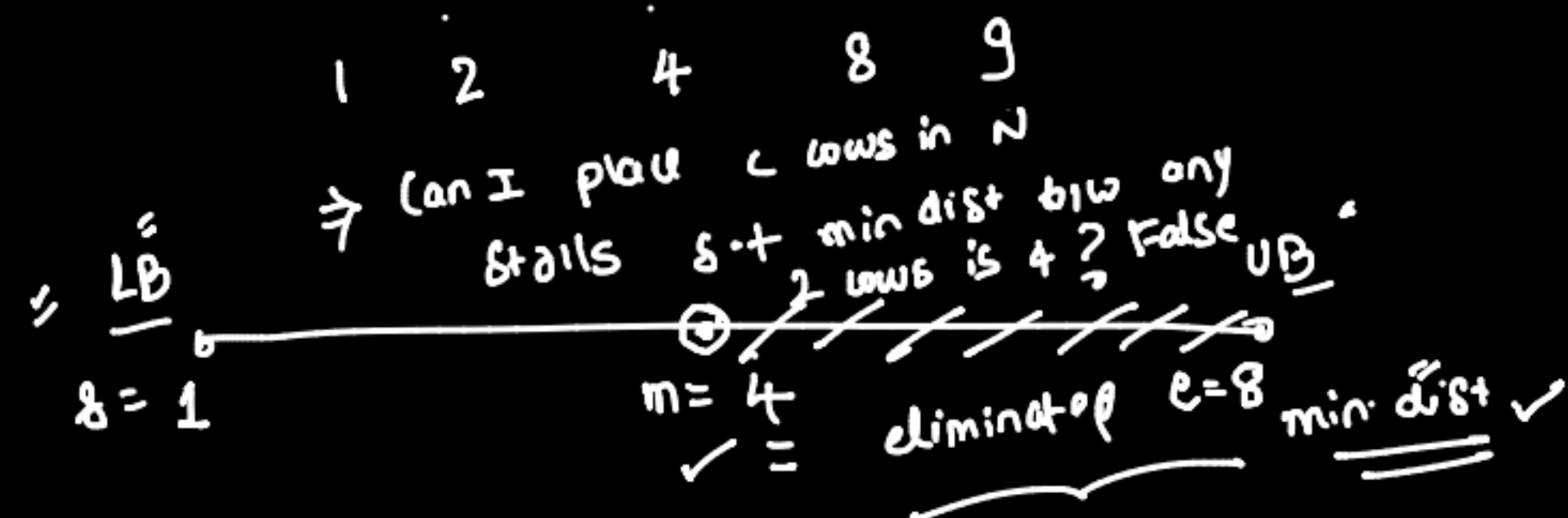


Binary Search - monotonic

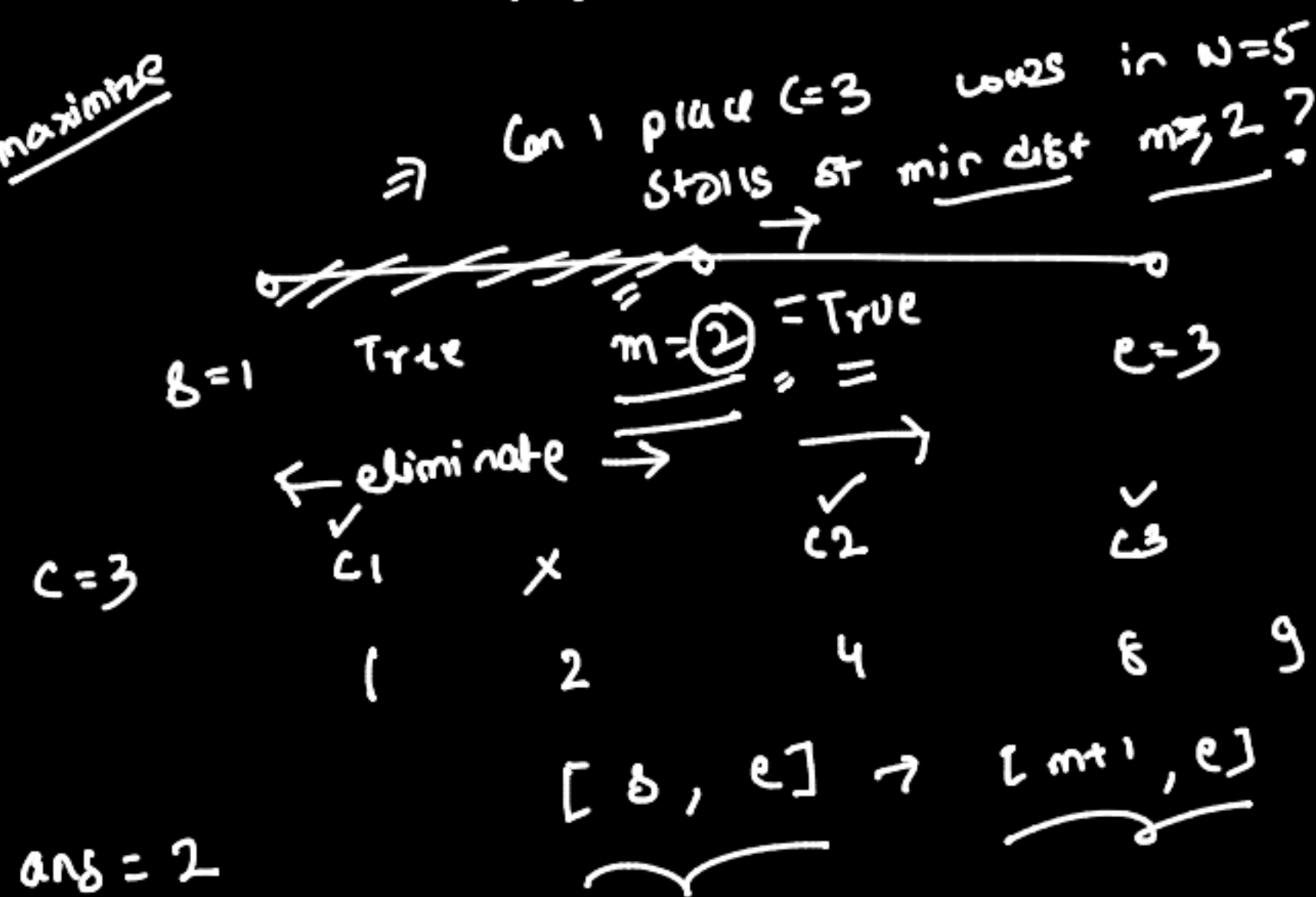
min. dist \Rightarrow Search space $C=3$



$[s, e] \rightarrow [s, m-1]$

$[1, 8] \rightarrow [1, 3]$

maximize



can I place C cows in N stalls
 $s=3$ $m=3$ True $e=3$ \Rightarrow min dist \checkmark

