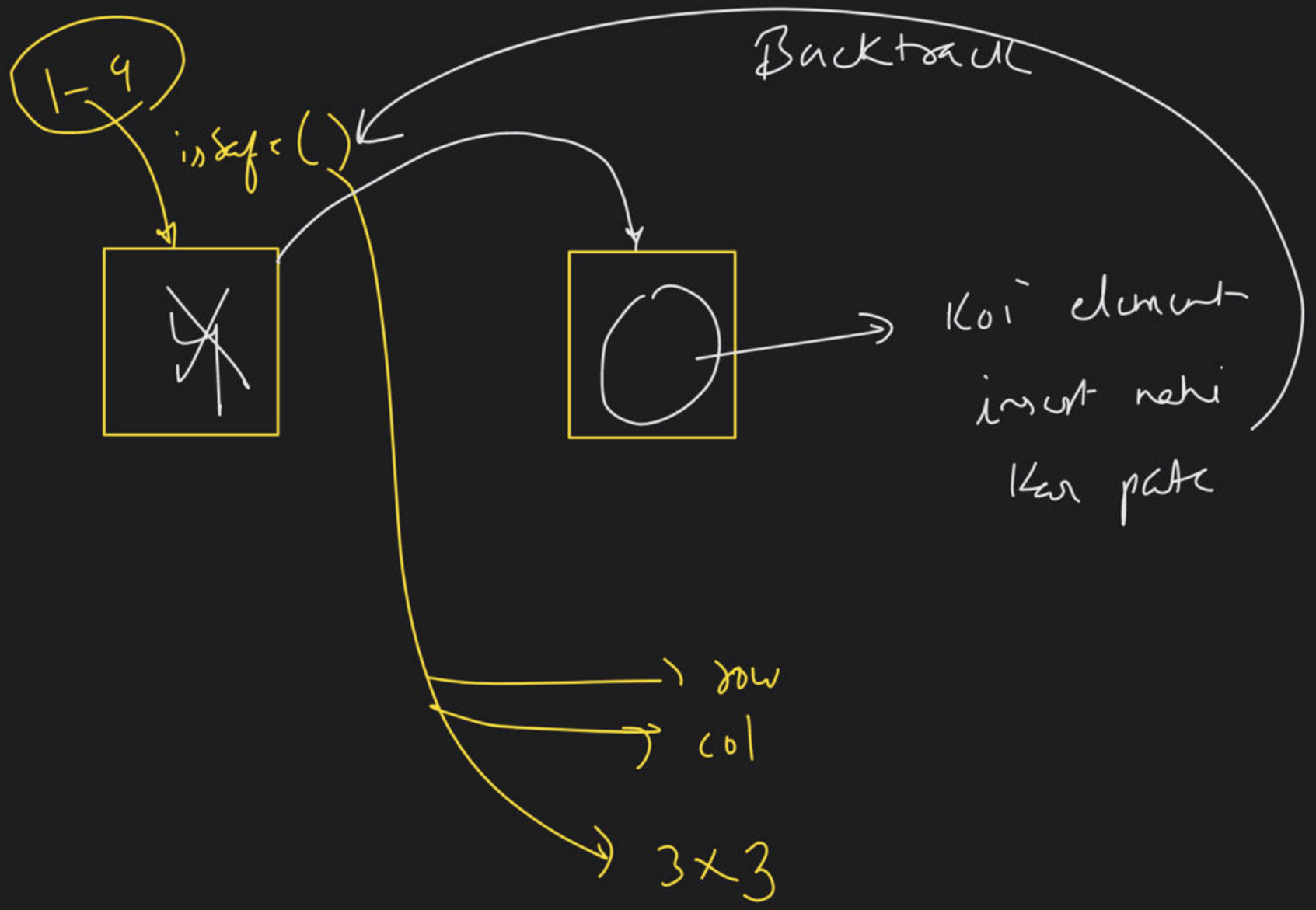
(B) Each Row → 1 - 9

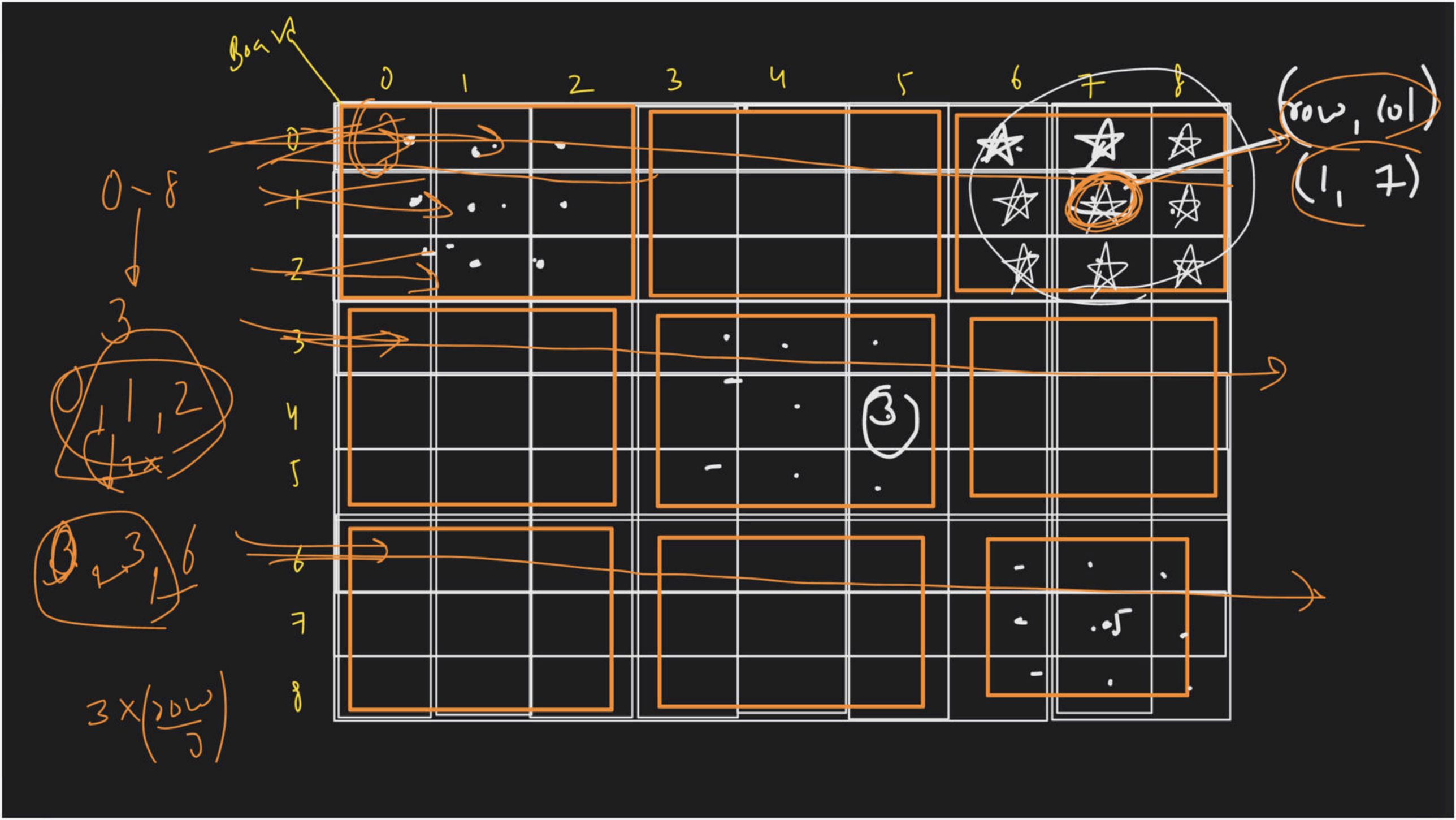
3x3 Box

1 → 9

1 → 9


Sudoku
puzzle
0 1 2 3 4 5 6 7 8
1-9
1-9
isSafe
row
column
3×3
1 Call
2 min
P.S
Sudoku puzzle
soln
cell
cell
fill


1-9
isSafe()
Backtrack
Koi element insert nahi kar pate
row
col
3x3


Board
0 1 2 3 4 5 6 7 8
0 1 2 3 4 5 6 7 8
(row, col)
(1, 7)
0 - 8
3
0, 1, 2
0, 3, 6
3 × (row / 3)

