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 $n$ ($2 \leq n \leq 5000000$). The remaining $n$ lines contain the sequence $m_1, \ldots, m_n$. Line $i+1$ contains a single integer $m_i$ ($0 \leq m_i \leq 1000000000$). You can assume that in 50% of the test cases $n \leq 1000$ and $0 \leq m_i \leq 20000$.

**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.