The Longest increasing subsequence

Problem Statement

An Introduction to the Longest Increasing Subsequence Problems

The task is to find the length of the longest subsequence in a given array of integers such that all elements of the subsequence are sorted in ascending order. For example, the length of the LIS for { 15, 27, 14, 38, 26, 55, 46, 65, 85 } is 6 and the longest increasing subsequence is {15, 27, 38, 55, 65, 85}.

Here's a great Youtube video of a lecture from MIT's Open-Coursware, covering the topic.

Please note, that we are interested in **ascending order** not **strictly ascending**.

In this challenge you simply have to find the longest increasing sub-sequence of the given sequence.

Input Format

In the first line of input, there is a single number N.
In the next N lines input the value of $a[i]$.

Constraints
$1 \leq N \leq 10^6$
$1 \leq a[i] \leq 10^5$

Output Format

In a single line, output the length of the longest increasing sub-sequence.

Sample Input

```
5
2
7
4
3
8
```

Sample Output

```
3
```

Explanation

{2,7,8} is the longest increasing sub-sequence, hence the answer is 3 (the length of this sub-sequence).