Elder price robot

Problem ID: elderpricerobot

The idea behind your latest business adventure, BarGain Overview (BGO), is to collect the history of prices for a certain item that is available for sale on the web. The *BarGain score* of a particular day is defined as the number of days since the price was lower or equal to today's price. The worst BarGain score is thus 1, and if the price is strictly better than all previous prices ever recorded, then it is `infinity`. You want to report the BarGain score to your customers to help them identify a good buy.

Input

The first line of input contains a single integer $2 \leq n \leq 400\,000$, the number of days for which you have collected price data for the item. On the second line of input follows n space-separated integers $p_1, p_2, \ldots, p_n$, where $0 \leq p_i \leq 10^6$ is the price of the item $i - 1$ days ago. Today's price is p_1.

Output

Output n rows, one for each day you have collected price data for the item. On the i^{th} such line, output the BarGain score for the day that was $i - 1$ days ago.

Sample Input 1	Sample Output 1
6 9 10 11 9 12 11	3 2 1 infinity 1 infinity