14. Rearrange Array Elements by Sign | 2 Varieties of same Problem

2149. Rearrange Array Elements by Sign

Hint

Medium 1.3K 70

Companies

You are given a **0-indexed** integer array `nums` of **even** length consisting of an **equal** number of positive and negative integers.

You should **rearrange** the elements of `nums` such that the modified array follows the given conditions:

Every **consecutive pair** of integers have **opposite signs**.

For all integers with the same sign, the **order** in which they were present in `nums` is **preserved**.

The rearranged array begins with a positive integer.

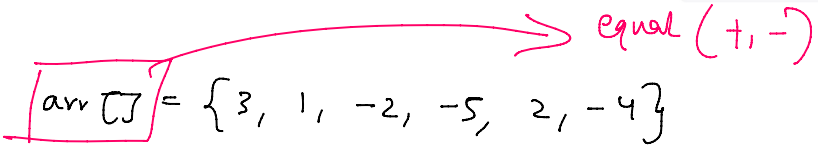
Return *the modified array after rearranging the elements to satisfy the aforementioned conditions.*

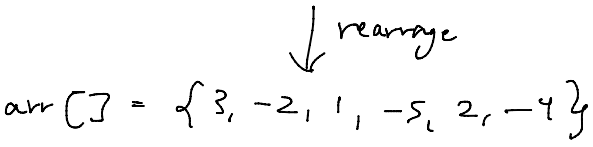
Example 1:

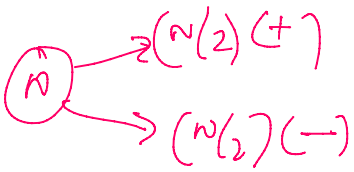
```
Input: nums = [3,1,-2,-5,2,-4]
Output: [3,-2,1,-5,2,-4]
Explanation:
The positive integers in nums are [3,1,2]. The negative integers are [-2,-5,-4].
The only possible way to rearrange them such that they satisfy all conditions is [3,-2,1,-5,2,-4].
Other ways such as [1,-2,2,-5,3,-4], [3,1,2,-2,-5,-4], [-2,3,-5,1,-4,2] are incorrect because they do not satisfy one or more conditions.
```

Example 2:

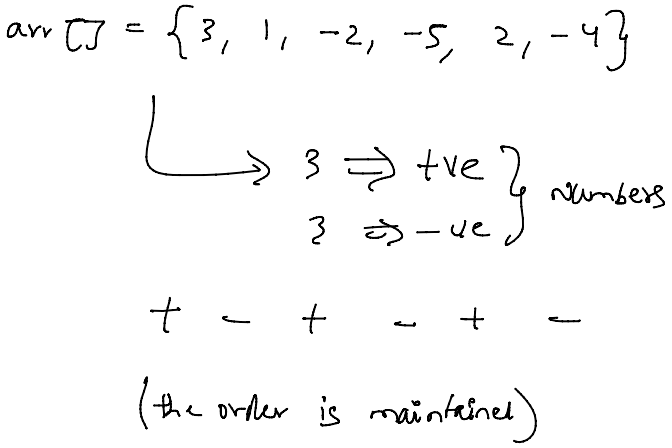
```
Input: nums = [-1,1]
Output: [1,-1]
Explanation:
1 is the only positive integer and -1 the only negative integer in nums.
So nums is rearranged to [1,-1].
```







So, N will be always be even number



Brute force

Brute force

→ pos [3, 1, 2] → Create two array (pos and neg)

→ neg [-2, -5, -4] → Iterate over the original array and push the +ve values to the pos array same for the neg.

3	-2	1	-5	2	-4
0	1	2	3	4	5

↳ If you look into this the positive elements are in the even index (0 2 4) ⇒ even index

-ve elements in the odd index

```
for(i=0; i < n/2 ; i++) {
    arr[2 x i] = pos[i]        TC ⇒ O(N)+O(N)
    arr[2xi + 1] = neg[i]      SC ⇒ O(N)
}
```

2nd Approach

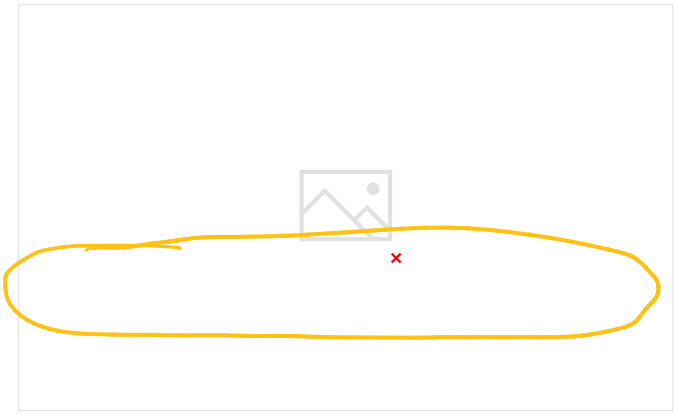
ans[] = { 3 -2 1 -5 2 -4 }

0	1	2	3	4	5		
↑	↑	↑	↑	↑	↑	↑	↑
pos	-ve	pos	-ve	pos	-ve	pos	-ve

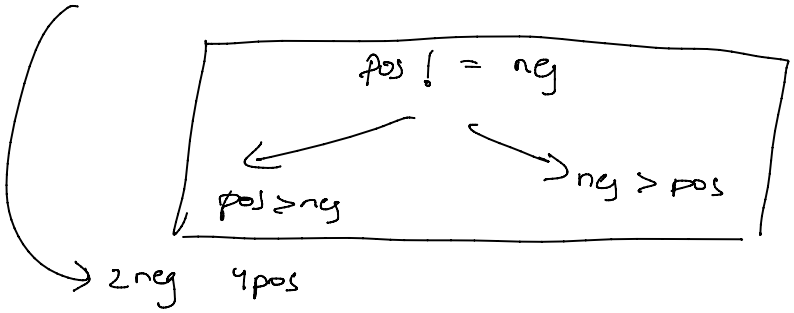
↳ return ans[]

TC ⇒ O(N) SC ⇒ O(N)

2nd variety problem :



arr[] = {1, 2, -4, -5, 3, 6}



pos > neg

ans[] = { 1, -4, 2, -5, 3, 6 }

arr[] = {1, 2, -4, -5, 3, 6}

pos [] = { 2, 3, 4, 1 }

neg [] = { -1, -3 }

pos > neg

```
for(i=0; i<2; i++)
{   arr[i*2] = pos[i]
    arr[i*2+1] = neg[i]
}
```

this is for pos == neg

now so more pos are left

```
for(i=2 ; i<pos.size ; i++)
{   arr[ind] = pos[i]
    ind++
}
```

extra code

T.C ⇒ O(N) + O(min (pos, neg)) + O(left over)