Trapping Rain Water

42. Trapping Rain Water   Solved ✓

Hard   ◇ Topics   🔒 Companies

Given n non-negative integers representing an elevation map where the width of each bar is 1, compute how much water it can trap after raining.

Example 1:

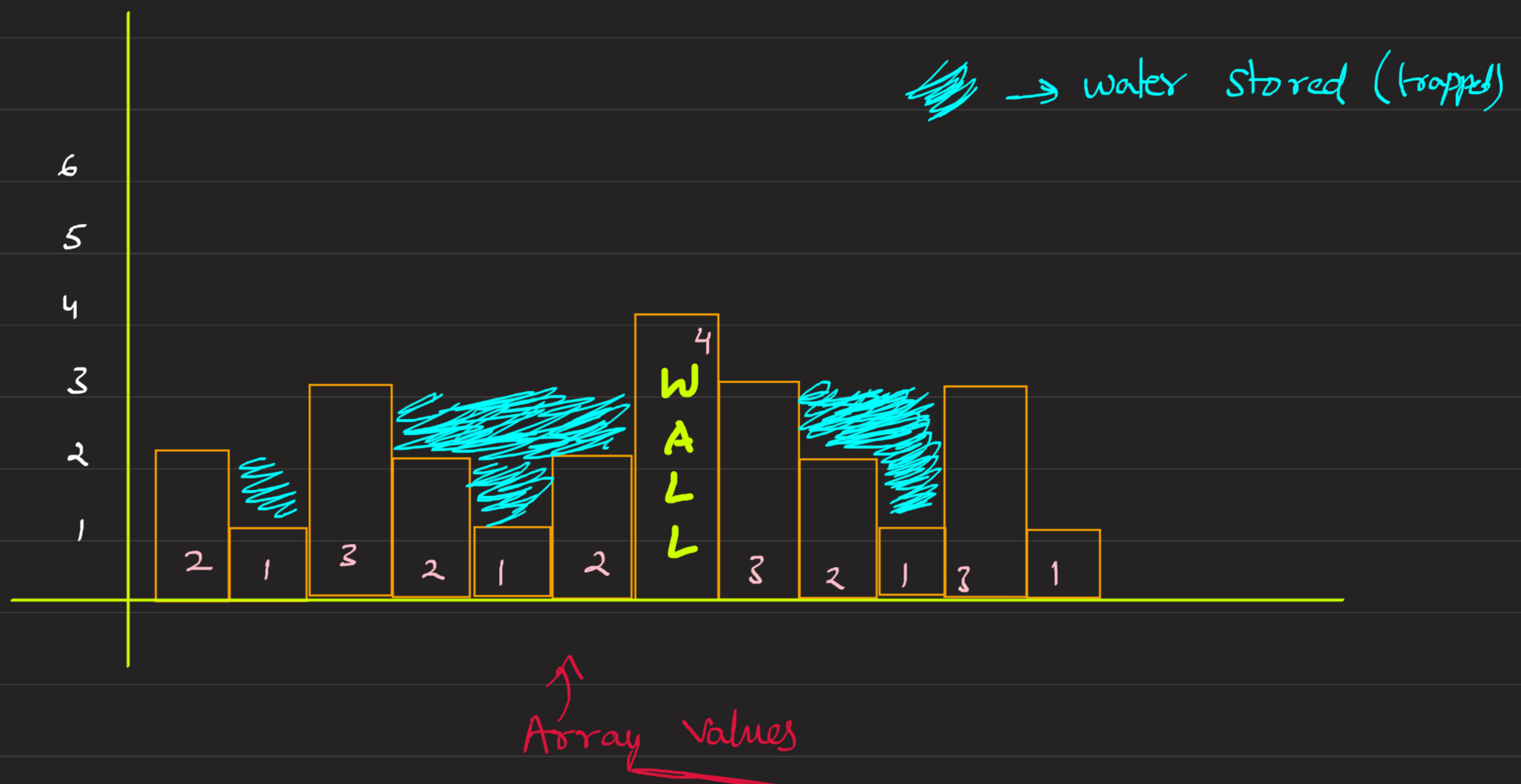**Input:** height = [0,1,0,2,1,0,1,3,2,1,2,1]
