Context

1. Problem
2. Optimal Solution

Problem

Example 1:

> **Input:** nums = [3,4,5,1,2]
> **Output:** 1
> **Explanation:** The original array was [1,2,3,4,5] rotated 3 times.

Example 2:

> **Input:** nums = [4,5,6,7,0,1,2]
> **Output:** 0
> **Explanation:** The original array was [0,1,2,4,5,6,7] and it was rotated 4 times.

Example 3:

> **Input:** nums = [11,13,15,17]
> **Output:** 11
> **Explanation:** The original array was [11,13,15,17] and it was rotated 4 times.

153. Find Minimum in Rotated Sorted Array

Solved

Medium Topics Companies Hint

Suppose an array of length `n` sorted in ascending order is **rotated** between `1` and `n` times. For example, the array `nums = [0,1,2,4,5,6,7]` might become:

- `[4,5,6,7,0,1,2]` if it was rotated `4` times.
- `[0,1,2,4,5,6,7]` if it was rotated `7` times.

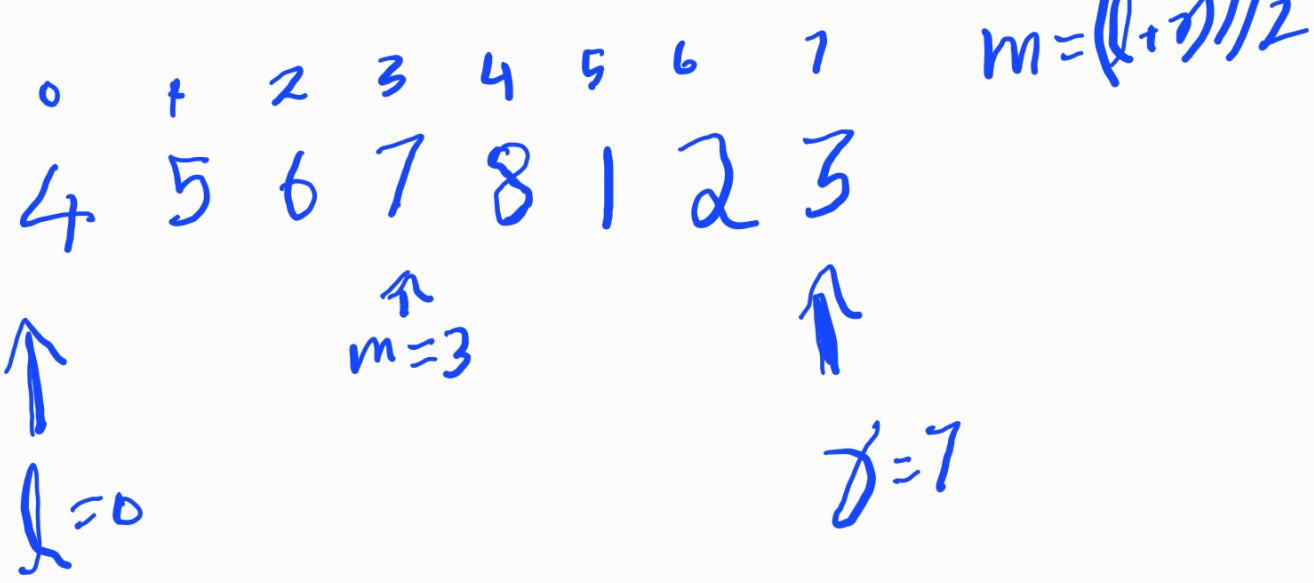
Notice that **rotating** an array `[a[0], a[1], a[2], ..., a[n-1]]` 1 time results in the array `[a[n-1], a[0], a[1], a[2], ..., a[n-2]]`.

Given the sorted rotated array `nums` of **unique** elements, return *the minimum element of this array*.

You must write an algorithm that runs in `O(log n) time`.

