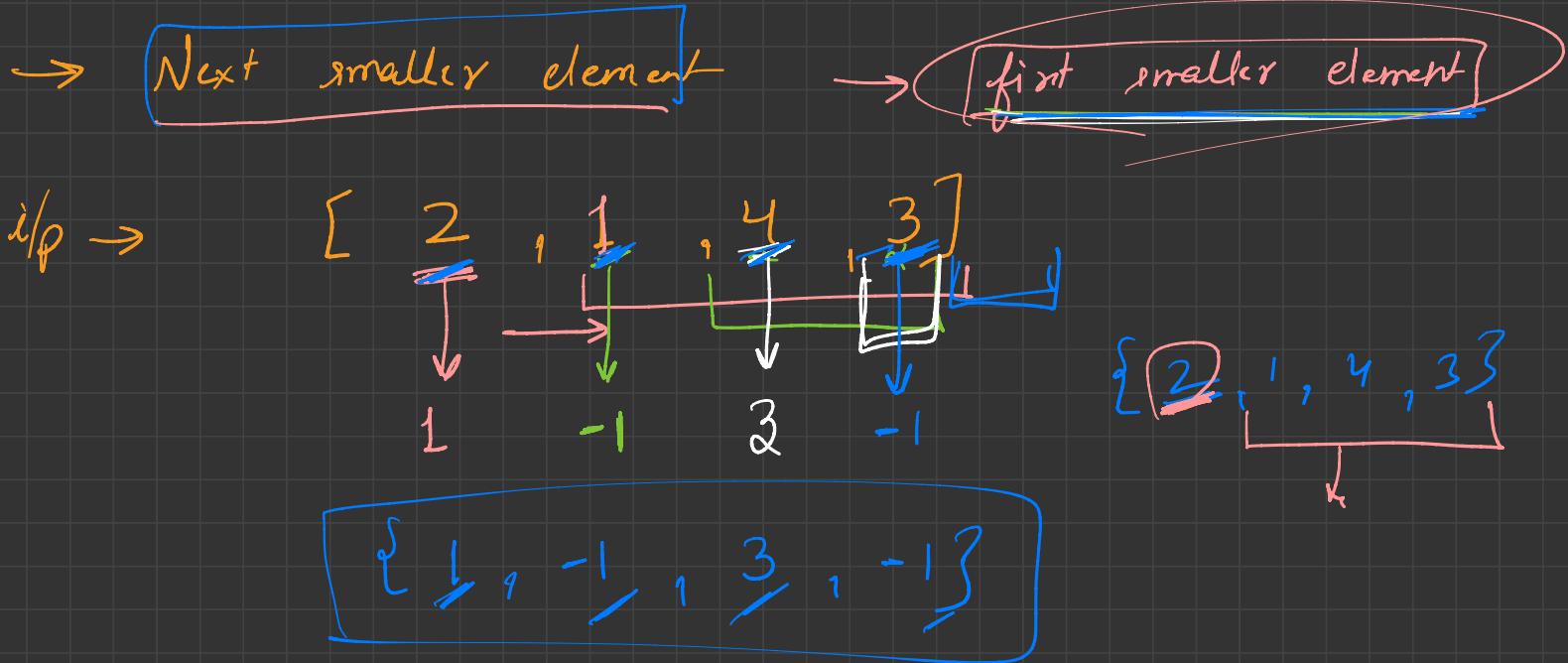
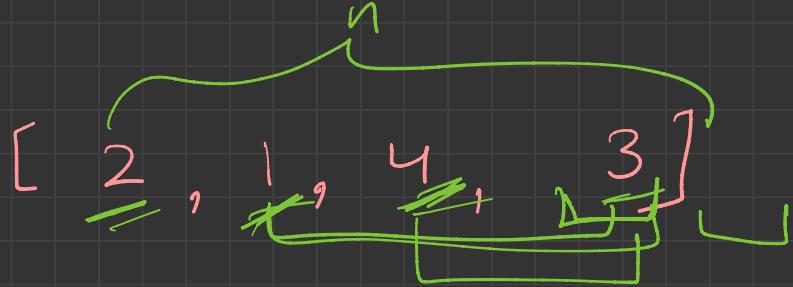



