# Task: MEA

**Official English Version**

# Mean Sequence

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**Day 1. Source file** `mea.*` *Saturday, 20–08–2005*

**Available memory: 16 MB. Maximum running time: 5 s.**

Consider a nondecreasing sequence of integers $s_1, \ldots, s_{n+1}$ ($s_i \leq s_{i+1}$ for $1 \leq i \leq n$). The sequence $m_1, \ldots, m_n$ defined by $m_i = \frac{1}{2}(s_i + s_{i+1})$, for $1 \leq i \leq n$, is called the *mean sequence* of sequence $s_1, \ldots, s_{n+1}$. For example, the mean sequence of sequence 1, 2, 2, 4 is the sequence 1.5, 2, 3. Note that elements of the mean sequence can be fractions. However, this task deals with mean sequences whose elements are integers only.

Given a nondecreasing sequence of $n$ integers $m_1, \ldots, m_n$, compute the number of nondecreasing sequences of $n+1$ integers $s_1, \ldots, s_{n+1}$ that have the given sequence $m_1, \ldots, m_n$ as mean sequence.

## Task

Write a program that:

- reads from the standard input a nondecreasing sequence of integers,
- calculates the number of nondecreasing sequences, for which the given sequence is mean sequence,
- writes the answer to the standard output.

## Input

The first line of the standard input contains one integer $n$ ($2 \leq n \leq 5\,000\,000$). The remaining $n$ lines contain the sequence $m_1, \ldots, m_n$. Line $i+1$ contains a single integer $m_i$ ($0 \leq m_i \leq 1\,000\,000\,000$). You can assume that in 50% of the test cases $n \leq 1\,000$ and $0 \leq m_i \leq 20\,000$.

## Output

Your program should write to the standard output exactly one integer — the number of nondecreasing integer sequences, that have the input sequence as the mean sequence.

## Example

For the input data:

```
3
2
5
9
```

the correct result is:

```
4
```

Indeed, there are four nondecreasing integer sequences for which $2, 5, 9$ is the mean sequence. These sequences are:

- $2, 2, 8, 10$,
- $1, 3, 7, 11$,
- $0, 4, 6, 12$,
- $-1, 5, 5, 13$.