$[1, 3] \rightarrow [3, 3]$

is ≥ 3 ? \Rightarrow

c_1 x c_2 c_3

1 2 4 5 9

$\text{ans} = \text{True}$ $\text{ans} = 3$ \checkmark

$[s, e] \rightarrow [m+1, e]$

$[3, 3] \rightarrow [4, 3]$

$s > e \therefore \text{stop}$

monotonic f_n

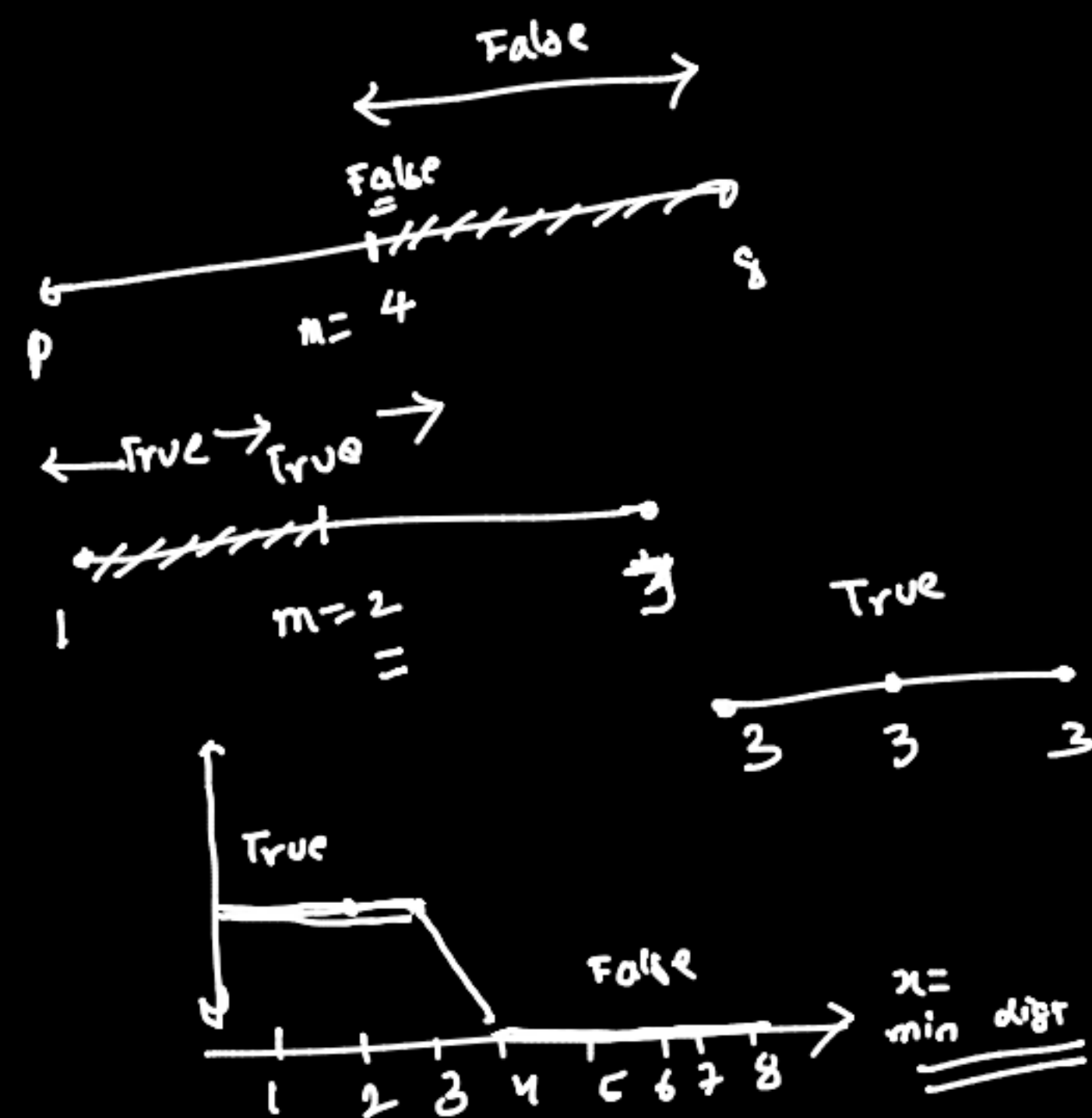
\hookrightarrow non-dec $\Rightarrow \uparrow = \text{True}$

