Problem D

Detailed Sorting Machine

In computer science, a sorting algorithm is an algorithm that puts elements of a list in a certain order. The most frequently used orders are numerical order and lexicographical order. Efficient sorting is important for optimizing the efficiency of other algorithms (such as search and merge algorithms) that require input data to be in sorted lists. Sorting is also often useful for canonicalizing data and for producing human-readable output. More formally, the output of any sorting algorithm must satisfy two conditions:

- The output is in nondecreasing order (each element is no smaller than the previous element according to the desired total order);
- The output is a permutation (a reordering, yet retaining all of the original elements) of the input.

Your school is running the Sorting Algorithms Week (SAW), in this week some clever engineers create clever machines to demonstrate how sorting algorithms work in a more physical way. This years winner created a machine that not only performed sorting but allowed people to interact with the machine to better understand the whole sorting process. As usual the winner will present the machine to the crowd.

The machine has a display where N boxes can be seen sitting on N positions numbered from 1 to N in a straight line from left to right, each box has a number B_i drawn and visible to the espectators of the show. The way people interacts with the machine is through N buttons that are on the outside of the machine, the buttons are numbered from 1 to N and are aligned to the positions where the boxes sit so that the button with the number 1 is aligned with the first (leftmost) position, the second button is aligned with the second position, ..., and the $N-th$ button is aligned with the $N-th$ (rightmost) position. When a person pushes the $i-th$ button, the box at the $i-th$ position in the machine is lifted by a crane, all other boxes are moved one place to the left, and the box that was lifted is put down on the $N-th$ position.

The engineer who created the machine claims there are several ways to push the buttons so that the numbers drawn on the boxes are sorted in ascending order. Given the number of boxes and the values B_i each box has visible before any button has been pressed. Can you find the minimum number of times the buttons should be pressed to sort the values drawn in the boxes in ascending order?

Input

The first line of input contains a single integer number N ($1 \leq N \leq 10^5$), representing the number of boxes in the machine. The second and last line contains N integer numbers separated by a space, where the $i-th$ number represents the value B_i ($1 \leq B_i \leq 10^6$) drawn in the box sitting on the $i-th$ position of the machine.

Output

Print a single line with a single integer, representing the minimum number of times the buttons should be pressed to sort the values drawn in the boxes in ascending order.

Input example 1	**Output example 1**
5 1 3 5 7 9	0

Input example 2	**Output example 2**
5 1 3 4 5 2	3