Distributed Finals 2015

A. Testrun
B. kolakoski
C. necklace
D. rocks
E. shipping

Contest Analysis
Questions asked 2

Submissions

Testrun
0pt | Not attempted
0/6 users correct (0%)

kolakoski
8pt | Not attempted
5/7 users correct (71%)
17pt | Not attempted
2/5 users correct (40%)

necklace
16pt | Not attempted
10/10 users correct (100%)
29pt | Not attempted
9/10 users correct (90%)

rocks
7pt | Not attempted
2/2 users correct (100%)
53pt | Not attempted
0/1 users correct (0%)

shipping
26pt | Not attempted
2/6 users correct (33%)
44pt | Not attempted
0/1 users correct (0%)

Top Scores

bmerry	103
Marcin.Smulewicz	71
shik	70
MiSawa	60
ZbanIlya	53
WJMZBMR	45
simonlindholm	45
mk.al13n	45
wan92hy	45
dreamoon	24

Problem B. kolakoski

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

small 8 points *2 minute timeout*	The contest is finished.
large 17 points *10 minute timeout*	The contest is finished.

Problem

The Kolakoski sequence is defined as follows, where A(i) is the i-th term in the sequence:

- A(0) = 1
- A(1) = 2
- The sequence is composed entirely of alternating runs of 1's and 2's
- A(i) is the length of the i-th run.

This completely and uniquely defines the sequence.

The first twenty terms of the sequence are as follows, where the lines mark the alternating runs of 1's and 2's:

1 2 2 1 1 2 1 2 2 1 2 2 1 1 2 1 1 2 2 1

1 2 2 1 1 2 1 2 2 1 2 1 1 2 1 2 2 1

By collecting the lengths of each run, we obtain the same sequence again.

You become mystified contemplating the elegance of the Kolakoski sequence and after staring at its 1's and 2's for far too long, you begin to wonder if maybe you should spice it up a little and introduce some more numerical variety to the terms.

So you decide to assign an arbitrary coefficient to each index in a manner such as the following:

C(0)=1
C(1)=3
C(2)=1
C(3)=5
C(4)=2
C(5)=2

By multiplying the first 6 terms each by their coefficient and summing, we get

1*1 + 3*2 + 1*2 + 5*1 + 2*1 + 2*2 = 20.

Given a mapping from index to coefficient, find the dot product of the first **N** terms of the Kolakoski sequence and their respective coefficients.

Input

The library "kolakoski" will contain two functions:

- GetIndex() which returns **N**, the number of terms we wish to sum; and
- GetMultiplier(i) which takes an index i and returns the coefficient (a number from 0 to 50) for that index.

A single call to GetMultiplier will take approximately 0.005 microseconds.

Output

Output one number: the weighted sum of the elements of the Kolakoski sequence.

Limits

Each node will have access to 700MB of RAM.
Your solution will run on 100 nodes in both inputs.

Small input

GetMultiplier(i) will always return 1, for all the inputs.
$1 \le \text{GetIndex}() \le 10^9$
Each node will have a time limit of 10 seconds.

Large input

$1 \le$ GetMultiplier(i) ≤ 50 for all i
$1 \le$ GetIndex() $\le 3 \times 10^9$
Each node will have a time limit of 12 seconds.

Sample

Input	Output
See below for sample input files.	For sample input 1: 1 For sample input 2: 15 For sample input 3: 50

Sample input libraries:
Sample input for test 1: kolakoski.h [CPP] kolakoski.java [Java]
Sample input for test 2: kolakoski.h [CPP] kolakoski.java [Java]
Sample input for test 3: kolakoski.h [CPP] kolakoski.java [Java]