\hookrightarrow non-inc $\Rightarrow \downarrow = \text{True}$

$x_1 < x_2$
 $f(x_1) \geq f(x_2)$

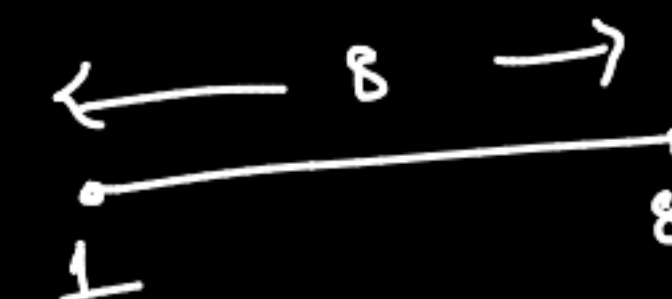


min-dist



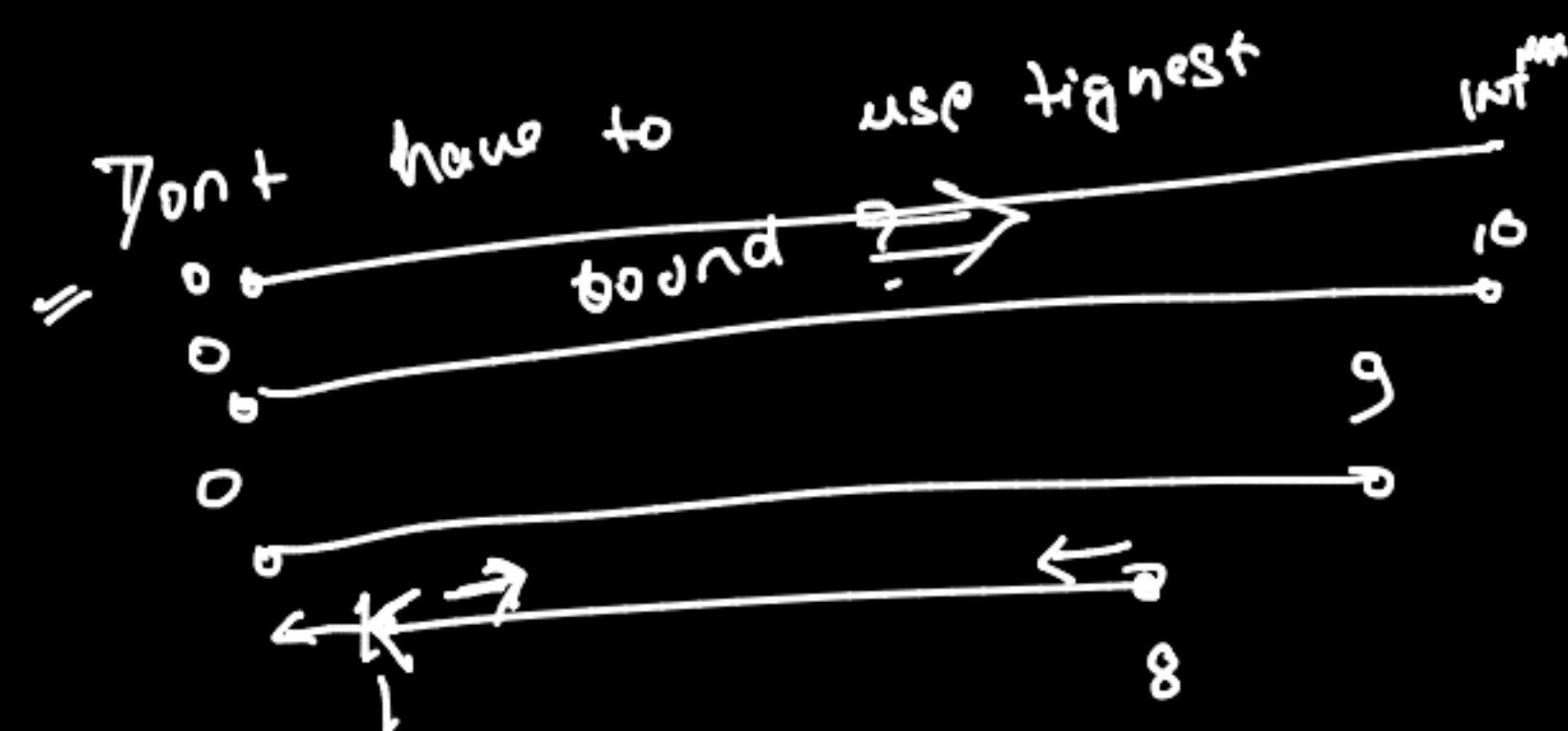
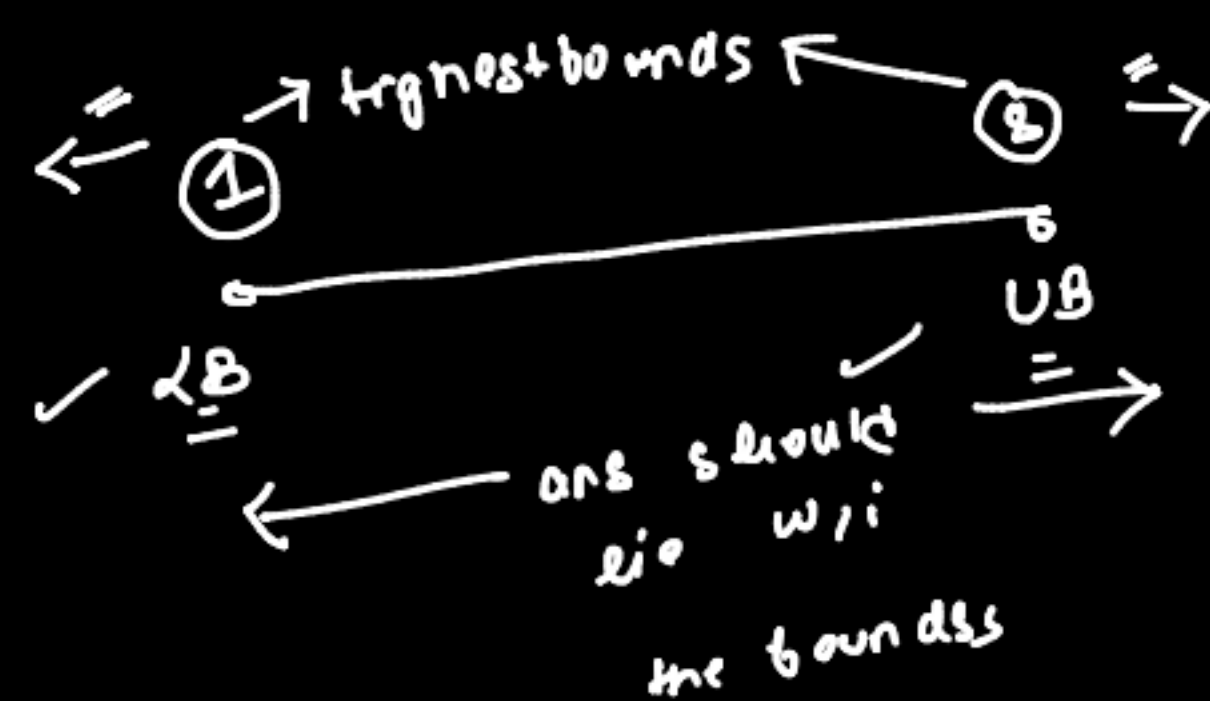
yes

