

Q<sup>21</sup> Given a list of integers, find the next greater element for each of the elements in the list.

→ 10, 7, 4, 2, 9, 10, 11, 3, 9

[11, 9, , 9, , 9, 10, 11, -1, -1, -1] ans

Try to make cases

→ if we have an array of descendly order.

→ 11, 10, 9, 7, 3, 1

-1 -1 -1 -1 -1 -1



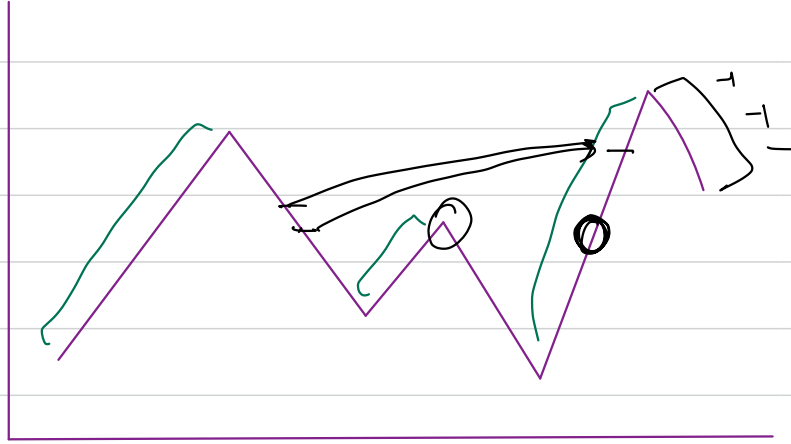
If we have an array of increasing order.

1, 4, 9, 12, 15, 18

4 9 12 15 18 -1



# General Input



→ next elmt  
→ -1

curr elmt → 7  
next elmt → 4

10, curr elmt < next

7, next larger of curr is next

10, 7, 4, 2, 9, 10, 11, 3, 9

2, 9

2 < 9

We have to keep a track what was the last

element whose answer is pending

Index

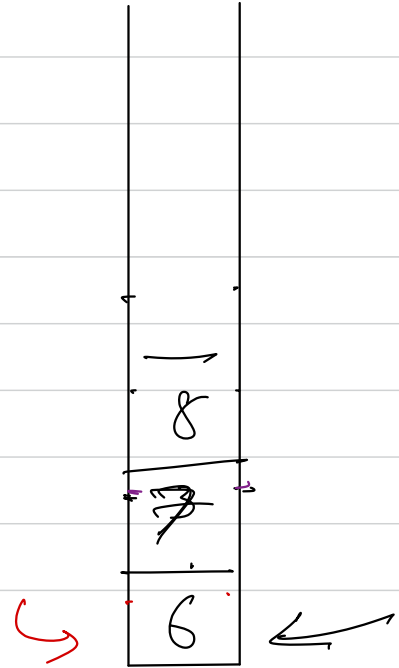
TC  $\rightarrow O(n)$   
SL  $\rightarrow O(n)$

10, 7, 4, 2, 9, 10, 11, 3, 8  
0 1 2 3 4 5 6 7 8

10 < arr [st.top]

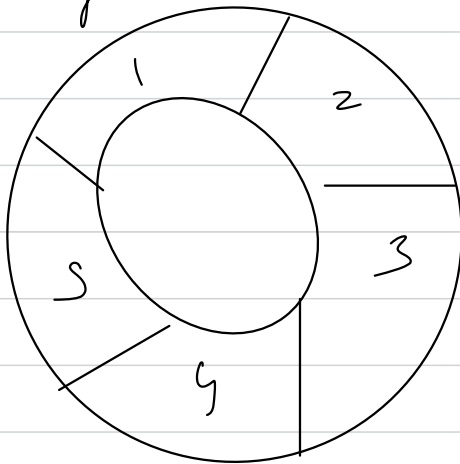
3 < 11

ans = [11, 9, ~~9~~, 9, 10, 11, 4, 1, 1]  
0 1 2 3 4 5 6 7 8



Q2

Now in the previous problem, instead of normal 1D array, you have a circular array find the next layer for every element:



