

Q.8 Search In Rotated Array

Saturday, January 25, 2025 4:17 PM

Rotated Array working

array = $[2, 4, 5, 7, 8, 9, 10]$

1 Rotation

After 1

Rotation

= $[10, 2, 4, 5, 7, 8]$

2 Rotation

After 2

Rotation

= $[8, 10, 2, 4, 6, 7]$

⋮

so on

Working of question

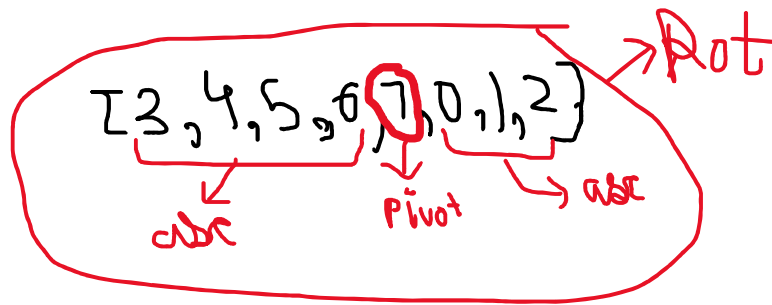
Approaches:-

① Find the pivot in the array.

Pivot means where the next element is ascending.

$[8, 10, 2, 4, 6, 7]$

→ Pivot

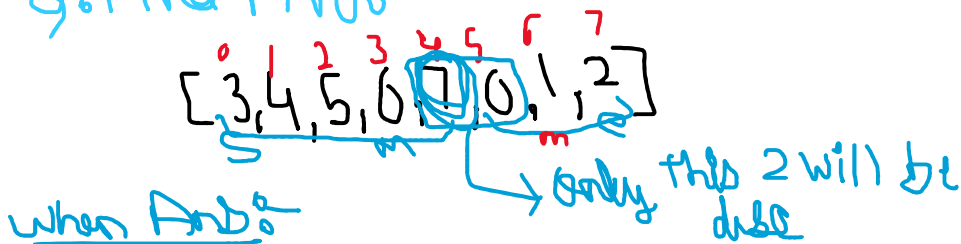


② After finding Pivot Point apply BS

③ Search in first half \Rightarrow Simple BS $[0, \text{Pivot}]$

④ Otherwise, Search in second half $[\text{Pivot}+1, \text{end}]$

g. Find Pivot



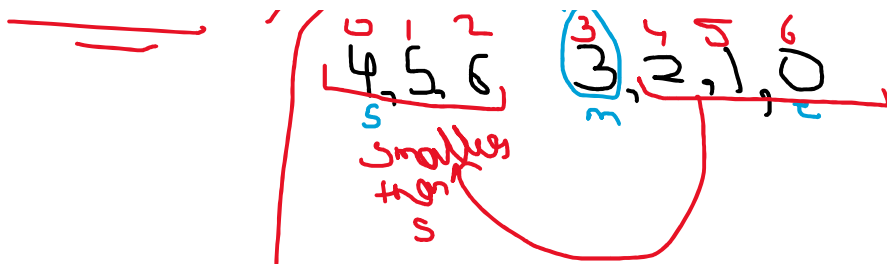
\rightarrow When you find that $\text{mid} > \text{mid} + 1$ element
i.e. - Pivot // Case 1

Suppose

Case 2 \Rightarrow if $\text{mid} < \text{mid} - 1$
i.e. also my $\text{ans} = \text{mid} - 1$

Case 3 \Rightarrow $\text{start} > \text{mid}$

Diagram illustrating an array $[4, 5, 6, 3, 2, 1, 0]$ with indices 0-6 above. The element 3 is circled in blue.



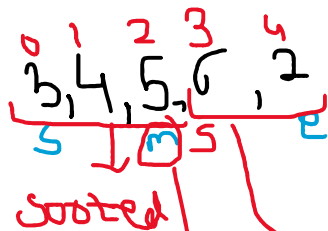
→ In this case all elements from mid will be $< \text{start}$

Hence, we can ignore all mid right side element,

Since we are looking for peak, i.e. largest element,

$\boxed{s = \text{mid} + 1}$ // ignore

Case 4 $\Rightarrow \text{start} \leq \text{mid}$



$s = m + 1$

If this was pivot

It wouldn't be return in case 1 & 2

So we know this is not pivot

Hence proved. that binary search

hence proved, that bigger number
lies ahead

hence, ignore mid & put
 $s = \text{mid} + 1$