Contest Analysis

Questions asked 3

– Top Scores

fagu	100
bmerry	100
krijgertje	100
ecnerwala	100
pashka	100
Swistakk	100
KalininN	100
adsz	100
Gennady.Korotkevich	100
eatmore	100

Problem B. flagpoles

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 1 points *2 minute timeout* | The contest is finished. |
| large 11 points *10 minute timeout* | The contest is finished. |

Problem

Flagpoles

Cody-Jamal, the famous conceptual artist, was called to design the new United Nations headquarters. The entrance displays a single row of flagpoles with the flags of different countries. Each flagpole is exactly 1 meter away from its neighbor(s). Since different nations have different rules about how high their flags must be flown, the tips of the flagpoles may have different heights.

The scientists from the famous Detecting Collinearity Journal have become interested in the flagpoles. In particular, they want to know the maximum number of consecutive flagpoles with tips that are collinear. A set of contiguous flagpoles has collinear tips if there is a constant d such that, for every pair of adjacent flagpoles in the set, the height of the right flagpole's tip minus the height of the left flagpole's tip is equal to d. Notice that the condition is always true for a set of up to 2 flagpoles.

For example, if the flagpoles' heights are 5, 7, 5, 3, 1, 2, 3, in left-to-right order, the leftmost 2 flagpoles and the rightmost 3 flagpoles are examples of consecutive sets of flagpoles with collinear tips. The flagpoles with heights 7 and 1, together with those in between them, are another example. The leftmost 3 flagpoles, however, do not have collinear tips, so they do not form such a set.

Given the height in meters of each flagpole tip, in the left-to-right order in which they appear, can you help the DCJ calculate the maximum size of a set of consecutive flagpoles with collinear tips?

Input

The input library is called "flagpoles"; see the sample inputs below for examples in your language. It defines two methods:

- **GetNumFlagpoles()**:
  - Takes no argument.
  - Returns a 64-bit integer: the number of flagpoles in the row.
  - Expect each call to take 0.17 microseconds.
- **GetHeight(i)**:
  - Takes exactly one 64-bit integer argument: a position i, $0 \le i <$ GetNumFlagpoles().
  - Returns a 64-bit integer: the height, in meters, of the flagpole at the ith position from left to right. The ith flagpole is always i meters to the right of the 0th flagpole.
  - Expect each call to take 0.17 microseconds.

Output

Output one line with a single integer: the maximum number of consecutive flagpoles with collinear top ends.

Limits

Time limit: 3 seconds.
Memory limit per node: 512 MB.
Maximum number of messages a single node can send: 1000.
Maximum total size of messages a single node can send: 8 MB.
$1 \le$ GetHeight(i) $\le 10^{18}$.

Small dataset

Number of nodes: 10.
$1 \le$ GetNumFlagpoles() $\le 10^6$.

Large dataset

Number of nodes: 100.
$1 \le$ GetNumFlagpoles() $\le 10^9$.

Sample

Input	Output
See input files below.	For sample input 1: 4 For sample input 2: 4 For sample input 3: 2

Sample input 1 is the example given in the problem statement.

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