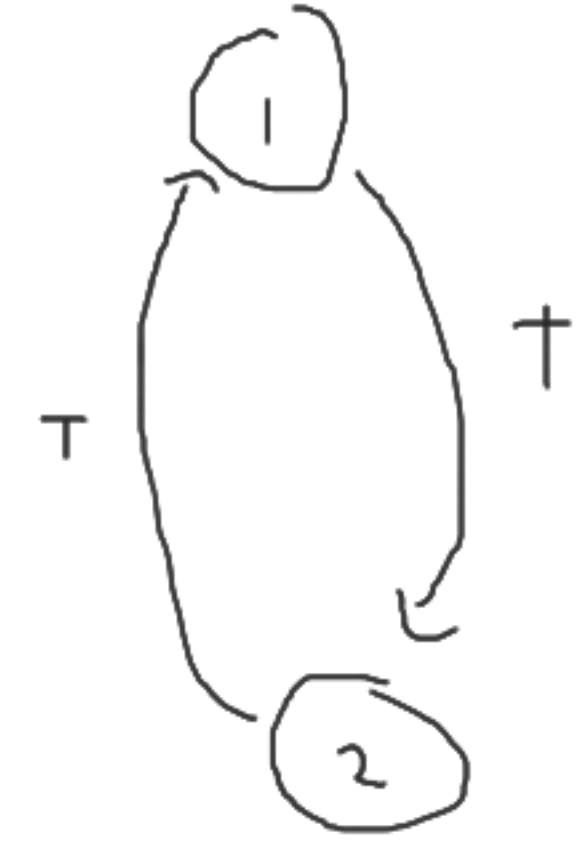


#	4	6	3	4	3
5	10	15	5	9	6

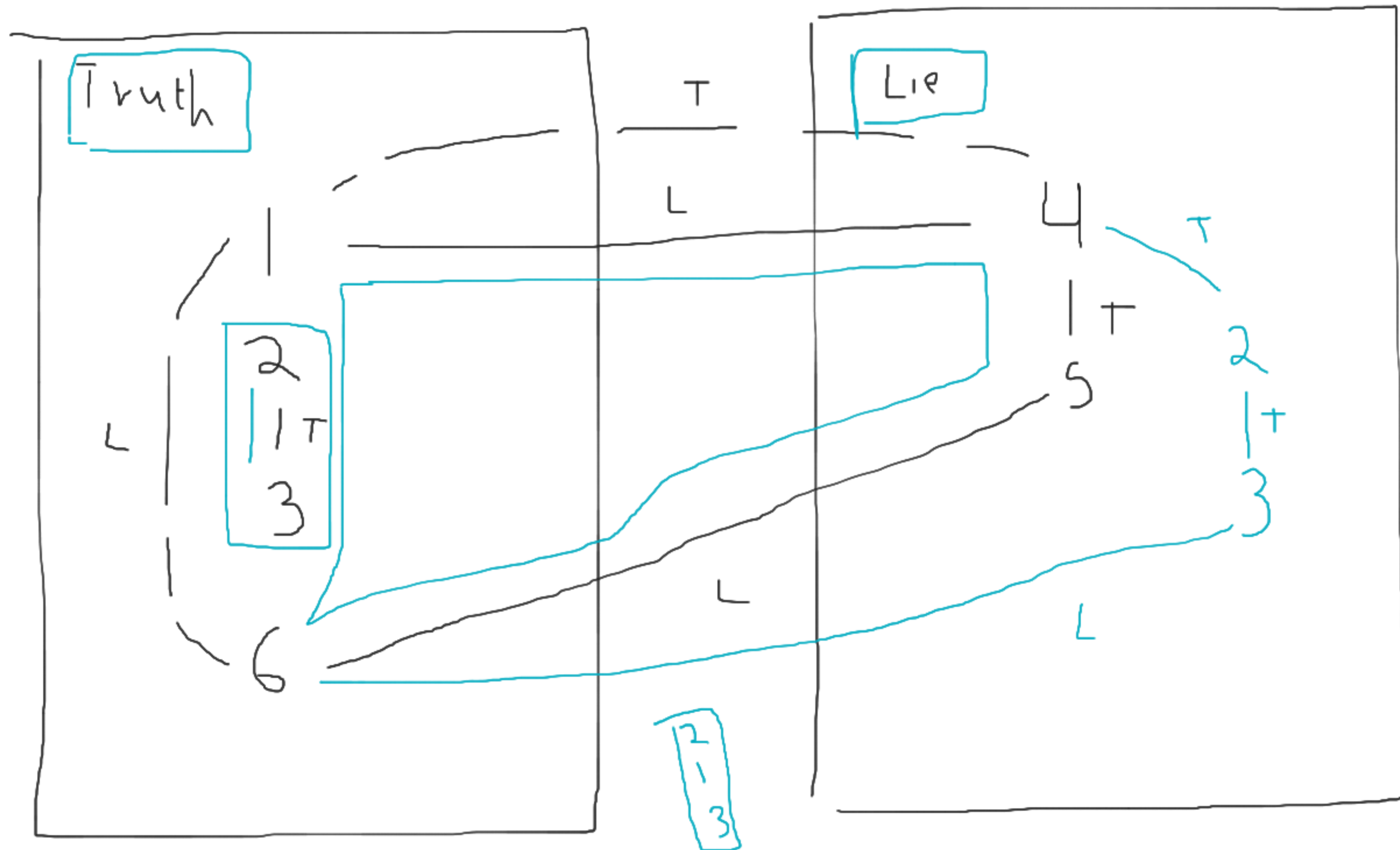
Diagram illustrating a data structure with two rows. The first row contains values 4, 6, 3, 4, 3. The second row contains values 10, 15, 5, 9, 6. A blue box highlights the subarray [3, 4, 3] in the first row and [5, 9, 6] in the second row. A green bracket above the first row spans from index 4 to index 6. A green bracket below the first row spans from index 3 to index 6. A green arrow points from the first row to the second row at index 4. A green arrow points from the first row to the second row at index 5. A green arrow points from the first row to the second row at index 6.