$i = 6$

$$3 \times \left(\frac{1}{3}\right) + \frac{6}{3} = 2$$

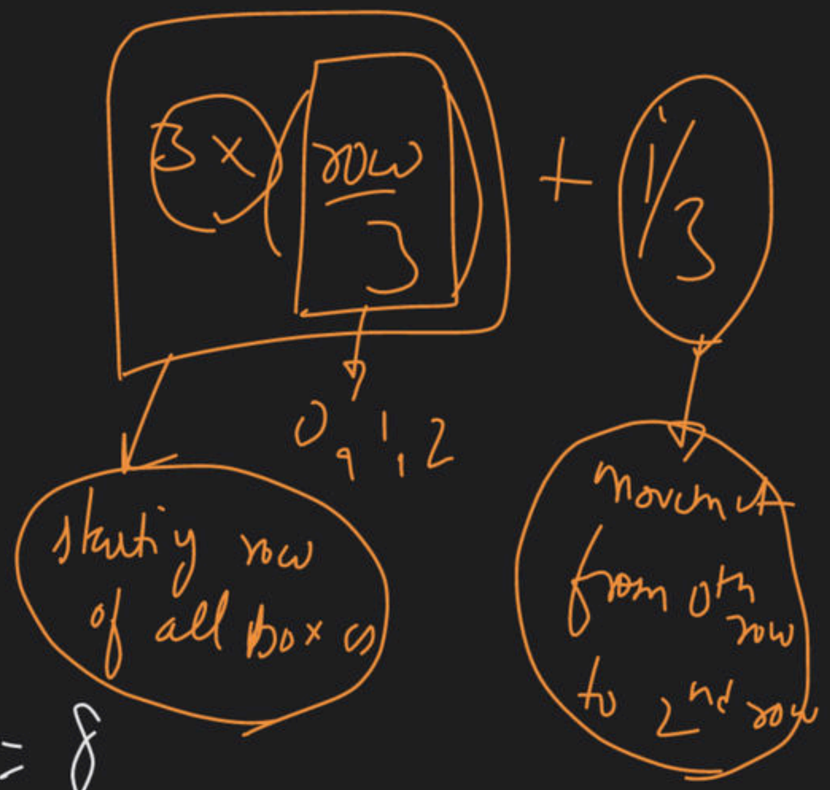
$$3 \times \left(\frac{7}{3}\right) + 6/3 = 6$$

