Unique Number 11

Wednesday, April 23, 2025 11:04 PM

Unique Number 11

Unique Number II

Difficulty: **Medium** Accuracy: **36.9%** Submissions: **163K+** Points: **4** Average Time: **15m**

Given an array **arr[]** containing **2*n + 2** positive numbers, out of which **2*n numbers exist in pairs** whereas only two number occur exactly once and are **distinct**. Find the other two numbers. Return the answer in increasing order.

Examples:

Input: arr[] = [1, 2, 3, 2, 1, 4]
Output: [3, 4]
Explanation: 3 and 4 occur exactly once.

Input: arr[] = [2, 1, 3, 2]
Output: [1, 3]
Explanation: 1 and 3 occur exactly once.

Input: arr[] = [2, 1, 3, 3]
Output: [1, 2]
Explanation: 1 and 2 occur exactly once.

Constraints:
$2 \leq arr.size() \leq 10^6$
$1 < arr[i] < 5 * 10^6$
arr.size() is even

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Approach:-

1. First we do XOR of all the numbers through which the XOR all the repeated numbers become zero and the remaining value will be the xor of remaining two numbers.

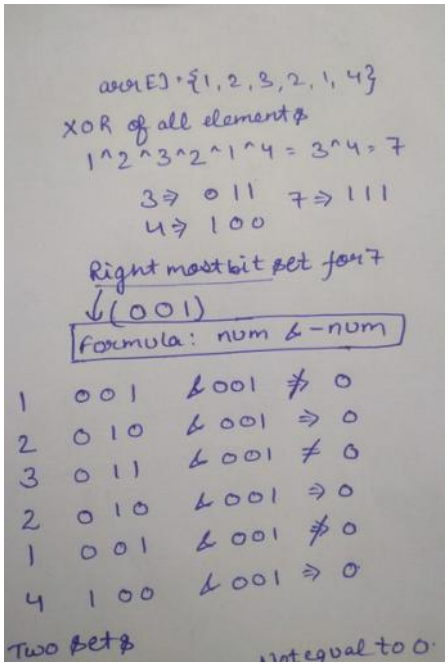
2. Now the problem arises how to get the two numbers from its xor.

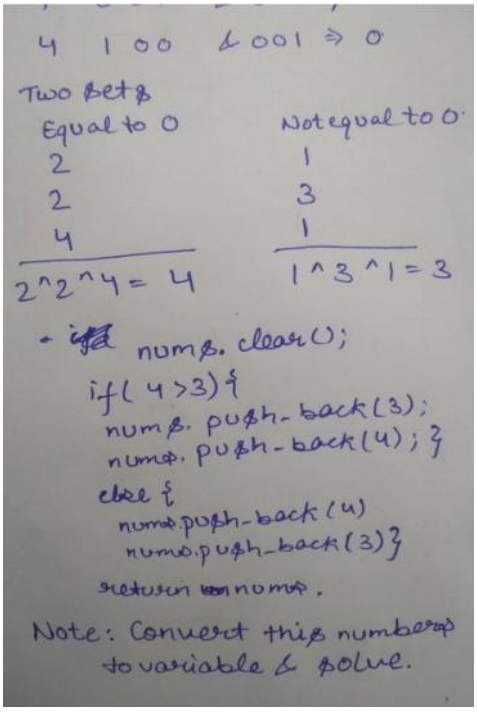
3. We will find the rightmost set bit & apply AND operation with all elements & divide the elements

into two parts:

- one which give 0 with the & operation & the other which doesn't. The answer will never be on the same side.

4. Then if do xor operation of the two parts I can see that I get the two numbers from two parts.





Note:- To find LSB of a number, use the formula:-

$$LSB = n \;\&\; -n$$

↑ 2's complement of a number

```
class Solution{
    public:
        vector<int> singleNum(vector<int>& arr){
```

```
public:
    vector<int> singleNum(vector<int>& arr){
        int x=0;
        for(int i:arr) x=x^i;

        int lsb= x & -x;

        vector<int>ans(2);

        int a=0, b=0;

        for(int i:arr){

            if(i&lsb){a=a^i;}

              else{b=b^i;}

            }
          ans[0]= min(a,b);

          ans[1]= max(a,b);

          return ans;}};
```

T.C. O(n) S.C. O(1)