Find the number of zeroes

Given an array of 1s and 0s which has all 1s first followed by all 0s. Find the number of 0s. Count the number of zeroes in the given array.

Examples:

```
Input: arr[] = {1, 1, 1, 1, 0, 0}
Output: 2

Input: arr[] = {1, 0, 0, 0, 0}
Output: 4

Input: arr[] = {0, 0, 0}
Output: 3

Input: arr[] = {1, 1, 1, 1}
Output: 0
```

We strongly recommend to minimize the browser and try this yourself in time complexity better than O(n).

A **simple solution** is to traverse the input array. As soon as we find a 0, we return n – index of first 0. Here n is number of elements in input array. Time complexity of this solution would be O(n).

Since the input array is sorted, we can use **Binary Search** to find the first occurrence of 0. Once we have index of first element, we can return count as n – index of first zero.

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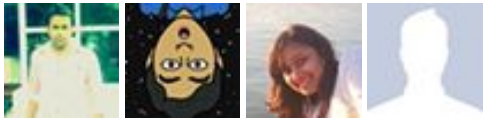

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```
// A divide and conquer solution to find count of zeroes in an array
// where all 1s are present before all 0s
#include <stdio.h>

/* if 0 is present in arr[] then returns the index of FIRST occurrence
   of 0 in arr[low..high], otherwise returns -1 */
int firstZero(int arr[], int low, int high)
{
    if (high >= low)
    {
        // Check if mid element is first 0
        int mid = low + (high - low)/2;
        if (( mid == 0 || arr[mid-1] == 1) && arr[mid] == 0)
            return mid;

        if (arr[mid] == 1)  // If mid element is not 0
            return firstZero(arr, (mid + 1), high);
        else  // If mid element is 0, but not first 0
            return firstZero(arr, low, (mid -1));
    }
    return -1;
}

// A wrapper over recursive function firstZero()
int countOnes(int arr[], int n)
{
    // Find index of first zero in given array
    int first = firstZero(arr, 0, n-1);

    // If 0 is not present at all, return 0
    if (first == -1)
        return 0;

    return (n - first);
}

/* Driver program to check above functions */
int main()
{
    int arr[] =   {1, 1, 1, 0, 0, 0, 0, 0};
    int n = sizeof(arr)/sizeof(arr[0]);
    printf("Count of zeroes is %d", countOnes(arr, n));
    return 0;
}
```

Output:

Geometric Algorithms

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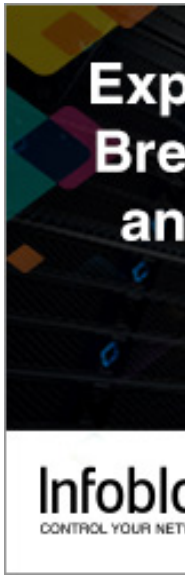
```
Count of zeroes is 5
```

Time Complexity: O(Logn) where n is number of elements in arr[].

Please write comments if you find anything incorrect, or you want to share more information about the topic discussed above



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arjomanD • 15 hours ago

As simple as locating the middle of the array :D

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karthi • 25 days ago

```
import java.io.*;

class NumberOfZeros{

public static int getNumberOfZeros(int[] a){

if(a.length == 0){

return 0;

}

int count = 0;

for(int i=a.length-1;i!=-1&&a[i]!=1;i--){

count++;

}
```

705

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Chandu Mannam • 25 days ago

```
#include<stdio.h>

int getposition(int,int,int*);

int main()

{

int a[ ]={1,1,1,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0};

int n,k;

n = sizeof(a)/sizeof(a[0]);

k = getposition(0,n,a);

printf("no of zeros=%d",n-k);

return 0;

}
```

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napender singh • a month ago

```
public class FindZero{

public static void main(String []args){
```

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▶ An Array

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```
int one = findSumOfArr(arr);

int two = findLengthOfArr(arr);

int zero = two - one;

System.out.println(zero);

}

public static int findLengthOfArr(int[] a){

int j = 0;

for(int i=0;i<a.length;i++) j++;="" return="" j;="" }="" public="" static="" int="" fin
temp="0;" for(int="" i="0;i&amp;lt;a.length;i++){" temp="temp" +="" a[i];="" }="" retur
```

:/ • a month ago

In an interview I was asked this question with the additional constraint that the
(Determining N, size, will take usually O(N)) Any ideas on how to approach thi

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You can use the idea discussed in the below post.

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coder • a month ago

i think this code will not work for an array which contains only zero. Need to ad

```
if(arr[low] == 0){
return low;
}
```

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Kartik ➚ coder • a month ago

Please take a closer look. It works for all 0s also. Sample run http://ide

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Amit • a month ago

```
#include<stdio.h>

int main()

{

int findzeros(int arr[],int n);

int arr[9]={1,0,0,1,0,0,0,0,1};

printf("Number of zeros: %d",findzeros(arr,9));

return 0;

}

int findzeros(int arr[],int n)

{

if(n>-1)
```

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Siva Krishna • a month ago

Another possible way is ..first you check in the following way
1 2 4 8 16 32 ...2^k
stop when arr[i] == 0 and then do binary search on sub array i/2 to i for finding
case complexity of O(n) and i think average case complexity is less.

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Kartik ↗ Siva Krishna • a month ago

Siva Krishna, Thanks for suggesting this. This solution can be combine
O(Logn). See http://www.geeksforgeeks.org/f...
It can in fact be a good solution if we don't know size of array.

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it may overflow the boundary of the input array

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Siva Krishna ↗ zzer • a month ago

that's an idea..not the exact implementation. You have to do so
implementing that.

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well, it's really a good idea, this idea has been used in s
of them?

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Ânon • a month ago

For thé simple solution, you return n - index + 1

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AA ➦ Ânon • a month ago

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