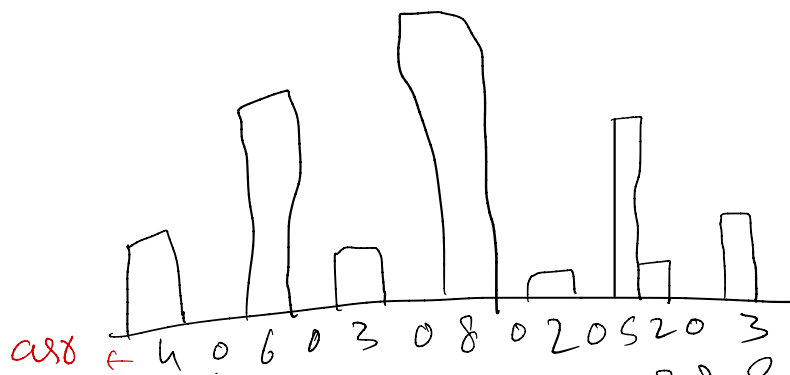


$$\text{Storage at this block} = \min(\text{left max}, \text{Right max}) - \text{arr}[i]$$

Result  $< 0$   
 $\Rightarrow$  Storage = 0



Left max  $\rightarrow$  4 4 6 6 6 6 8 8 8 8 8 8 8 8

Right max  $\leftarrow$  8 8 8 8 8 8 5 5 5 5 3 3 3 3

Storage 0 4 0 6 3 6 0 5 3 5 0 1 3 0

$\rightarrow$  add all to get storage amount

$$\min(\text{left max}, \text{Right max}) - \text{arr}[i]$$

R.T  $\rightarrow O(n)$

S.C  $\rightarrow O(n)$

## space optimized approach

$\Rightarrow$  while ( $lptr < rptr$ )

$q \rightarrow$  right max  
 $l \rightarrow$  left max

if ( $q > l$ )

$\rightarrow$  increment  $lptr$

if ( $height[lptr] > l$ )

$l = height[lptr]$

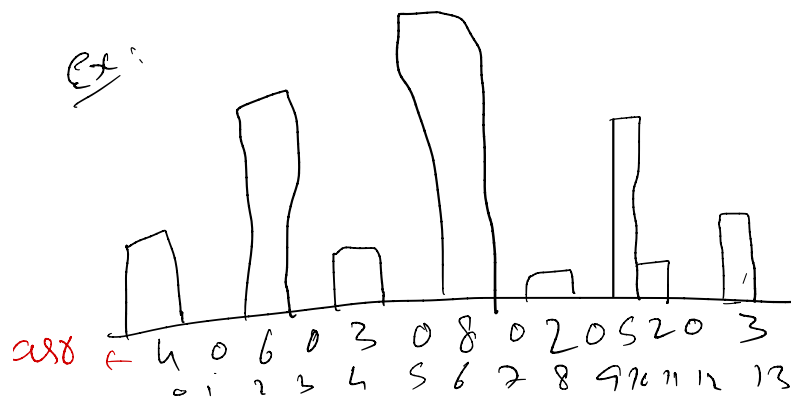
else  
 $res += l - arr[lptr]$

else:  $\rightarrow$  decrement  $rptr$

if ( $height[rptr] > r$ )

$r = height[rptr]$

else  
 $res += r - arr[rptr]$



initially:

$$l = 0, r = 3$$

$$lptr = 0$$

$$rptr = 3$$

$$r < l \Rightarrow \text{decrement } rptr \Rightarrow rptr = 12$$

$$\text{since } \text{height}(lptr) < r$$

$$\Rightarrow res += r - \text{height}(lptr)$$

$$= 3 - 0 = 3$$

Intuition:

If we are checking  $lptr$  it is obvious that  $rightmax > leftmax$ .

$\therefore$  The water it stores at  $lptr$  is dependent on  $leftmax$  (since it is minimum)   
 then  $rightmax$    
 else water spill.

|| by if we are checking  $rightptr$ , it is obvious that  $leftmax > rightmax$ .   
  $\therefore$  water stores at  $rightptr$  dependent on  $rightmax$ .