Codility_

CodeCheck Report: training22KHHD-ED6

Test Name:

Check out Codility training tasks

Summary | Timeline

Tasks summary

Task	Time spent	Score
Brackets C#	22 min	100%

Total score

Tasks Details

Easy

1. Brackets

Determine whether a given string of parentheses (multiple types) is properly nested.

Task Score	Correctness	Performance
100%	100%	100%

Task description

A string S consisting of N characters is considered to be *properly nested* if any of the following conditions is true:

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

For example, the string "{[()()]}" is properly nested but "([)()]" is not.

Write a function:

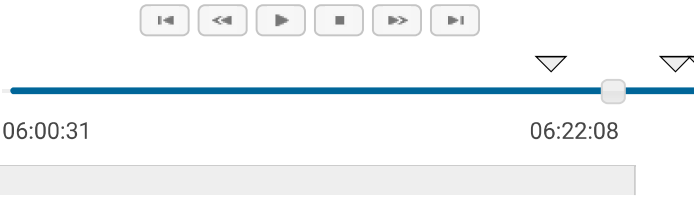
```
class Solution { public int solution(string S); }
```

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

Solution

Programming language used:	C#
Total time used:	22 minutes
Effective time used:	22 minutes
Notes:	*not defined yet*

Task timeline



For example, given S = "{[()()]}", the function should return 1 and given S = "([)()]", the function should return 0, as explained above.

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

- N is an integer within the range [0..200,000];
- string S is made only of the following characters: "(", "{", "[", "]", "}" and/or ")".

Code: 06:22:08 UTC, cs, final, score: **100** show code in pop-up

```
using System;
using System.Collections.Generic;

/**
 * 7.1 - Brackets
 * Paulo Santos
 * 09.Dec.2022
 */
class Solution {

    const string bracketOpen  = "{[(";
    const string bracketClose = "}])";

    public int solution(string S) {

        var pos = 0;
        var isOpen = false;
        var bracketStack = new Stack<char>();

        foreach (var c in S) {
            if (!isOpen && (bracketClose.IndexOf(c)
                return 0;

            if (isOpen && (bracketClose.IndexOf(c)
                if (c != bracketStack.Peek())
                    return 0;

                bracketStack.Pop();
                isOpen = (bracketStack.Count != 0);
                continue;
            }
            if ((pos = bracketOpen.IndexOf(c)) != -
                bracketStack.Push(bracketClose[pos]
                isOpen = true;
            }
        }

        return (bracketStack.Count == 0) ? 1 : 0;

    }
}
```

Analysis summary

The solution obtained perfect score.

Analysis

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

expand all	Example tests	
▶	example1 example test 1	✓ OK
▶	example2 example test 2	✓ OK
expand all	Correctness tests	
▶		

negative_match invalid structures	✓ OK	
▶ empty empty string	✓ OK	
▶ simple_grouped simple grouped positive and negative test, length=22	✓ OK	
expand all	**Performance tests**	
▶ large1 simple large positive test, 100K ('s followed by 100K)'s +)(	✓ OK	
▶ large2 simple large negative test, 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 some brackets 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=120K+	✓ OK	