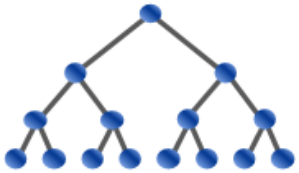

USACO 2026 Third Contest, Gold
Problem 1. Good Cyclic Shifts

Time Remaining: **3 hrs, 59 min, 17 sec**

Not submitted yet

English (en)

For a permutation $p_1, p_2, \ldots, p_N$ of $1 \ldots N$ $(1 \le N \le 2 \cdot 10^5)$, let $f(p) = \sum_{i=1}^{N} \frac{|p_i - i|}{2}$. A permutation is *good* if it can be turned into the identity permutation using at most $f(p)$ swaps of adjacent elements.

Given a permutation, find which cyclic shifts of it are good.

INPUT FORMAT (input arrives from the terminal / stdin):

The input consists of T $(1 \le T \le 10^5)$ independent tests. Each test is specified as follows:

The first line contains N.

The second line contains $p_1, p_2, \ldots, p_N$ $(1 \le p_i \le N)$, which is guaranteed to be a permutation of $1 \ldots N$.

It is guaranteed that the sum of N over all tests does not exceed 10^6.

OUTPUT FORMAT (print output to the terminal / stdout):

For each test, output two lines:

On the first line, output the number of good cyclic shifts k.

Then output a line with k space-separated integers s $(0 \le s < N)$ in increasing order, meaning that p is good when cyclically shifted to the right s times.

SAMPLE INPUT:

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

SAMPLE OUTPUT:

```
0

2
0 1
5
0 1 2 3 4
```

Consider the second test case, where $p = [1, 2, 4, 3]$.

- $f(p) = (|1-1| + |2-2| + |4-3| + |3-4|)/2 = 1$. Since p can be turned into the identity permutation in one move by swapping p_3 and p_4, p is good.
- Cyclically shifting p to the right 1 time, we get $q = [3, 1, 2, 4]$. $f(q) = (|3-1| + |1-2| + |2-3| + |4-4|)/2 = 2$. Since q can be turned into the identity permutation in two moves by swapping q_1 two steps forward, q is good.

It can be seen that the other two cyclic shifts are not good.

SCORING:

- Input 2: $N \le 10$
- Inputs 3-5: $T \le 10, N \le 2000$
- Inputs 6-11: No additional constraints.

Problem credits: Akshaj Arora

Language: C

Source File: 选取文件 未选择文件

Submit Solution