$$\Rightarrow \log_2 n \Rightarrow \log_2 8 = 3 = \text{steps}$$



$$\log_2^{32} = 32 \text{ steps}$$

2.



8.2 p8

K painters
N boards

$$\max_{i=1 \dots LB} (B_i)$$

you assign $N = K$
painters to
paint N
boards

100 \Rightarrow sum of lengths based

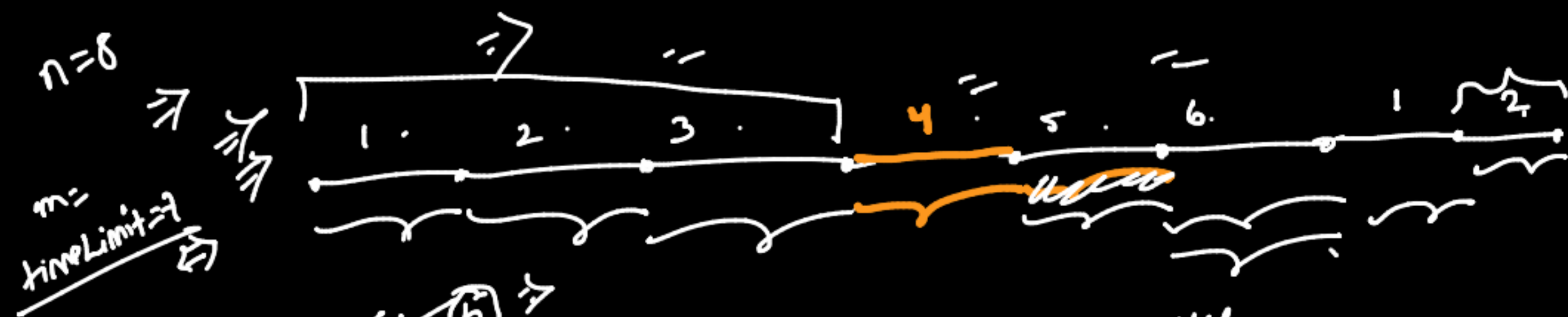


when you assign
only 1 pointer to
point
2 boxes

→ [10 20 20 40]

$$10 + 20 + 30 + 40 = 100$$

$$\Rightarrow \begin{bmatrix} 10 & 20 & 30 & 40 \end{bmatrix} \begin{matrix} p_1 \\ p_2 \\ p_3 \\ p_4 \end{matrix}$$



