HW2_P1 - Push zero to front

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solution.cpp

```
/* Problem Analysis
Given an input array of integers, we must move all of the elements
    with a value of 0 to the front, without messing up the order of
    the other elements in the array.

*/

/* Problem Design
This can be solved by using an adopted bubble sort algorithm.
Bubble sorts work by iterating through the array and comparing each
    pair of values against each other, swapping them if the left
    value is greater than the right. Instead, we want to only swap
    the values if the right value is equal to zero.
1. Starting at the first and second elements, check if the second
    element is equal to zero.
2. If the element is equal to zero, swap the elements in the array.
3. Repeat 1-2 for every neighbor pair in the array.
4. Repeat 1-3 for N-1 times, so that it is guaranteed that all array
    elements are sorted. This is necessary if there is a zero at the
    end of the array, since it has to move it one step at a time all
    the way to the beginning of the array.

*/

#include<stdlib.h>
#include<iostream>
using namespace std;

int pushZero(int *A, int N){

    // bubble sort adopted to push zeros
    // compare each value side by side and swap zero to the left
    //     if value to the right is equal to zero
```

```
    // loop N - 1 times, so that we can completely sort the array
    for(int i = 0; i < N - 1; i++){

        // go through entire array, but factor in the fact that we
        //     are comparing two values at a time
        for(int j = 0; j < N - i - 1; j++){

            // if the value to the right is equal to zero
            if(*(A + j + 1) == 0){

                // swap
                int tempVal = *(A + j);
                *(A + j) = *(A + j + 1);
                *(A + j + 1) = tempVal;
            }
        }
    }
}

//Your program will be evaluated by this main method and several test cases.
int main(){
   int *A, N, i;
    cin >> N;
    A = (int *) malloc(sizeof(int)*N);
    for(i=0; i<N; i++)
        cin >> A[i];
    pushZero(A,N);
    for(i=0; i<N; i++)
        cout << A[i] << " ";
}
```

Name

Custom test case

Input

10 0 0 1 0 0 1 0 0 1 0

Output (Lines:2)

0 0 0 0 0 0 0 1 1 1

Expected Output (Lines:0)

Status

NA

Name
Custom test case

Input
8 8 7 6 5 4 3 0 1

Output (Lines:2)
0 8 7 6 5 4 3 1

Expected Output (Lines:0)

Status
NA

Name
Custom test case

Input
12 1 2 3 0 4 0 5 6 7 8 9 0

Output (Lines:2)
0 0 0 1 2 3 4 5 6 7 8 9

Expected Output (Lines:0)

Status
NA

Name
Default

Input
10 2 0 3 4 0 4 0 10 9 0

Output (Lines:2)
0 0 0 0 2 3 4 4 10 9

Expected Output (Lines:1)
0 0 0 0 2 3 4 4 10 9

Status

Pass