Find Min in Rotated Sorted Array

$[\overset{l}{4}, 5, 6, \overset{m}{7}, \underset{l}{0}, 1, \underset{h}{2}] \xrightarrow{} l \leq m$

$[\underset{l}{8}, \overset{m}{\underset{h}{0}}, 1, 2, 5, 7]$

$l \leq h$

$[\underset{l}{11}, 13, \underset{m}{15}, 17, \underset{h}{25}]$

return l

- Brute force - Linear — O(n)
  Check for i & i+1
    if i+1 < i
      return i+1

TC: log(n)

SC: O(c)

O(1)

Find Min in Rotated Sorted Array

Interviews

WHITEBOARD

- Ask for clarifying question
- Clarify about constraints
  - Range of n & nums[i]
  - edge cases
- Repeat the question to make it clear
- Start with Brute Force & Talk about Brute Force Time Complexity
- OPTIMIZE

Talk out your thought process. —
- once you have optimal solution
- Do basic dry run.

AFTER OPTIMIZING
- TC
- SC

- what are you trying
- how it can be done
- how will it optimize TC & SC
- Improvise on the hints

- ONLY WHEN YOU HAVE THE LOGIC STRONG. TOUCH YOUR KEYBOARD

Find Peak Element

[1, 2, 1, 3, 5, 6, 4]

[1, 4]

- Brute force - every element with its neighbours, if it is greater than both of them

  O(n)

-

  mid > mid+1

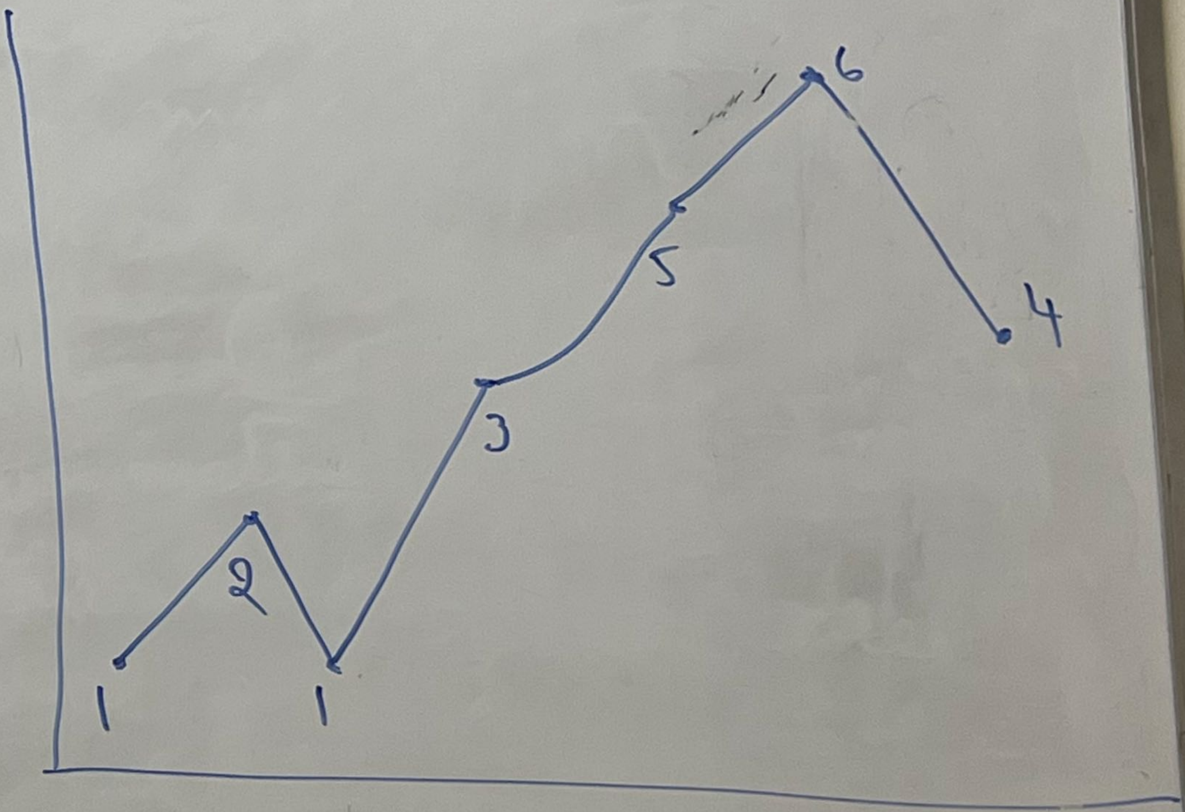
- && mid > mid-1 - both side smaller

  returning mid

- Doesn't matter <- - both side greater

- left less, Right greater

- Right less, left less.



Search 2D Matrix

$$\begin{array}{cl} & \xrightarrow{\quad n \quad} \\ m \Big\downarrow & [[\overset{0}{1}, \overset{1}{3}, \overset{2}{5}, \overset{3}{7}], \\ & [\overset{4}{10}, \overset{5}{11}, \overset{6}{16}, \overset{7}{20}], \\ & [\overset{8}{23}, \overset{9}{\underline{30}}, \overset{10}{34}, \overset{11}{60}]] \end{array}$$

- $\Theta(m \times n)$ – bruteforce
- $\Theta(m + \log n)$ – Thaarani approach
- $\Theta(m + n)$ – Rohit
- $\Theta(\log mn)$ – Sriram
- $\Theta(\log mn)$ – optimal

$l = 0$

$h = m \times n - 1$

$1 \le m, n \le 100$

$m \qquad n$

$[\overset{l}{1}, 3, 5, 7, 10, \boxed{11}, 16, 20, 23, 30, 34, 60]$

```
mid = $l + \frac{(h - l)}{2}$
mid = 5
$r = i / n$
$c = i \% n$
matrix[r][c] == Target
    return True.
elif matrix[r][c] > target
    R = mid-1
else:
    l = mid+1
```