Output: 6
Explanation: The above elevation map (black section) is represented by array [0,1,0,2,1,0,1,3,2,1,2,1]. In this case, 6 units of rain water (blue section) are being trapped.
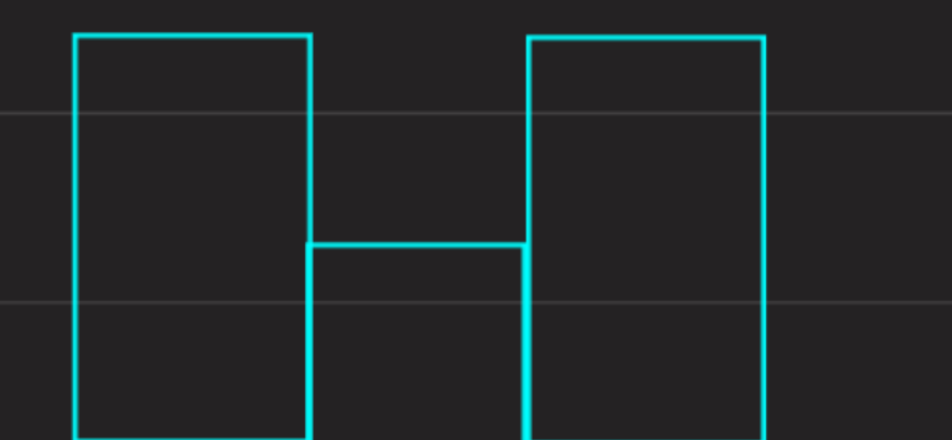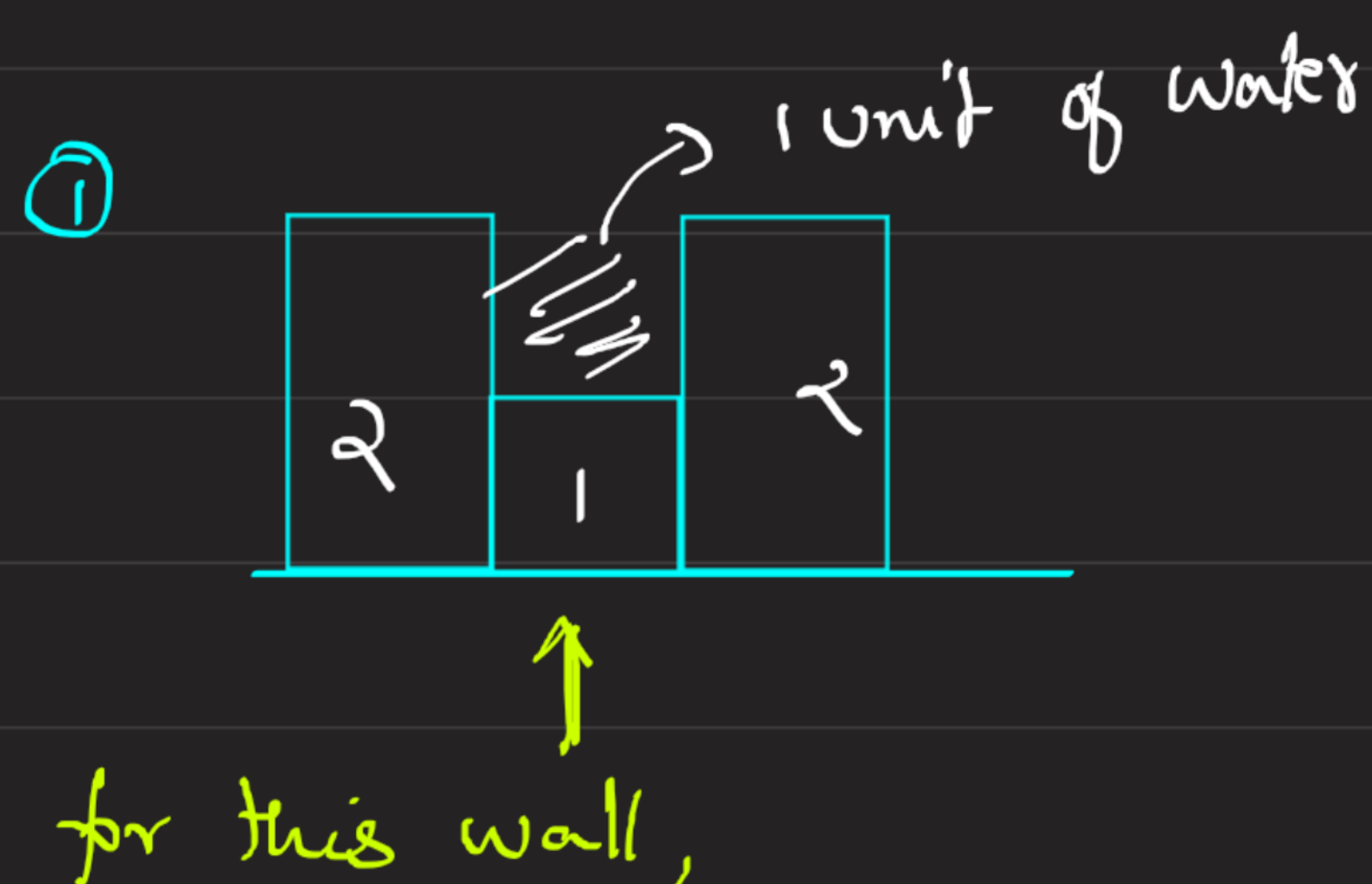
Example 2:

Input: height = [4,2,0,3,2,5]
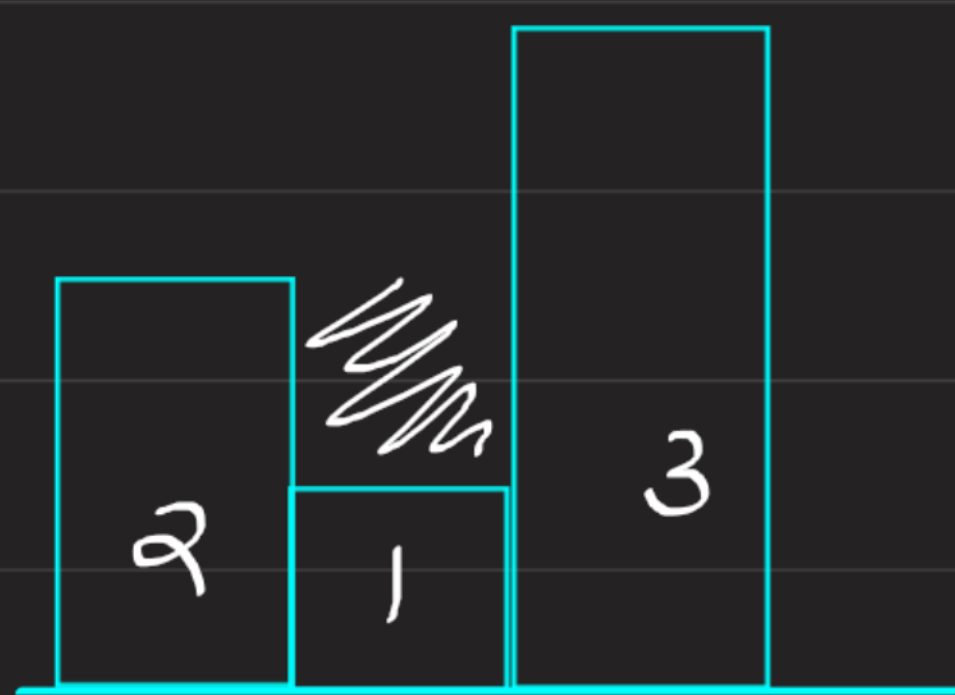**Output:** 9