x y T/L



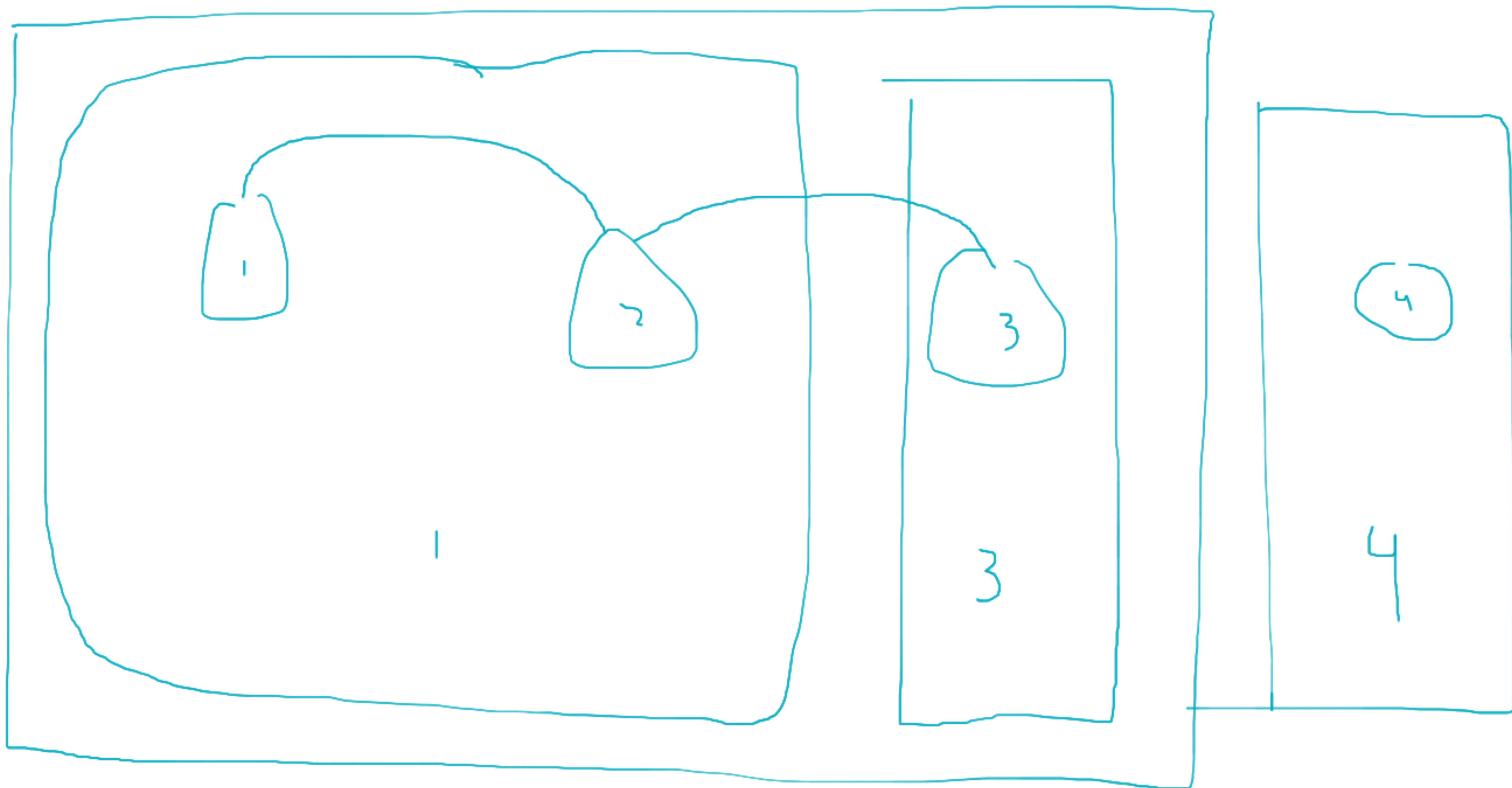
Break: 3:00 - 3:15



4 5 T

5 6 L

4 1 T



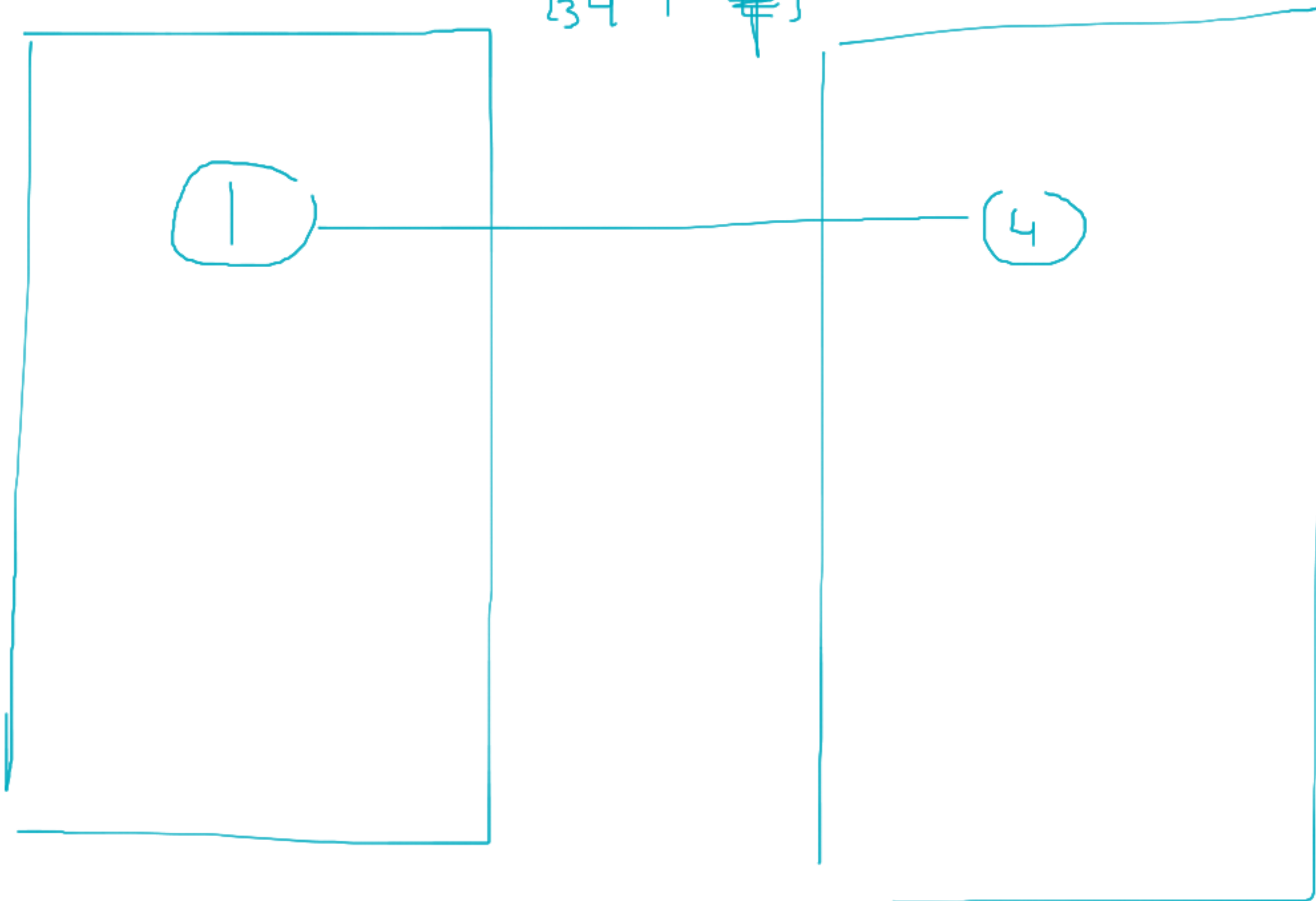
2

L

3

$$\begin{array}{ccc}
 1 & 4 & L \\
 2 & 3 & T \\
 \hline
 4 & 1 & T
 \end{array}$$