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

starting row of all boxes

0, 1, 2

movement from 0th row to 2nd row



$i = 7$

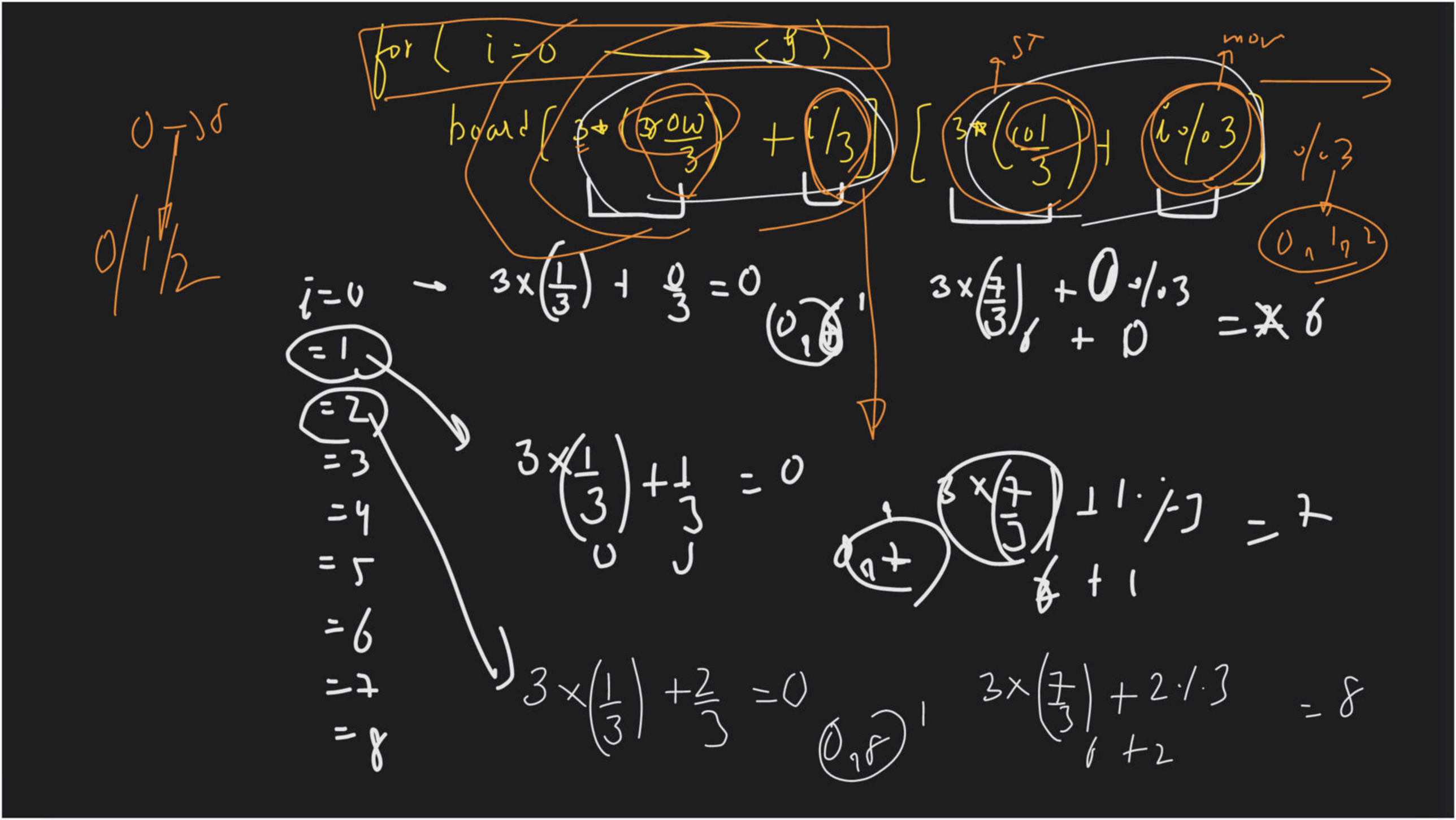
$$3 \times \left(\frac{1}{3}\right) + \frac{7}{3} = 2$$

$$3 \times \left(\frac{7}{3}\right) + 7/3 = 7$$

$i = 8$

$$3 \times \left(\frac{1}{3}\right) + \frac{8}{3} = 2$$

$$3 \times \left(\frac{7}{3}\right) + 8/3 = 8$$


for (i=0 → <9)
board [3*(row/3) + i/3] [3*(col/3) + i%3]
ST
mov
0→8
0/1/2
i=0 → 3x(1/3) + 0/3 = 0
(0,1)
3x(1/3) + 0%3
+ 0 = 6
i=1
i=2
=3
=4
=5
=6
=7
=8
3x(1/3) + 1/3 = 0
0 0
3x(2/3) + 1%3 = 7
+1
3x(1/3) + 2/3 = 0
(0,8)
3x(2/3) + 2%3 = 8
+2

row = 1 ✓

col = 7 ✓

$3 \times \left(\frac{row}{3}\right) + \left(\frac{i}{3}\right)$, $3 \times \left(\frac{col}{3}\right) + i \% 3$

$i = 5$

$\frac{1}{3} = 0$

$\frac{5}{3} = 1$

$\frac{7}{3}$

$3 \times \left(\frac{1}{3}\right) + \left(\frac{5}{3}\right)$, $3 \times \left(\frac{7}{3}\right) + 5 \% 3$

$3 \times 0 + 1$

$= 0 + 1$

$= 1$

$3 \times 2 + 2$

$6 + 2$

$= 8$

$3 \overline{)5}$

$\underline{\underline{2}}$

$\underline{\underline{(1, 8)}}$

$i=3$

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

$3\times\left(\frac{7}{3}\right)+3\frac{1}{3}=6$

$i=4$

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

$3\times\left(\frac{7}{3}\right)+4\frac{1}{3}=7$

$i=5$

$3\times\left(\frac{1}{3}\right)+\frac{5}{3}=1$

$3\times\left(\frac{7}{3}\right)+5\frac{1}{3}=8$