Solution

(1)



if nums[l] < nums[r]

return nums[l]

if nums[m] > nums[r]

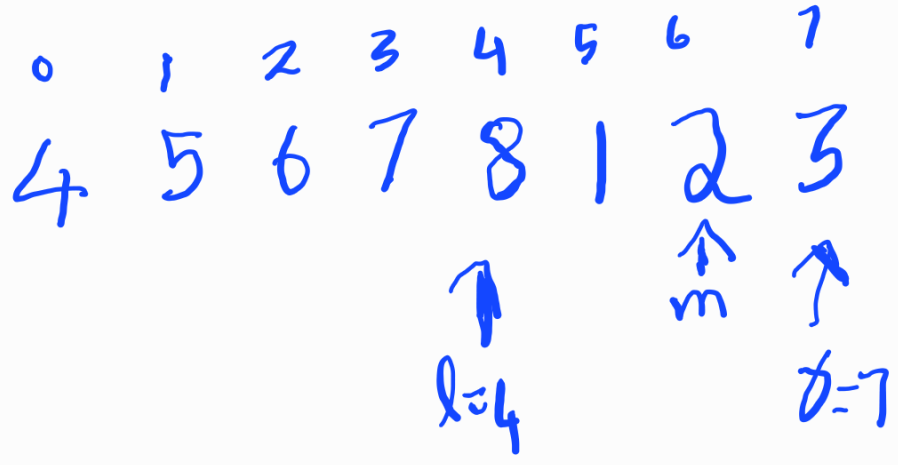
l = m + 1

else

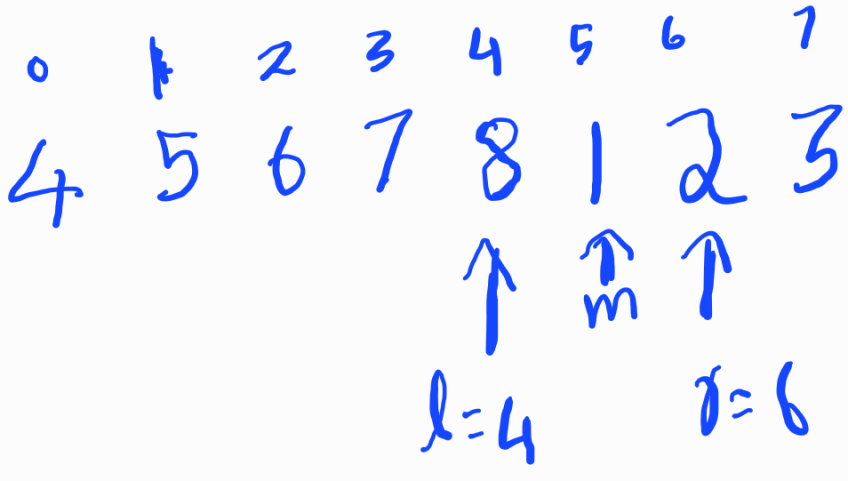
r = m

return nums[l]

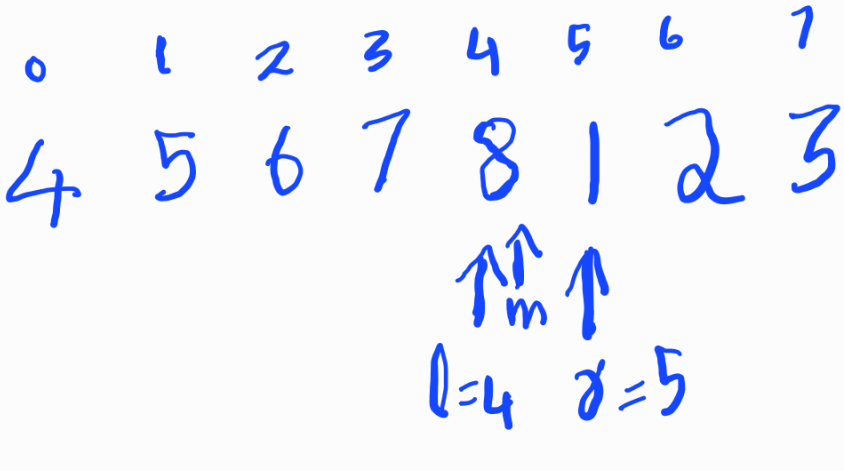
(2)


0 1 2 3 4 5 6 7
4 5 6 7 8 1 2 3
m
l=4
r=7

(3)


0 1 2 3 4 5 6 7
4 5 6 7 8 1 2 3
m
l=4
r=6

(4)


0 1 2 3 4 5 6 7
4 5 6 7 8 1 2 3
m
l=4
r=5

5

0	1	2	3	4	5	6	7
4	5	6	7	8	1	2	3

↑

l, γ