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Autocomplete

4. Median of Two Sorted Arrays

Hard

5816

874

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There are two sorted arrays **nums1** and **nums2** of size m and n respectively.

Find the median of the two sorted arrays.

The overall run time complexity should be $O(\log(m+n))$.

You may assume **nums1** and **nums2** cannot be both empty.

Example 1:

```
nums1 = [1, 3]
nums2 = [2]
```

The median is 2.0

Example 2:

```
nums1 = [1, 2]
nums2 = [3, 4]
```

The median is $(2 + 3)/2 = 2.5$

Accepted 583.9K | Submissions 2.1M

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```
1 class Solution {
2 public:
3     double findMedianSortedArrays(vector<
4     vector<int>& nums2) {
5
6     }
7 };
8
```

Using Two pointers
 $O(n+m)$

²
 $x_1, x_2 \mid x_3, x_4, x_5, x_6$
⁴

$y_1, y_2, y_3, y_4, y_5 \mid y_6, y_7, y_8$
⁵ ³

partition X + partition Y = $(x + y + 1) / 2$ for odd & even length arrays

if $\max \text{Left } X \leq \min \text{Right } Y$
 $\max \text{Left } Y \leq \min \text{Right } X$
 return $\text{avg}(\max(x_2, y_5), \min(x_3, y_6))$ if even number of elements
 return $\max(x_2, y_5)$ if odd

else if $\max \text{Left } X > \min \text{Right } Y$
 (move Binary Search left in X)
 $\text{high} = \text{partition } X - 1$
 else
 move towards right in X
 $\text{low} = \text{partition } X$

1, 3, 8, 9, 15

7, 11, 18, 19, 21, 25

$$\text{start} = 0 \quad \text{end} = 4 \quad \text{partition } X = \frac{0+4}{2} = 2$$

$$\begin{aligned} \text{partition } Y &= \frac{(k+Y+1)}{2} - \text{partition } X \\ &= \left(\frac{5+6+1}{2} \right) - 2 \end{aligned}$$

$$= \underline{\underline{4}}$$

