2012 SLIPSTREAM

The world of pigeon racing may be cutthroat down on the ground but up in the air the birds acquit themselves in a far more chivalrous manner. (Despite all attempts at selective breeding to remove good breeding.) When engaged in endurance races birds, for the most part, fly in formation in a straight line so as to take advantage of the slipstreams. When a bird does change position it moves along the line whilst all the other birds stay in their relative positions until the manoeuvre is completed.

In some competitions birds will happily move themselves up (towards the front) or down the line. In competitions where birds cannot face the shame of moving themselves down the line, when a bird moves it will only move up the line.

For example, suppose the pigeons were in the order 42315, with 5 at the front of the line. Bird 1 could change position (moving down the line) so that the new order was 14235, followed by bird 4 moving (up the line) so they were in the order 12345. Since the birds cannot go directly from 42315 to 12345, the sequence 42315 → 14235 → 12345 shows the minimum number of changes required to go between these orderings. If this had been a competition where birds would only move up the line (so the initial move by bird 1 would not have taken place) a valid minimal sequence would be 42315 → 42135 → 41235 → 12345; i.e. 3 moving, then 2 and finally 4.

SAMPLE INPUT

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

Write a program that finds the minimum number of position changes required to re-order the pigeons for both types of competition. The first line of the input will be a single integer p ($1 \le p \le 50{,}000$) indicating the number of pigeons. The next p lines will consist of a single integer p_i ($1 \le p_i \le 50{,}000$), the i^{th} of these indicating the pigeon initially in position i. No pigeon will appear in more than one position. Moving up the line is equivalent to increasing position; i.e. away from position 1.

You should output two integers, the minimum number of position changes to put the pigeons in increasing order *1* to *n*, first for a competition where changes in either direction are permitted and then for a competition where changes are only allowed up the line.

SAMPLE OUTPUT

```
2 3
```

The answers for the two types of competition will be evaluated separately.