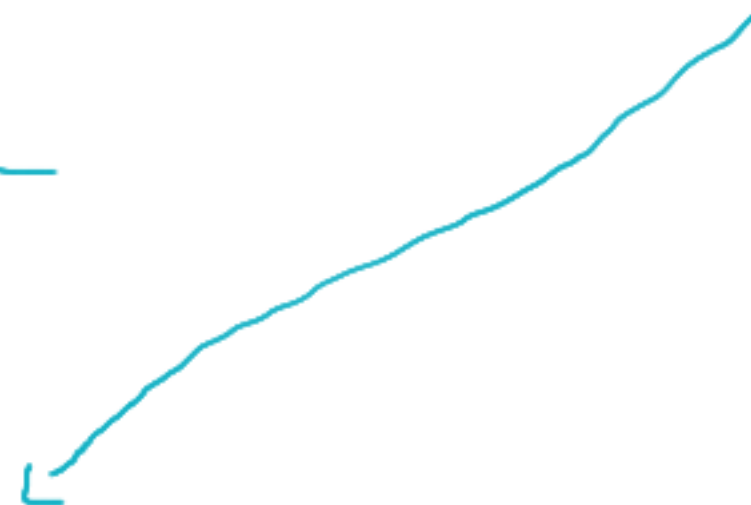
$$\begin{array}{cccc}
 1 & 1 & 4 & L \\
 \hline
 3 & 4 & 1 & \#
 \end{array}$$



1 4 L

[ 1 1 4 L ]

~~2~~ ~~4~~



[ 2 4 5 ]  
[ 3 1 4 L ]

4

\_\_\_\_\_

L  
X  
6

1

5

[ 2 4 5 7 ]  
[ 3 5 6 L ]