$arr[] : (2, 1, 3, 2, 1, 2, 4, 3, 2, 1, 3, 1)$

→ water stored (trapped)

↑ Array values

* Calculate amount on each wall and add them → <u>ans</u>

let's observe some cases

① → 1 unit of water

for this wall,

leftBound = 2 (left greatest index)   }   myBound = min(leftBound, right Bound)
Right Bound = 2 (Right greatest index) }   = min(2,2)
                                                = 2

left Bound = 2
right Bound = 3

my limit = min(2, 3) = 2

the amount of water i can store $\leftarrow$ my limit $-$ my wall size

$= 2 - 1 = 1$

for i^{th} wall $\rightarrow$ left Bound = 3

right Bound = 3

my Ans = Min(lB, rB) $-$ wall

$= 3 - 1 = 2$ units

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for i^{th} wall $\rightarrow$ left Bound = 3

right Bound = 3

my Ans = Min(lB, rB) $-$ wall

$= 3 - 1 = 2$ units

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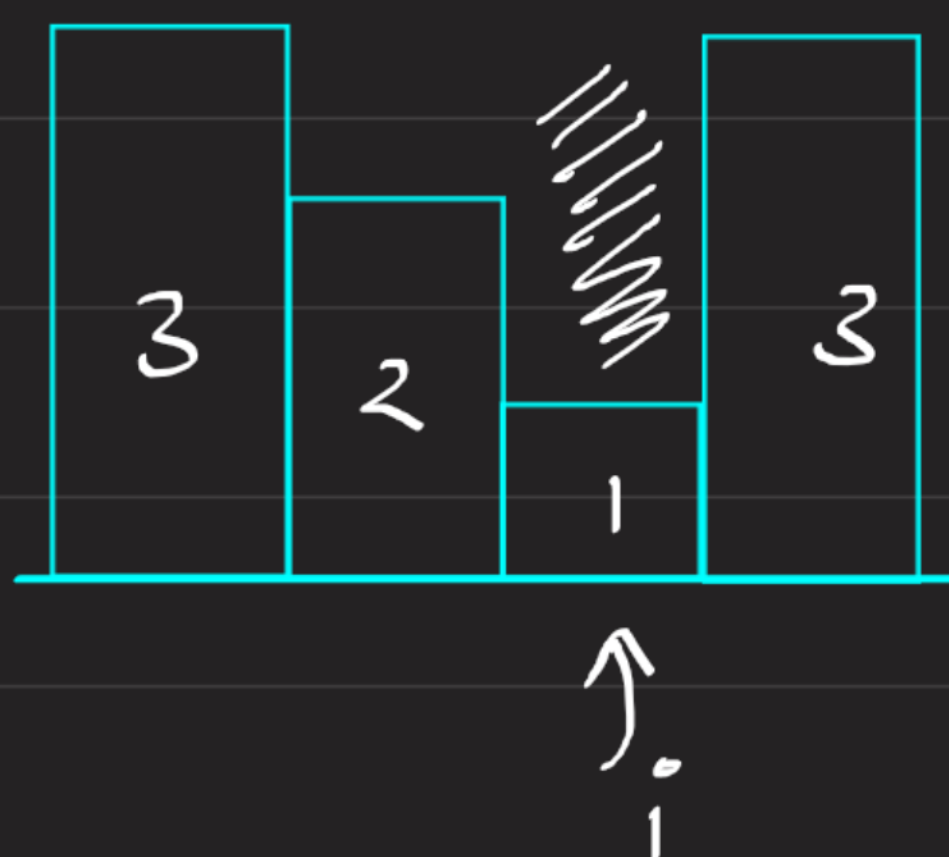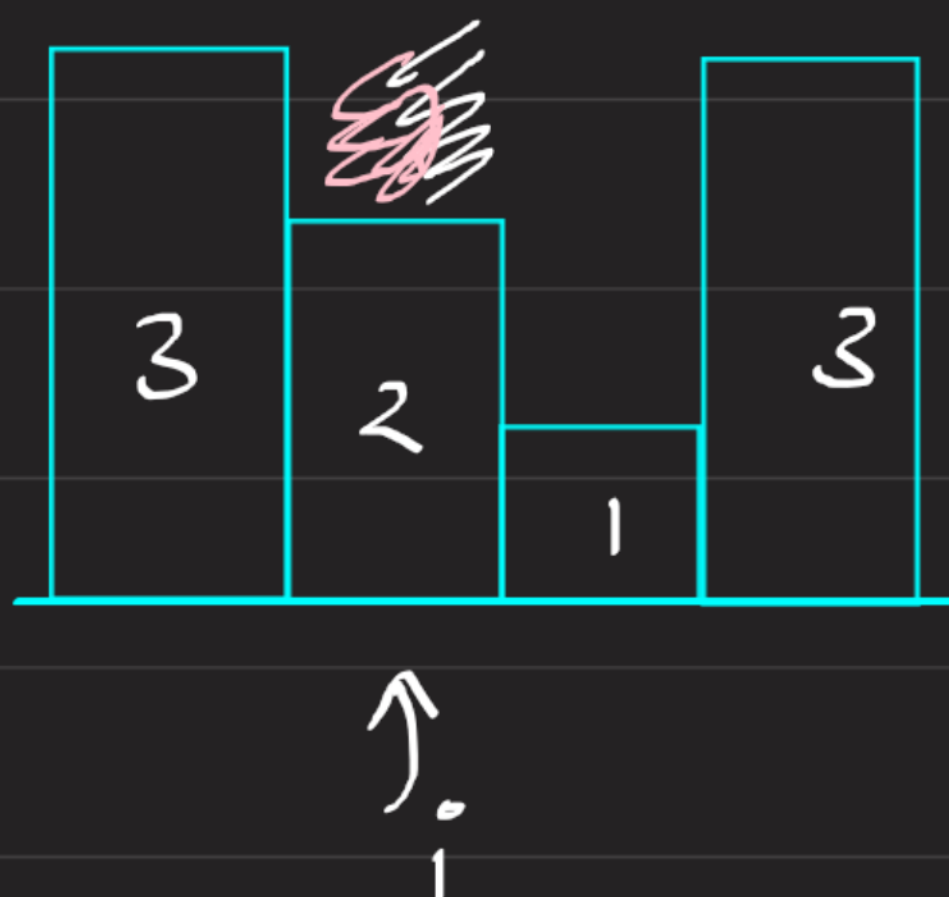
for i^{th} wall $\rightarrow$ left Bound = 3

right Bound = 3

my Ans = Min(lB, rB) $-$ wall

$= 3 - 2 = 1$ units

* Therefore, We somehow, need to track of which is the largest building to my left and to my right,

if that's done ⟶ Hard tag becomes Easy 😬

Which store heights of left max building

arr[] : $(2, 1, 3, 2, 1, 2, 4, 3, 2, 1, 3, 1)$

Prefix Max [] : $(2, 2, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4)$

Suffix Max [] : $(4, 4, 4, 4, 4, 4, 4, 3, 3, 3, 3, 1)$

At i^{th} wall,

$rb = Pmax(i-1)$

$lb = Smax(i+1)$

⟶ myBound / mylimit $= min(ub, lb)$

Amount of water ⟹ $ans = ans + (myBound - size\ of\ wall)$