JETBRAINS icpc global sponsor programming tools
HUAWEI icpc diamond multi-regional sponsor
Jane Street icpc platinum multi-regional sponsor
Jump TRADING icpc gold sponsor

Problem K
Book Sorting
Time limit: 2 seconds

You have n books arranged from left to right on a bookshelf. These books are uniquely labeled from 1 to n. The i-th book from the left is labeled p_i. You want to sort the books so that their labels are in ascending order from left to right.

In one step, you can perform one of the following actions:

- Choose two adjacent books and swap them.
- Choose one book and move it to the leftmost position.
- Choose one book and move it to the rightmost position.

Compute the minimum number of steps required to sort the books.

Input

The first line of input contains an integer n ($2 \leq n \leq 500\,000$). The second line contains n pairwise distinct integers $p_1, p_2, \ldots, p_n$ ($1 \leq p_i \leq n$).

Output

Output the minimum number of steps to sort the books in ascending order from left to right by their labels.

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

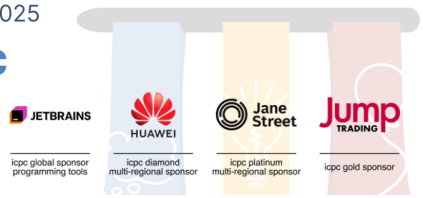
Explanation for the sample input/output #1

You can do the following three steps in order: swap the books labeled 2 and 1, swap the books labeled 4 and 3, and move the book labeled 6 to the rightmost position.

6 2 1 4 3 5 → 6 **1** **2** 4 3 5 → 6 1 2 **3** **4** 5 → 1 2 3 4 5 **6**

It can be shown that two or fewer steps are insufficient to sort the books.

Sample Input #2	Sample Output #2
9 9 2 4 3 7 5 1 8 6	5



This page is intentionally left blank.