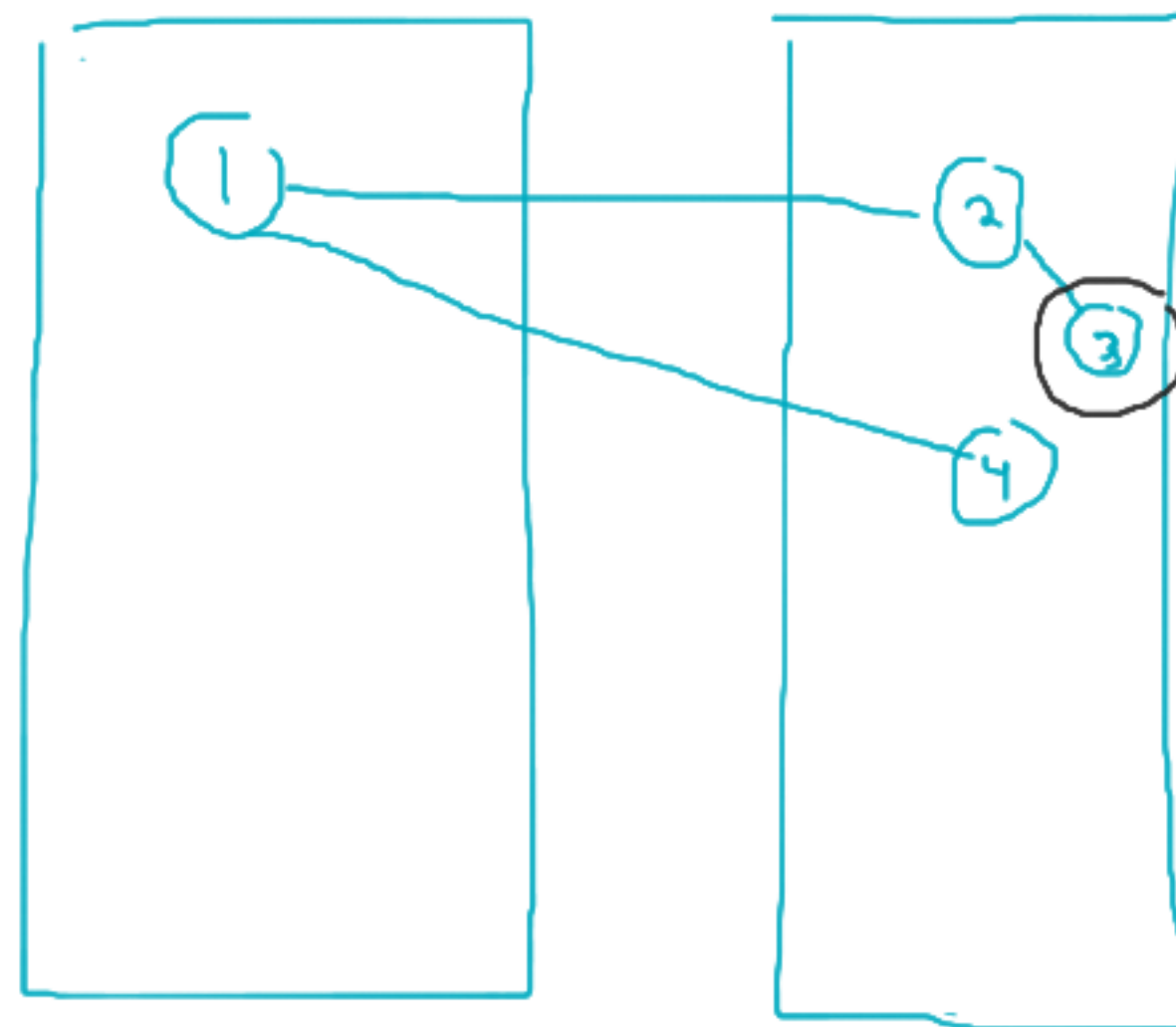
$O(n \log n)$



1	3	4	L
2	1	2	L
<hr/>			
3	2	3	T
<hr/>			
4	4	1	L
<hr/>			

1	2	3	4
$\begin{bmatrix} 2 & 1 & 2 & L \\ 4 & 1 & 4 & L \end{bmatrix}$	$\begin{bmatrix} 1 & 2 & 1 & L \\ 3 & 2 & 3 & T \end{bmatrix}$	$\begin{bmatrix} 1 & 3 & 4 & L \\ 3 & 3 & 2 & T \end{bmatrix}$	$\begin{bmatrix} 1 & 4 & 3 & L \\ 4 & 4 & 1 & T \end{bmatrix}$

A = 4



$N$   $0 \leq N \leq 10^6$

$1 \rightarrow 0$

YES

⋮

$9 \rightarrow 0$

YES

$195 \rightarrow 190$

$10 \rightarrow 9 \rightarrow 0$  No

$20 \rightarrow 18 \rightarrow 10$

$30 \rightarrow 27 \rightarrow 20$

0

NO

1  
:  
:  
:  
9

for any  $i$ :

