Statement problem Bonus

Since it would have been too easy to receive only 7 tasks in this contest, the scientific committee decided to give you a gift: a permutation! However, because we live in such controversial days, its requested, at least from a moral point of view, to share it. Modified. As little times as possible. Such that some properties are respected.

A permutation of length N is given. Make as few swaps of adjacent elements of the permutation such that, for the final permutation, $P_i - P_{i-1} = 1$ for at least $N - 2$ indexes $\forall\ i \in [2,\ N]$.

Input

The input will be read from *stdin*, which contains on the first line the number T of tests. Every test contains on the first line the size of the permutation N and on the second line, N different numbers between 1 and N.

Output

The output will be written to *stdout*, and it will contain T lines, where the i^{th} line contains the answer to the i^{th} test.

Restrictions

- $1 \leq T \leq 5$
- $1 \leq N \leq 50000$
- For 10 points: $N \leq 7$
- For another 20 points: $N \leq 50$
- For another 10 points the identity permutation $e = (1,\ 2,\ \ldots,\ N)$ is valid.
- For another 10 points the answer is less than or equal to 2.

Example

stdin	stdout
5 4 1 2 3 4 4 4 1 2 3 4 2 3 4 1 5 3 2 1 5 4 6 1 2 4 3 5 6	0 0 0 4 1

Explanation

There are 5 tests. In the first 3 tests, the permutations already respect the requested properties.
The 4^{th} permutation can be transformed with 4 swaps into the permutations 2, 3, 4, 5, 1 or 1, 2, 3, 4, 5, both of them being valid.
In the 5^{th} permutation can be transformed into the permutation 1, 2, 3, 4, 5, 6 by swapping 3 and 4.