→ [1, 2, 1]  
→ 2, 1, 2  
ans

id on → size of list  
← indices

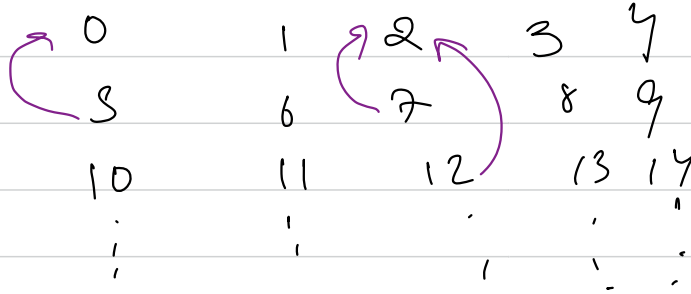
1	2	3	4	5
0	1	2	3	4
5	6	7	8	9
10	11	12	13	14

$n \rightarrow \text{size}$

Andrew

1, 2, 3, 4, 5

id 0



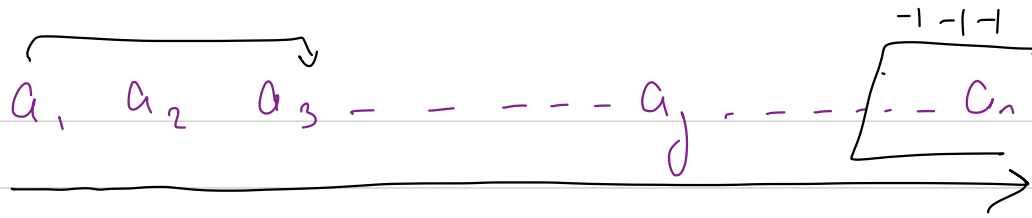
$\text{size} = 0$

$7 \% 5 \rightarrow 2$

$12 \% 5 = 2$

We will read the list once then we get next greater for 1D normal list

But if we apply the same algo twice, then it gives for circular array



We need to loop thru whole indices if len

$$TC \rightarrow O(n)$$

$$\underline{\underline{SC \rightarrow O(1)}}$$



## Q<sup>n</sup> STOCK SPAN Problem

You've been given daily price quotes for a stock  
& we need to calc span of the stock for  
all n days.

Span  $\rightarrow$  span on any day  $i$  is defined as max  
no. of consecutive days just before the given  
day for which price was less than or equal to  
the price on its day.

100, 80, 60, 20, 60, 25, 15

1, 1, 1, 2, 1, 4, 6 → spectrum

Q<sup>n</sup> Given an array A, of n integers, count the no. of non empty contiguous subarray whose leftmost element is not larger than other elements.

1, 4, 2, 5, 3  $\longrightarrow$  (11)

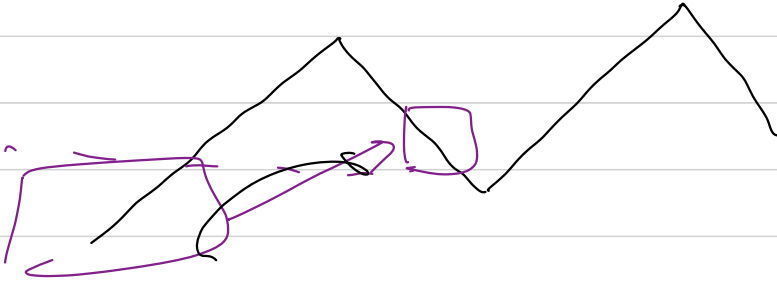
[1] [4] [2] [5] [3]

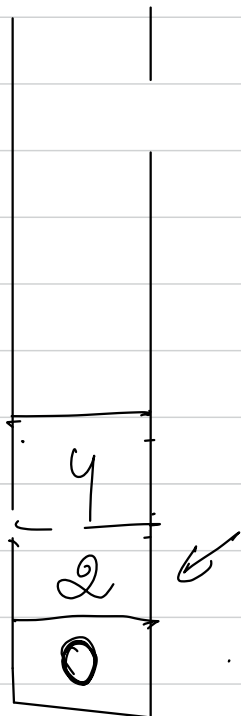
[1, 4], [2, 5], [1, 4, 2], [2, 5, 3], [1, 4, 2, 5]  
[1, 4, 2, 5, 3]

1, 4, <sup>2</sup>, 5, 3 ←

→ if we have an increasing series, then it looks

→ what to do for decreasing seq.





1, 4, 2, 5, 3  
0 1 2 3 4

[1, 4] [2]  
[1, 4] [2]  
[1, 4, 2]

ans = ~~0~~ ~~1~~ ~~3~~ ~~5~~ ~~8~~ 11

[5] [2, 5] [1, 4, 2, 5]  
[3], [2, 5, 3] [1, 2, 3, 5]