Problem A. Almost Longest Increasing Subsequence

Input file:	*standard input*
Output file:	*standard output*
Time limit:	5 seconds
Memory limit:	256 mebibytes

This is an interactive problem.

Suppose you are given a permutation a of n numbers from 1 to n. In a usual task you would have to find its *longest increasing subsequence*: indices $i_1, \ldots, i_k$ such that $i_1 < \ldots < i_k$ and $a_{i_1} < \ldots < a_{i_k}$, where k is maximum possible.

However, this time the task is different: the numbers are given **online**, so you must decide whether you take the number or not before you receive the next number. You also know that the input permutation is **random**, that is, selected uniformly at random from the set of all $n!$ possible permutations. Under these requirements it is impossible to surely find the longest increasing subsequence, but you have to just do good enough. Formally, let k be the length of the longest increasing subsequence of the given permutation. Then, finding any increasing subsequence of length at least $0.65k$ will suffice.

Interaction Protocol

First, interactor sends a single number n ($n = 10^5$) which is the length of the permutation. Next, interactor sends n numbers one by one, each on a separate line. After receiving each number you should print one integer to the standard output, which is 1 if you take the given number and 0 otherwise.

The sequence given is a permutation of $1, \ldots, n$: all elements are distinct and each of then is from 1 to n.

Every number selected by participant (except for the first one) should be greater than the previous one.

In the sample case $n = 5$. Any solution which follows the output format passes this testcase.

Example

standard input	standard output
5 2 1 5 4 3 	 1 0 1 0 0

Note

The sample test is used only to illustrate the interaction format and is not included in the testset. Each test from the testset has $n = 10^5$.

In this problem, technically, a *random permutation* is an array of $1, \ldots, n$ shuffled with some pseudo-random number generator.