Problem G. Petr's Algorithm

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

Petr is well-known for his unusual contests which shuffle well-established standings a lot. Each of his contests has a positive integer parameter k: its *unusualness*.

To predict results of such a contest with n participants, we can use the following *algorithm*: take an identity permutation of length n: $p_1 = 1$, $p_2 = 2$, ..., $p_n = n$ and then sequentially shuffle all segments of length k from left to right.

In other words, we perform $(n - k + 1)$ operations, where on the i-th operation we permute elements p_i, p_{i+1}, ..., p_{i+k-1} in random order so that all the permutations of these elements are equiprobable.

Given the resulting permutation p, can you recover the *unusualness* parameter k of this particular Petr's contest? To make things easier, we will only give you such tests that $20k \le n$ holds.

Input

The first line contains a single integer n ($40 \le n \le 10^5$) — the length of the permutation.

The second line contains n distinct integers p_1, p_2, ..., p_n ($1 \le p_i \le n$) — the resulting permutation. It is guaranteed that this permutation was generated using the algorithm described above for some k such that $20k \le n$.

Output

Print a single integer — the *unusualness* parameter k of this particular Petr's contest.

Example

standard input	standard output
40 2 3 4 1 6 5 8 9 7 11 10 12 14 13 15 17 18 16 19 20 21 23 22 25 26 24 28 27 30 29 32 33 31 35 36 37 38 34 40 39	2

Note

The line breaks in the example are added for clarity and do not exist in real tests.