Codility_

CodeCheck Report: trainingDZFEBH-JXN

Test Name:

Check out Codility training tasks

Summary Timeline

Tasks summary

Task	Time spent	Score
FrogRiverOne C#	1 min	100%

Total score

100%

Tasks Details

Easy

1. FrogRiverOne

Find the earliest time when a frog can jump to the other side of a river.

Task Score	Correctness	Performance
100%	100%	100%

Task description

A small frog wants to get to the other side of a river. The frog is initially located on one bank of the river (position 0) and wants to get to the opposite bank (position X+1). Leaves fall from a tree onto the surface of the river.

You are given an array A consisting of N integers representing the falling leaves. A[K] represents the position where one leaf falls at time K, measured in seconds.

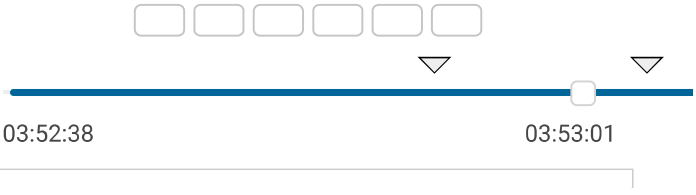
The goal is to find the earliest time when the frog can jump to the other side of the river. The frog can cross only when leaves appear at every position across the river from 1 to X (that is, we want to find the earliest moment when all the positions from 1 to X are covered by leaves). You may assume that the speed of the current in the river is negligibly small, i.e. the leaves do not change their positions once they fall in the river.

For example, you are given integer X = 5 and array A such that:

Solution

Programming language used:	C#
Total time used:	1 minutes
Effective time used:	1 minutes
Notes:	*not defined yet*

Task timeline



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

In second 6, a leaf falls into position 5. This is the earliest time when leaves appear in every position across the river.

Write a function:

```
class Solution { public int solution(int X,
int[] A); }
```

that, given a non-empty array A consisting of N integers and integer X, returns the earliest time when the frog can jump to the other side of the river.

If the frog is never able to jump to the other side of the river, the function should return −1.

For example, given X = 5 and array A such that:

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

the function should return 6, as explained above.

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

- N and X are integers within the range [1..100,000];
- each element of array A is an integer within the range [1..X].

Code: 03:53:00 UTC, cs, final, score: **100** show code in pop-up

```
1  using System;
2  using System.Linq;
3  using System.Collections.Generic;
4
5  /* Lesson 4.1 - Frog River One
6   * Paulo Santos
7   * 24.Nov.2022
8   */
9  class Solution {
10     public int solution(int X, int[] A) {
11
12         /*
13          * Check the input
14          */
15         if (A == null)
16             throw new ArgumentNullException();
17
18         var riverLen = (X);
19         var river = new Dictionary<int, int>();
20         var ans = -1;
21         var cnt = 0;
22         for(var i = 0; i < A.Length; i++) {
23             var rp = A[i] - 1;
24             if (!river.ContainsKey(rp)) {
25                 river[rp] = i;
26                 cnt +=1;
27             }
28             else {
29                 river[rp] = Math.Min(i + 1, river
30             }
31
32             if (cnt > riverLen)
33                 break;
34         }
35
36         for(var i = 0; i < riverLen; i ++)
37             if (!river.ContainsKey(i))
38                 return -1;
39
40
41         ans = river.Select(r => r.Value).Max();
42         return ans;
43     }
44 }
```

Analysis summary

The solution obtained perfect score.

Analysis

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

expand all	Example tests	
▶	example example test	✓ OK
expand all	Correctness tests	

▶	simple simple test	✓ OK
▶	single single element	✓ OK
▶	extreme_frog frog never across the river	✓ OK
▶	small_random1 3 random permutation, X = 50	✓ OK
▶	small_random2 5 random permutation, X = 60	✓ OK
▶	extreme_leaves all leaves in the same place	✓ OK

expand all Performance tests

▶	medium_random 6 and 2 random permutations, X = ~5,000	✓ OK
▶	medium_range arithmetic sequences, X = 5,000	✓ OK
▶	large_random 10 and 100 random permutation, X = ~10,000	✓ OK
▶	large_permutation permutation tests	✓ OK
▶	large_range arithmetic sequences, X = 30,000	✓ OK