Stack



Approach:-



$$2 \rightarrow \{1, 4, 3\} \rightarrow (n-1) \rightarrow 3$$

$$1 \rightarrow \{4, 3\} \rightarrow (n-2) \rightarrow 2$$

$$4 \rightarrow \{3\} \rightarrow 1$$

$$3 \rightarrow \{3\} \rightarrow 0$$

$$T.C \rightarrow O(n^2)$$

$\text{foo} (\text{ int } i = 0, < n)$

{
 $\text{for } (\text{ int } j = i+1, < n)$

{
 }
 }

$O(n)$

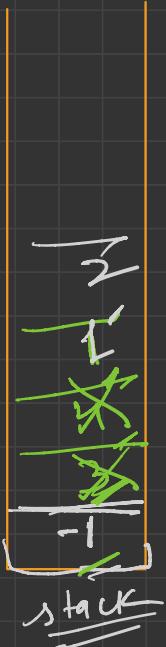
ans →

{
 ↑
 2, 1,
 ↑
 4, 3
 ↑
 3
 ↑
 (-1)}

$O(n)$

#2

s.push(i)
s.push(-1)



curr
3 → next smaller element

chotta element lao

s.top() element

chotta

Bade

→ ans store
→ s.push(curr)

→ chotta dhund ke lao
while (s.top() >= curr)

d
s.pop()

s.top() → chotta

-1 < 3 → T

3 < 4 → T

4 < 1 → F

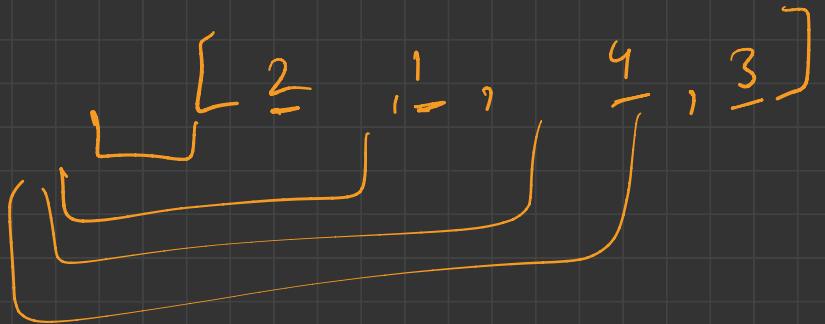
3 < 1 → F

-1 < 1 → T

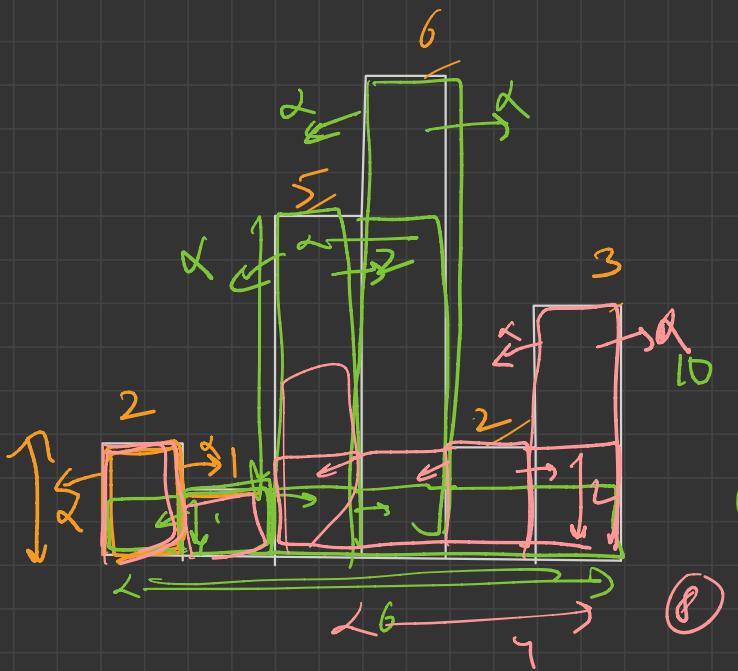
1 < 2 → T

$\rightarrow \text{ans} = \text{ans} \cdot \text{top}$
 $\rightarrow \text{s.push}(\text{ans})$

$\rightarrow \text{Next smaller} \rightarrow O(n)$
 $\rightarrow \text{prev , smaller}$



