Codility_

CodeCheck Report: training2EC5VV-P62

Test Name:

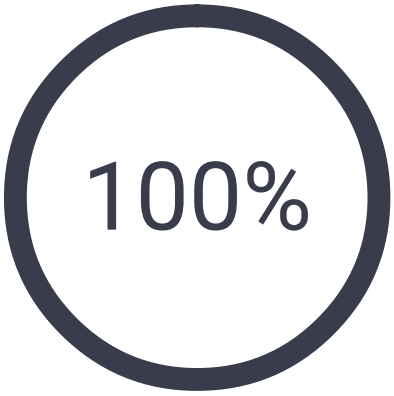
Check out Codility training tasks

Summary Timeline AI Assistant Transcript

Tasks summary

Task	Time spent	Score
MaxProfit C++	34 min	100%

Total score



Tasks Details

1. **MaxProfit**

Easy

Given a log of stock prices compute the maximum possible earning.

Task Score	Correctness	Performance
100%	100%	100%

Task description

An array A consisting of N integers is given. It contains daily prices of a stock share for a period of N consecutive days. If a single share was bought on day P and sold on day Q, where 0 ≤ P ≤ Q < N, then the *profit* of such transaction is equal to A[Q] − A[P], provided that A[Q] ≥ A[P]. Otherwise, the transaction brings *loss* of A[P] − A[Q].

For example, consider the following array A consisting of six elements such that:

Solution

Programming language used:	C++
Total time used:	34 minutes
Effective time used:	34 minutes
Notes:	*not defined yet*

```
A[0] = 23171
A[1] = 21011
A[2] = 21123
A[3] = 21366
A[4] = 21013
A[5] = 21367
```

If a share was bought on day 0 and sold on day 2, a loss of 2048 would occur because A[2] − A[0] = 21123 − 23171 = −2048. If a share was bought on day 4 and sold on day 5, a profit of 354 would occur because A[5] − A[4] = 21367 − 21013 = 354. Maximum possible profit was 356. It would occur if a share was bought on day 1 and sold on day 5.

Write a function,

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

that, given an array A consisting of N integers containing daily prices of a stock share for a period of N consecutive days, returns the maximum possible profit from one transaction during this period. The function should return 0 if it was impossible to gain any profit.

For example, given array A consisting of six elements such that:

```
A[0] = 23171
A[1] = 21011
A[2] = 21123
A[3] = 21366
A[4] = 21013
A[5] = 21367
```

the function should return 356, as explained above.

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

- N is an integer within the range [0..400,000];
- each element of array A is an integer within the range [0..200,000].

Task timeline

09:17:47 09:51:22

Code: 09:51:22 UTC, cpp, final, score: **100** show code in pop-up

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

// you can write to stdout for debuggin
// cout << "this is a debug message" <<

int solution(vector<int> &A) {
    //저점에 사서 고점에 팔기
    //이익 반환
    int size = A.size();

    if (size < 2) return 0;

    int e = 0;
    int s = 0;

    for (int i = 1; i < size; i++) {
        int profix = A[i] - A[i-1];
        e = max(e+profix, 0);
        s = max(e, s);
    }

    return s;
}
```

Analysis summary

The solution obtained perfect score.

Analysis

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

expand all	Example tests	
▶	example example, length=6	✔ OK
expand all	Correctness tests	
▶	simple_1 V-pattern sequence, length=7	✔ OK
▶	simple_desc descending and ascending sequence, length=5	✔ OK
▶	simple_empty empty and [0,200000] sequence	✔ OK

▶	two_hills two increasing subsequences	✔ OK
▶	max_profit_after_max_and_before_min max profit is after global maximum and before global minimum	✔ OK

expand all Performance tests

▶	medium_1 large value (99) followed by short V-pattern (values from [1..5]) repeated 100 times	✔ OK
▶	large_1 large value (99) followed by short pattern (values from [1..6]) repeated 10K times	✔ OK
▶	large_2 chaotic sequence of 200K values from [100K..120K], then 200K values from [0..100K]	✔ OK
▶	large_3 chaotic sequence of 200K values from [1..200K]	✔ OK