Codility_

CodeCheck Report: trainingSHREMS-BKF

Test Name:

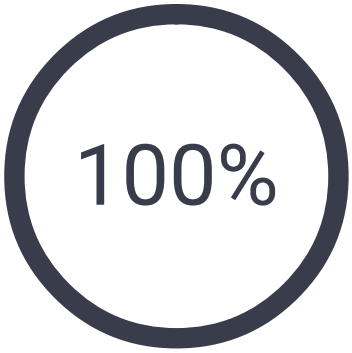
Check out Codility training tasks

Summary Timeline AI Assistant Transcript

Tasks summary

Task	Time spent	Score
Dominator C++	8 min	100%

Total score



Tasks Details

1. **Dominator**

Easy

Find an index of an array such that its value occurs at more than half of indices in the array.

Task Score	Correctness	Performance
100%	100%	100%

Task description

An array A consisting of N integers is given. The *dominator* of array A is the value that occurs in more than half of the elements of A.

For example, consider array A such that

```
A[0] = 3    A[1] = 4    A[2] =  3
A[3] = 2    A[4] = 3    A[5] = -1
A[6] = 3    A[7] = 3
```

The dominator of A is 3 because it occurs in 5 out of 8 elements of A (namely in those with indices 0, 2, 4, 6 and 7) and 5 is more than a half of 8.

Write a function

```
int solution(vector<int> &A);
```

that, given an array A consisting of N integers, returns index of any element of array A in which the dominator of A occurs. The function should return −1 if array A does not have a dominator.

For example, given array A such that

```
A[0] = 3    A[1] = 4    A[2] =  3
A[3] = 2    A[4] = 3    A[5] = -1
```

Solution

Programming language used:	C++
Total time used:	8 minutes
Effective time used:	8 minutes
Notes:	*not defined yet*

Task timeline

07:20:17 07:28:16

Code: 07:28:16 UTC, cpp, final, score: **100** show code in pop-up

```
1  // you can use includes, for example:
2  // #include <algorithm>
```

```
A[6] = 3    A[7] = 3
```

the function may return 0, 2, 4, 6 or 7, as explained above.

Write an **efficient** algorithm for the following assumptions:

- N is an integer within the range [0..100,000];
- each element of array A is an integer within the range [−2,147,483,648..2,147,483,647].


```
3
4  // you can write to stdout for debugging purpo
5  // cout << "this is a debug message" << endl;
6
7  int solution(vector<int> &A) {
8      int c;
9
10 //맞춰볼 숫자가 있는 상황인지 확인하기 위해 size 선언
11     int size = 0;
12     for (int a : A) {
13         if (size == 0) {
14             c = a;
15             size = 1;
16         }
17         else {
18             if (c == a) {
19                 size++;
20             } else {
21                 size--;
22             }
23         }
24     }
25 //The dominator of array A is the value that o
26     int count = 0;
27     int index;
28
29     for (int i = 0; i < A.size(); i++) {
30         if (A[i] == c) {
31             count++;
32             index = i;
33         }
34     }
35
36     if (count > A.size()/2)
37         return index;
38
39     return -1;
40 }
```

Analysis summary

The solution obtained perfect score.

Analysis

Detected time complexity: **O(N*log(N)) or O(N)**

expand all	Example tests	
▶	example example test	✔ OK
expand all	Correctness tests	
▶	small_nondominator all different and all the same elements	✔ OK
▶	small_half_positions half elements the same, and half + 1 elements the same	✔ OK
▶	small small test	✔ OK
▶	small_pyramid decreasing and plateau, small	✔ OK
▶	extreme_empty_and_single_item empty and single element arrays	✔ OK

▶	extreme_half1 array with exactly N/2 values 1, N even + [0,0,1,1,1]	✔ OK
▶	extreme_half2 array with exactly floor(N/2) values 1, N odd + [0,0,1,1,1]	✔ OK
▶	extreme_half3 array with exactly ceil(N/2) values 1 + [0,0,1,1,1]	✔ OK

expand all **Performance tests**

▶	medium_pyramid decreasing and plateau, medium	✔ OK
▶	large_pyramid decreasing and plateau, large	✔ OK
▶	medium_random random test with dominator, N = 10,000	✔ OK
▶	large_random random test with dominator, N = 100,000	✔ OK