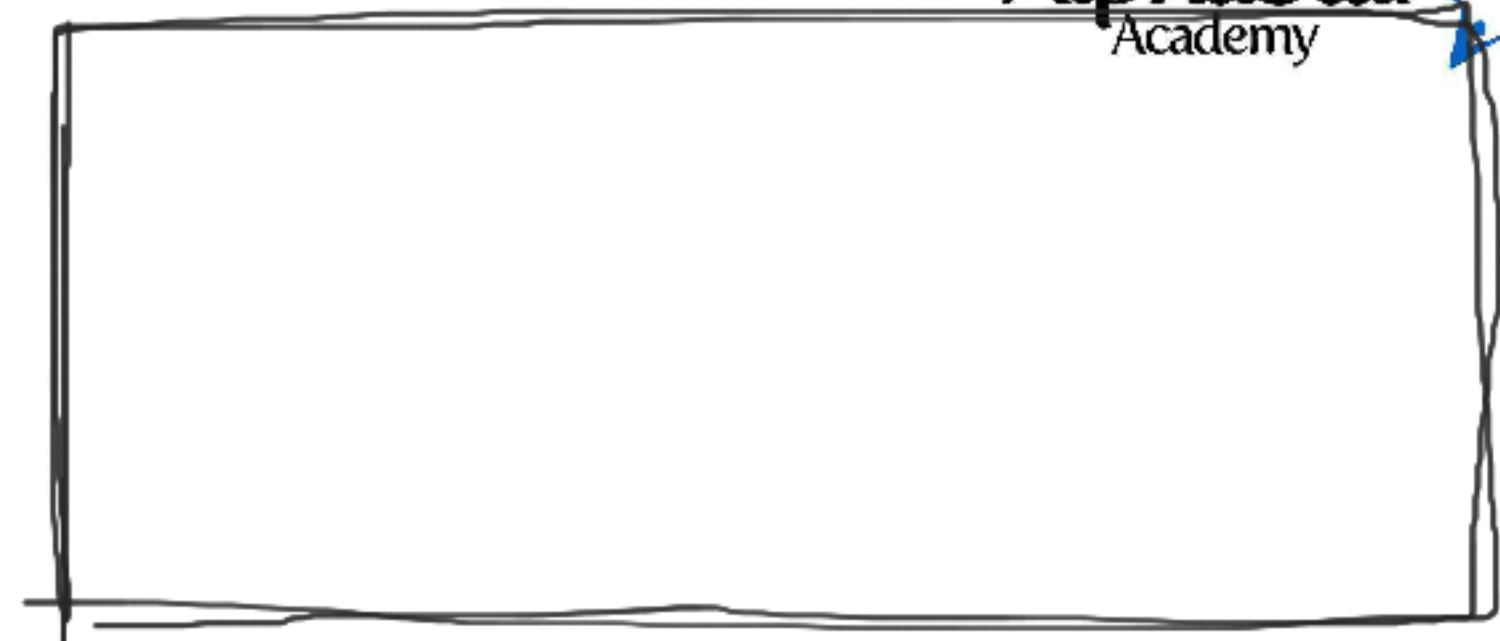
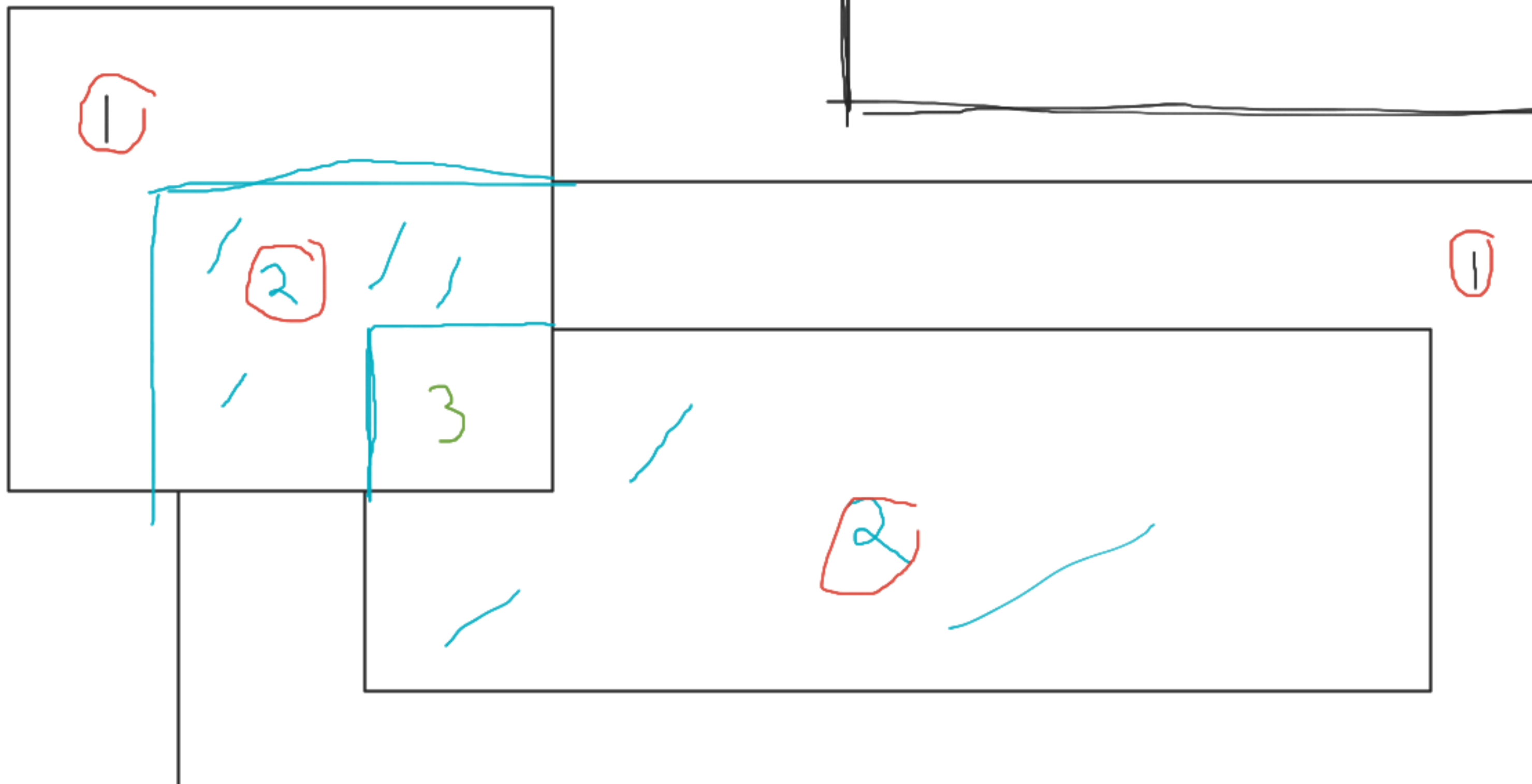
$top, bot = \text{largest, smallest digit}$