= ~~1~~ ~~2~~ ~~3~~ ~~4~~ ~~5~~ ~~6~~ ~~7~~ ~~8~~

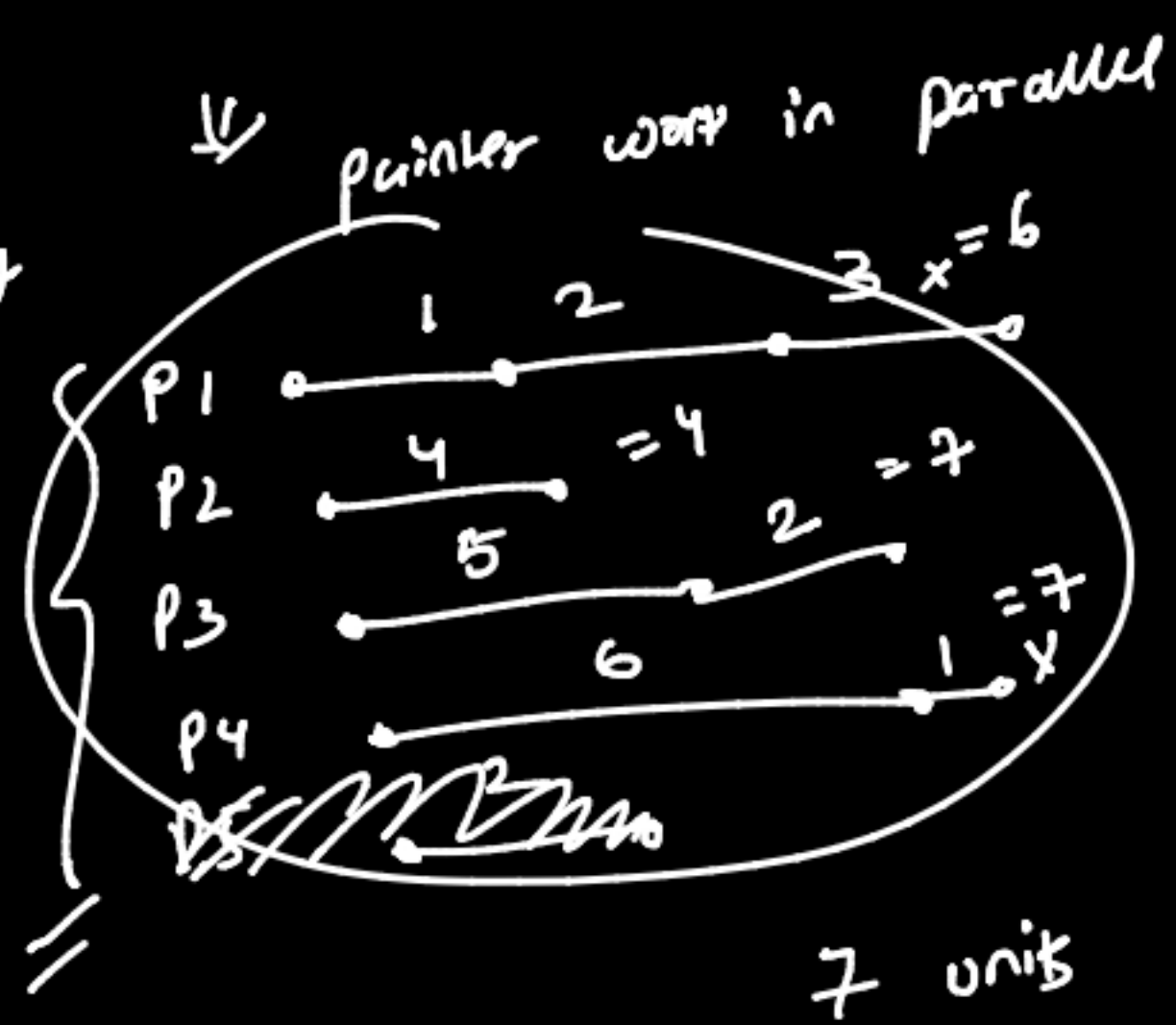
time = ~~0~~ ~~1~~ ~~3~~ ~~6~~ ~~10~~ ~~7~~ ~~7~~