→ Langat Rectangular Force in Histogram



Brute force :=

$$\text{area} = \frac{\text{length}}{\text{width}} \times \frac{\text{breadth}}{\text{max}}$$

now

(6)

(8)

B.F

for (int i = 0 ; i < n ; i + +)

{

while (left)

{

}

while (right)

{

neware

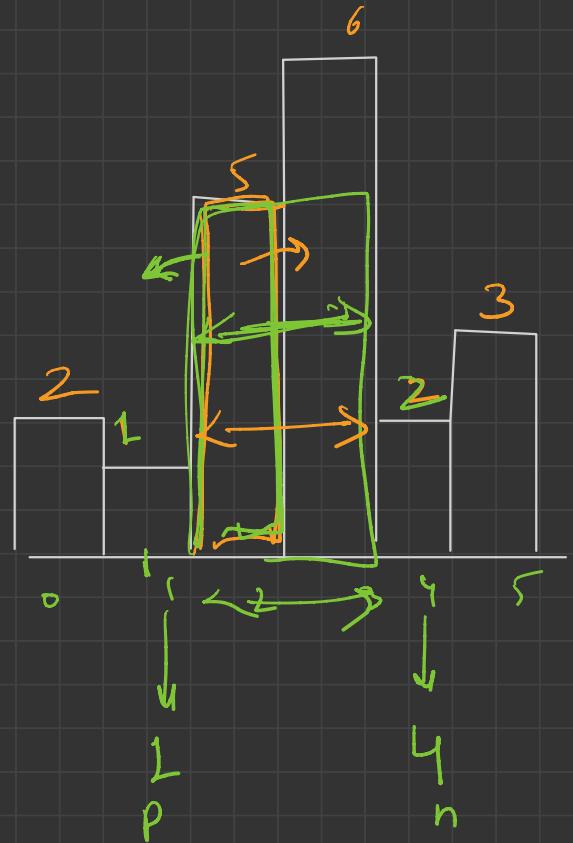
area = max (area , neware) ,

}

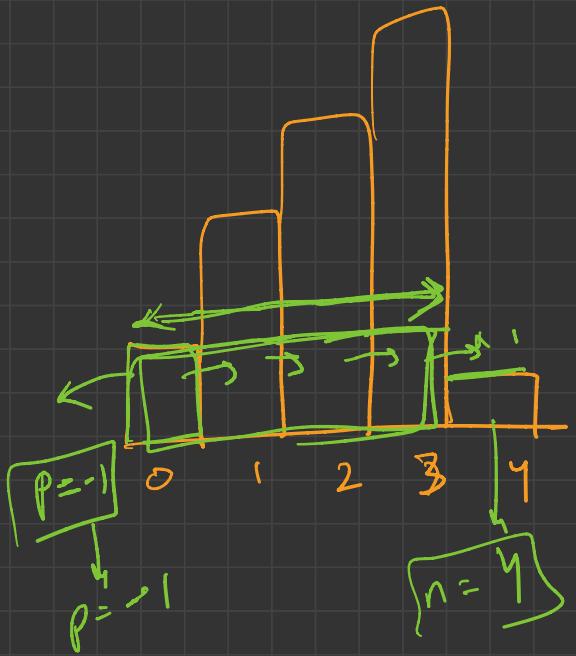
T-C
 $O(n^2)$

$O(n)$?

$O(n)$ → Approach #2

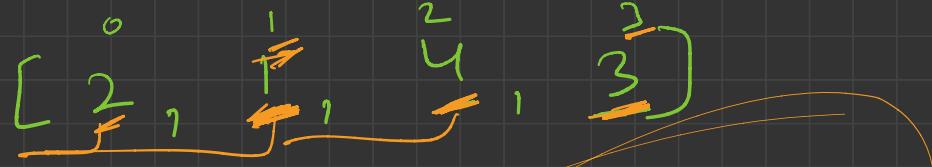


$$\text{width} = \boxed{n - p - 1} = 4 - 1 - 1 = 2$$



$$\begin{aligned}
 \text{width } 2 &= \frac{n - p - 1}{4 - (-1)} - 1 \\
 &= 4 + 1 \\
 &> 4
 \end{aligned}$$

