Sorting a permutation P77983_en

Given a permutation of $\{1, \ldots, n\}$, you must sort it in increasing order. The only operation allowed is to reverse the first i elements of the current permutation, for any $2 \leq i \leq n$.

For instance, in one step we can transform [3, 5, 2, 4, 1] into [5, 3, 2, 4, 1], [2, 5, 3, 4, 1], [4, 2, 5, 3, 1] and [1, 4, 2, 5, 3].

Given a permutation, what is the minimum number of steps to sort it?

Input

Input consists of several permutations, each with an n between 1 and 18, followed by n different numbers between 1 and n.

Output

For every permutation, print the minimum number of operations to sort it.

Sample input 1

```
3  1 2 3
2  2 1
1  1
4  2 1 4 3
6  1 3 2 6 5 4
8  4 1 7 8 3 6 5 2
18  11 17 3 10 14 1 18 5 9 6 13 15 4 8 2 12 16 7
```

Sample output 1

```
0
1
0
3
5
7
19
```

Problem information

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