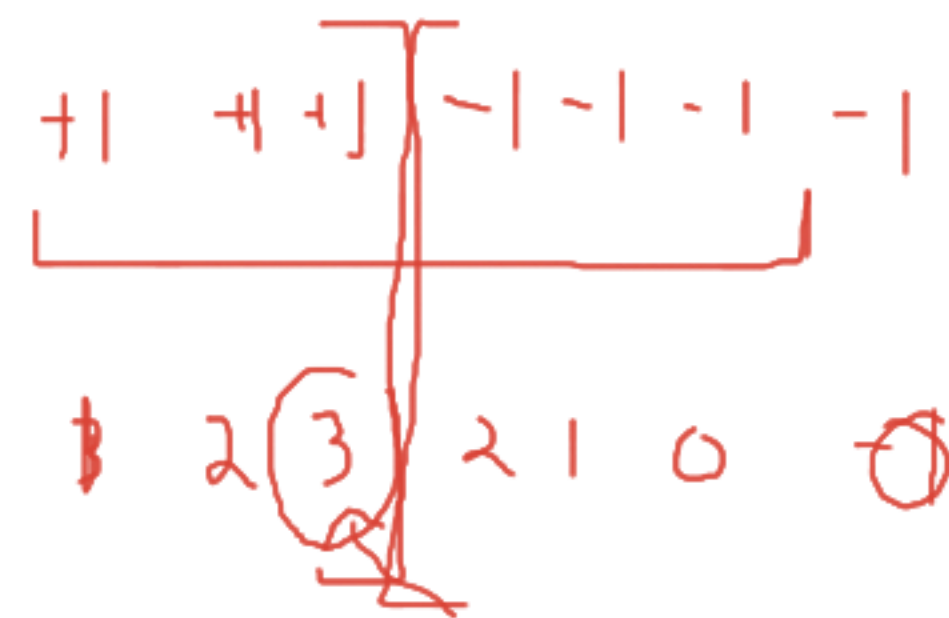
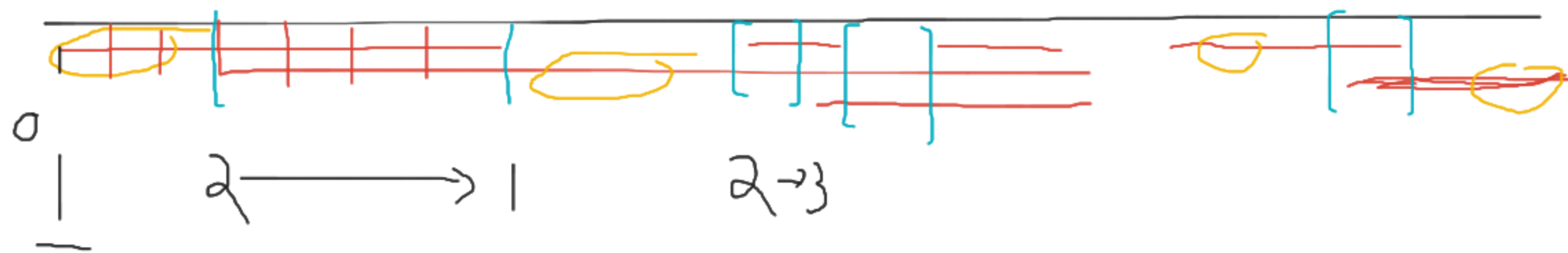
→

$dp[i] = !dp[i - top]$

~~dp~~  $! dp[i - bot]$

Runtime:  $O(N)$





+1    +1, -1, -1, +1, -1, -1

0	1	2	1	0	1	<del>2</del>	<del>0</del>
0	(1)	(2)	2	2	2	2	2
	2	1	0	0	1	0	<del>0</del>
	2	(1)	0	0	1	0	0