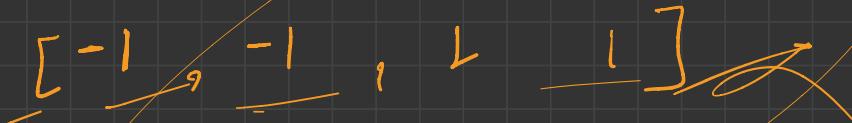
$n_{\text{ext}} \rightarrow$ next smaller element index
 $p_{\text{prev}} \rightarrow$ p_{prev}



$n_{cat} \rightarrow$



$p_{rw} \rightarrow$

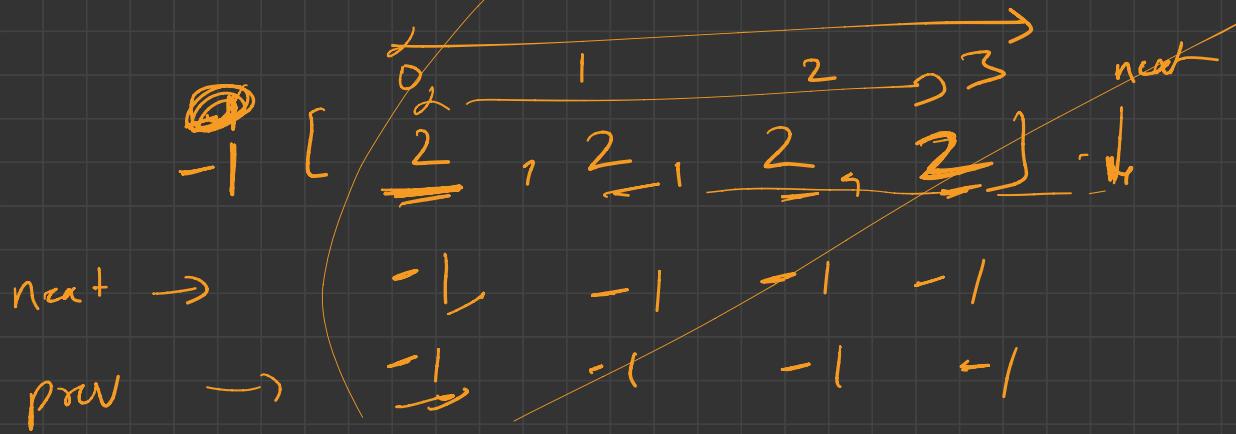
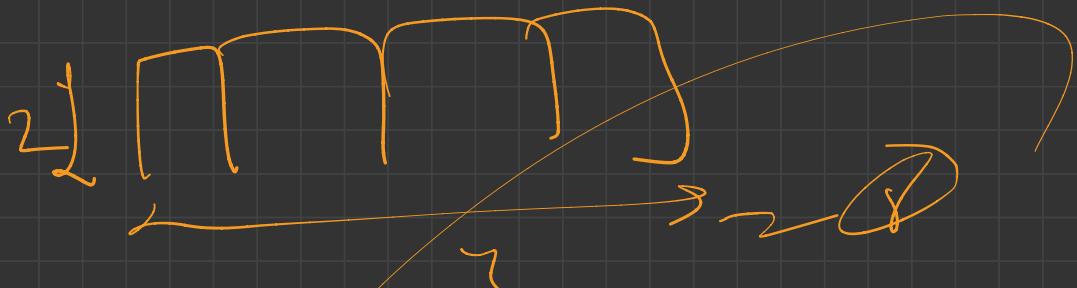


r

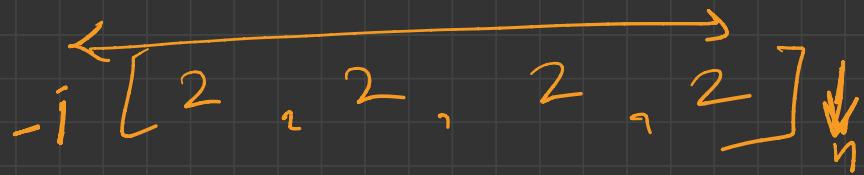
$area_1 =$



2 2 2 2



$$n-p-1 - 1 \neq (-1) \Rightarrow \text{width}$$



next = -1 -1 -1 -1α if ($next == -1$)
prev = -1 -1 -1 1

$n-p-1$
 $= -1 + 1 - \alpha \rightarrow$ ~~boxcar width > -1~~

area =

$T.C \rightarrow O(n)$ ~~area always~~
 $S.C \rightarrow O(n)$