time = ~~4~~ ~~9~~ ~~7~~

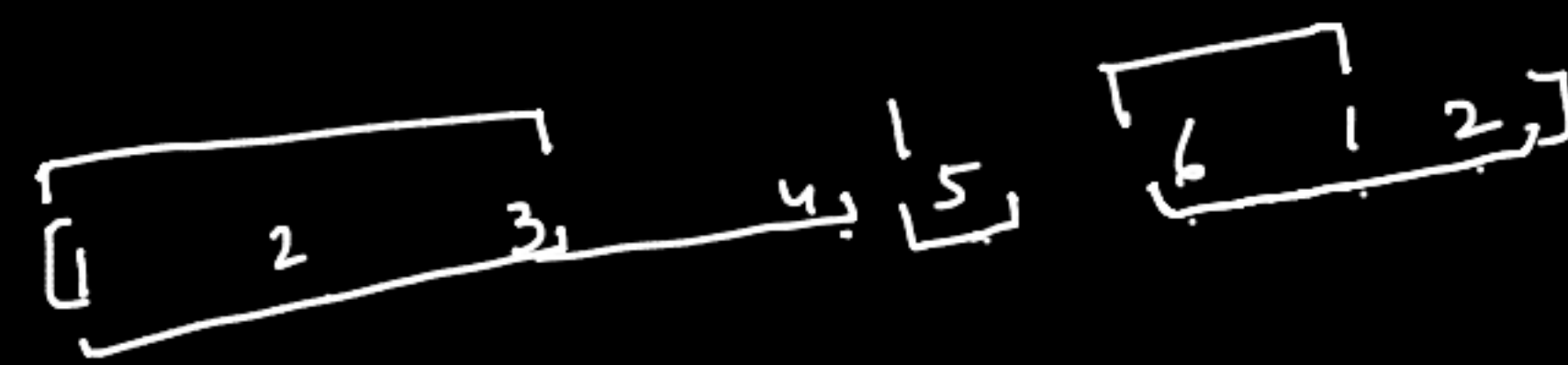
time = ~~5~~ ~~11~~ ~~7~~ ~~7~~

time = ~~8~~ ~~7~~ ~~9~~ ~~7~~ ~~7~~

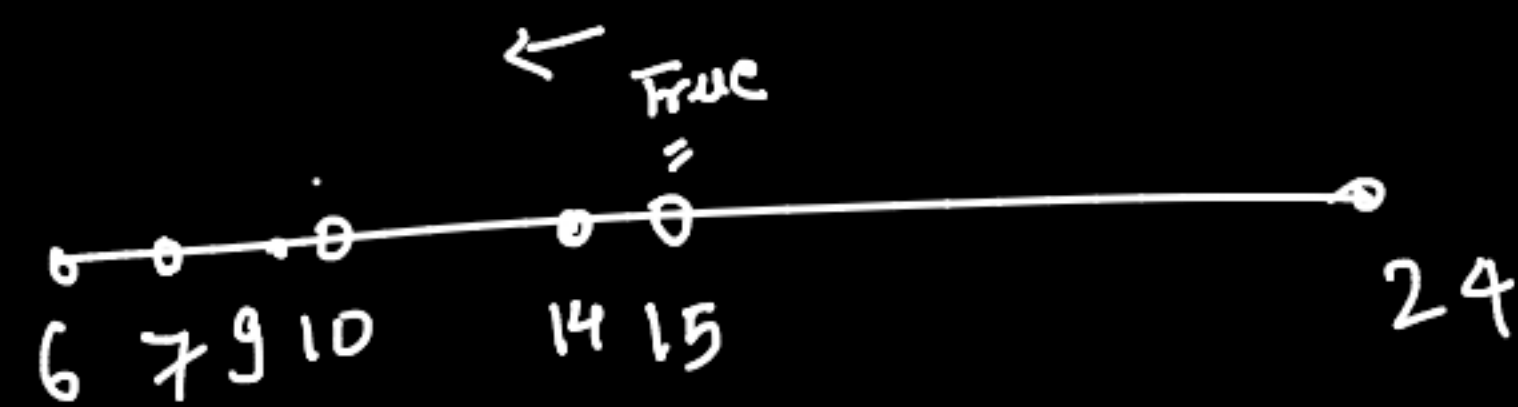
time = 2



$K=4$ $5 \leq 4$



$K=4$



$$\frac{9+6}{2} = \frac{15}{2} = 7$$

Roti Prata = P
 = L
 = R

$L_i \rightarrow r \Rightarrow r, 2r, 3r, \dots$
 true
 ↓
 more left
 min time reqd.
time

LB UB

To cook P
 prates by
 L cooks
 what min
 time?
 assign 1
 look for
 each prate

To cook time
 P prates by
 L cooks
 what max
 time?
 assign a single
 cook to compli
 me order