Zigzag

A sequence of integers is said to *Zigzag* if adjacent elements alternate between strictly increasing and strictly decreasing. Note that the sequence may start by either increasing or decreasing. Given a sequence of integers, determine the length of the longest subsequence that *Zigzags*. For example, consider this sequence:

1 2 3 4 2

There are several *Zigzagging* subsequences of length **3**:

1 3 2 **1 4 2** **2 3 2** **2 4 2** **3 4 2**

But there are none of length greater than **3**, so the answer is **3**.

Input

Each input will consist of a single test case. Note that your program may be run multiple times on different inputs. The first line of input contains an integer ***n*** (**1≤*n*≤1,000,000**) which is the number of integers in the list. Each of the following ***n*** lines will have an integer ***k*** (**1≤*k*≤1,000,000**)

Output

Output a single integer, which is the length of the longest *Zigzagging* subsequence of the input list.

Sample Input	**Sample Output**
5 1 2 3 4 2	3
6 1 1 1 1 1 1	1