Problem D. 2-LIS

- Time Limit: 2 sec

Problem Statement

You are given an integer sequence $A = (a_1, a_2, \ldots, a_N)$. Find the length of the longest sequence $B = (b_1, b_2, \ldots, b_M)$ which satisfies the following two conditions:

- B is a subsequence of A
- $b_i < b_{i+2}$ for all i $(1 \leq i \leq M - 2)$

A subsequence of a sequence is a sequence obtained by removing zero or more elements from the original sequence and then concatenating the remaining elements without changing the order.

Input

N
a_1 a_2 $\ldots$ a_N

The first line consists of an integer N between 1 and 5,000, inclusive. This represents the number of elements in A.

The second line consists of N integers between 1 and N, inclusive. For each i $(1 \leq i \leq N)$, a_i represents the i-th element of A.

Output

Print the answer in a line.

Sample Input 1	Sample Output 1
7 1 5 7 6 3 4 2	4

Sample Input 2	Sample Output 2
7 6 2 1 4 7 5 3	5

Sample Input 3	Sample Output 3
2 2 1	2

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