15. Smallest Positive missing number

Medium Accuracy: 45.09% Submissions: 51757 Points: 4

You are given an array **arr[]** of **N** integers including 0. The task is to find the smallest positive number missing from the array.

Example 1:

```
Input:
N = 5
arr[] = {1,2,3,4,5}
Output: 6
Explanation: Smallest positive missing
number is 6.
```

→ on O(N) & O(1) space

① The algorithm that we are here is simple.

② We use indices of arrays to denote presence of an element.

③ If say arr[i] = x, and we've to mark that x is present, then will do arr[x] → some identifying value.

④ And then while iterating we check for the identifying value, and return the index of first violation

Fn :-

①

```
int missingNumber(int arr[], int n) {
    // First separating positive and negative numbers.
    int shift = segregateArr(arr, n);
    //Shifting the array and calling function to find result in the positive part.
    //returning the result.
    return findMissingPositive(arr+shift, n-shift);
}
```

① Segregates the +ve and -ve
② Calls for the positive part of the array.

② Segregating fn :-

```
int segregateArr (int arr[], int n) {
    int j = 0, i;
    for(i = 0; i < n; i++) {
        if(arr[i] <= 0) {
            //Changing the position of negative numbers and 0.
            swap(arr[i], arr[j]);
            //Incrementing count of non-positive integers.
            j++;
        }
    }
    return j;
}
```

→ Position shifted for positive nos to start.

```
int findMissingPositive(int arr[], int n) {

    //Marking arr[i] as visited by making arr[arr[i] - 1] negative.
    //Note that 1 is subtracted because index starts from 0 and
    //positive numbers start from 1.
    for(int i=0; i<n; i++) {

        if(abs(arr[i]) - 1 < n && arr[ abs(arr[i]) - 1] > 0)
        arr[ abs(arr[i]) - 1] = -arr[ abs(arr[i]) - 1];
    }

    for(int i=0; i<n; i++)
        if (arr[i] > 0)
            //Returning the first index where value is positive.
            // 1 is added because index starts from 0.
            return i+1;

    return n+1;
}
```

Marking the presence of elements on their index representation. Only for the ones within bound to represent array index. But again there'd definitely index 'i' – 1 missing even if all the (+)ve are > {array size}.

Returning the first violation of the rule.