

FINDING MINIMUM IN A ROTATED ARRAY (sorted)

1 2 3 4 5 sorted

↓ rotate by 2

4 5 ① 2 3

↑
find minimum element

Note: To do this we need to understand some properties in a rotated array

1. The minimum element will always be lower than the previous and next elements (if not at first/last index)

2. We can think of the array having 2 parts

4 5 1 2 ③ — RIGHT
part 1 part 2

Elements in the first part will be $>$ rightmost element
Elements in the second part will be $< =$ rightmost element

We can use the rightmost element to use as pivot to adjust the search space by updating start and end indexes.

4 5 1 2 3

→ At every iteration : check if $A[mid]$ is minimum
Condition to check is minimum :

$A[mid] \leq \text{RIGHTMOST element and}$
 $(mid == 0 \text{ or } A[mid] < A[mid - 1])$

→ Else : do a normal binary search

→ If $A[mid] < \text{RIGHTMOST}$:
then we need to go left

4	5	1	2	3
<hr/>		<hr/>		
> RIGHT		< = RIGHT		

end : $mid - 1$

→ If $A[mid] \geq \text{RIGHTMOST}$:
then we are in 1st part and
should move right

start : $mid + 1$