Sorting a permutation P62723_en

Consider a permutation of the numbers of 1 to n, for a certain given n. At every step, you can choose one i between 1 and n, and to turn the elements of the first i positions of the permutation. The aim is to leave the permutation sorted (in increasing or decreasing order).

Write a program that computes the minimal number of necessary steps to sort a given permutation.

Input

Input consists of a natural $n > 0$, followed by a permutation of the numbers from 1 to n.

Output

Your program must print the minimal number of necesary steps to sort the permutation, following the format of the instances.

Sample input 1

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

Sample output 1

```
0 steps are needed
```

Sample input 2

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

Sample output 2

```
1 steps are needed
```

Sample input 3

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

Sample output 3

```
6 steps are needed
```

Problem information

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Generation: 2026-01-25T11:14:50.880Z