Codility_

CodeCheck Report: trainingABKX4X-VW3

Test Name:

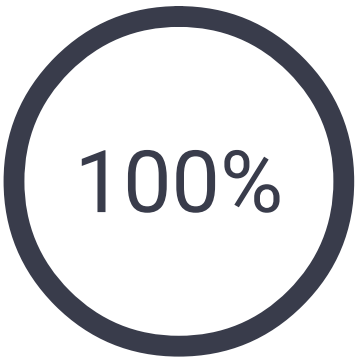
Check out Codility training tasks

Summary | Timeline

Tasks summary

Task	Time spent	Score
Nesting C# ⚠	5 min	100%

Total score



Tasks Details

Easy

1. Nesting

Determine whether a given string of parentheses (single type) is properly nested.

Task Score	Correctness	Performance
100%	100%	100%

Task description

A string S consisting of N characters is called *properly nested* if:

- S is empty;
- S has the form "(U)" where U is a properly nested string;
- S has the form "VW" where V and W are properly nested strings.

For example, string "(()(()))()" is properly nested but string "())" isn't.

Write a function:

```
class Solution { public int solution(string S); }
```

that, given a string S consisting of N characters, returns 1 if string S is properly nested and 0 otherwise.

For example, given S = "(()(()))()", the function should return 1 and given S = "())", the function should return 0, as explained

Solution

Programming language used:	C#
Total time used:	5 minutes
Effective time used:	5 minutes
Notes:	*not defined yet*

Task timeline

07:50:07 07:54:39

above.

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

- N is an integer within the range [0..1,000,000];
- string S is made only of the characters "(" and/or ")".

Code: 07:54:39 UTC, cs, final, score: **100** show code in pop-up

```
using System;

/**
 * 7.3 - Nesting
 * Paulo Santos
 * 09.Dec.2022
 */
class Solution {
    public int solution(string S) {

        /*
         * I don't usually editorialize on this
         * lessons, but this one I had to.
         *
         * Lesson 7.3 is ridiculously dimilar to 7.
         *
         * Just saying.
         */

        var cnt = 0;
        var isOpen = false;
        foreach(var c in S) {
            if (c == ')') {
                if (!isOpen)
                    return 0;

                cnt -= 1;
                isOpen = (cnt > 0);
                continue;
            }
            if (c == '(') {
                cnt += 1;
                isOpen = true;
            }
        }

        return (cnt == 0) ? 1 : 0;
    }
}
```

Analysis summary

The solution obtained perfect score.

Analysis

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

expand all	Example tests	
▶	example1 example test	✓ OK
▶	example2 example test2	✓ OK
expand all	**Correctness tests**	
▶	negative_match invalid structure, but the number of parentheses matches	✓ OK

▶	empty empty string	✓ OK
▶	simple_grouped simple grouped positive and negative test, length=22	✓ OK
▶	small_random	✓ OK

expand all **Performance tests**

▶	large1 simple large positive and negative test, 10K or 10K+1 ('s followed by 10K)'s	✓ OK
▶	large_full_ternary_tree tree of the form T=(TTT) and depth 11, length=177K+	✓ OK
▶	multiple_full_binary_trees sequence of full trees of the form T=(TT), depths [1..10..1], with/without unmatched ')' at the end, length=49K+	✓ OK
▶	broad_tree_with_deep_paths string of the form (TTT...T) of 300 T's, each T being '(((...)))' nested 200-fold, length=1 million	✓ OK