



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, \dots, 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

```
6
6 2 1 4 3 5
```

Sample Output #1

```
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 \rightarrow 6 **1** 2 4 3 5 \rightarrow 6 1 2 **3** 4 5 \rightarrow 1 2 3 4 5 **6**

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

Sample Input #2

```
9
9 2 4 3 7 5 1 8 6
```

Sample Output #2

```
5
```