# cødility

Training center

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#### Demo ticket

#### Session

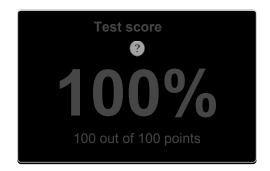
ID: demoRBDFW9-6AY Time limit: 120 min.

#### Status: closed

Created on: 2014-03-17 05:11 UTC Started on: 2014-03-17 05:11 UTC Finished on: 2014-03-17 05:12 UTC

#### Tasks in test

Task score



### <u>≥</u>

#### 1. Ladder

Count the number of different ways of climbing to the top of a ladder.





#### Task description

You have to climb up a ladder. The ladder has exactly N rungs, numbered from 1 to N. With each step, you can ascend by one or two rungs. More precisely:

- with your first step you can stand on rung 1 or 2,
- if you are on rung K, you can move to rungs K + 1 or K + 2.
- finally you have to stand on rung N.

Your task is to count the number of different ways of climbing to the top of the ladder.

For example, given N = 4, you have five different ways of climbing, ascending by:

- 1, 1, 1 and 1 rung,
- 1, 1 and 2 rungs,
- 1, 2 and 1 rung,
- 2, 1 and 1 rungs, and
- 2 and 2 rungs.

Given N = 5, you have eight different ways of climbing, ascending by:

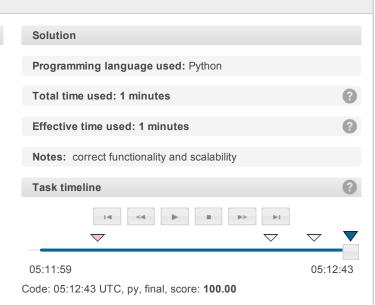
- 1, 1, 1, 1 and 1 rung,
- 1, 1, 1 and 2 rungs,
- 1, 1, 2 and 1 rung,1, 2, 1 and 1 rung,
- 1, 2 and 2 rungs,
- 2, 1, 1 and 1 rungs,
- 2, 1 and 2 rungs, and
- 2, 2 and 1 rung.

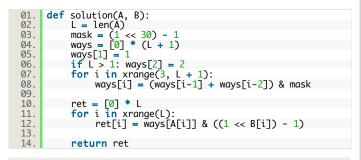
The number of different ways can be very large, so it is sufficient to return the result modulo  $2^P$ , for a given integer P.

Write a function:

def solution(A, B)

that, given two non-empty zero-indexed arrays A and B of L integers, returns an array consisting of L integers specifying the consecutive





## Detected time complexity:

**Analysis** 

#### 3/17/2014

answers; position I should contain the number of different ways of climbing the ladder with A[I] rungs modulo  $2^{B[I]}$ . For example, given L = 5 and:

A[0] = 4 B[0] = 3 A[1] = 4 B[1] = 2 A[2] = 5 B[2] = 4 A[3] = 5 B[3] = 3 A[4] = 1 B[4] = 1

the function should return the sequence [5, 1, 8, 0, 1], as explained above.

#### Assume that:

- L is an integer within the range [1..30,000];
- each element of array A is an integer within the range [1..L];
- each element of array B is an integer within the range [1..30].

#### Complexity:

- expected worst-case time complexity is O(L);
- expected worst-case space complexity is O(L), beyond input storage (not counting the storage required for input arguments).

Elements of input arrays can be modified.

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#### Codility

test	time	result
example example test	0.050 s.	ок
extreme extreme small values	0.050 s.	ок
small_functional small functional	0.050 s.	ок
small small tests	0.050 s.	ок
small_random small random, length = ~100	0.050 s.	ок
medium_random medium random, length = ~1,000	0.050 s.	ок
large_range large range, length = ~30,000	0.220 s.	ок
large_random large random, length = ~30,000	0.220 s.	ок
extreme_large all max size of the ladder	0.220 s.	ок

#### Training center

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