

Up and Down

Problem

You are given a sequence of distinct integers $A = [A_1, A_2, \dots, A_N]$, and would like to rearrange it into an *up and down* sequence (one where $A_1 < A_2 < \dots < A_m > A_{m+1} > \dots > A_N$ for some index m , with m between 1 and N inclusive).

The rearrangement is accomplished by swapping two *adjacent* elements of the sequence at a time. Predictably, you are particularly interested in the minimum number of such swaps needed to reach an *up and down* sequence.

Input

The first line of the input gives the number of test cases, T . T test cases follow. Each test case begins with a line containing a single integer: N . The next line contains N *distinct* integers: A_1, \dots, A_N .

Output

For each test case, output one line containing "Case #x: y", where x is the test case number (starting from 1) and y is the minimum number of swaps required to rearrange A into an *up and down* sequence.

Limits

Memory limit: 1 GB.

$1 \leq T \leq 100$.

$1 \leq A_i \leq 10^9$

The A_i will be pairwise distinct.

Small dataset

Time limit: 60 seconds.

$1 \leq N \leq 10$.

Large dataset

Time limit: 120 seconds.

$1 \leq N \leq 1000$.

Sample

Sample Input

```
2
3
1 2 3
```

Sample Output

```
Case #1: 0
Case #2: 1
```

5
1 8 10 3 7

In the first case, the sequence is already in the desired form (with $m=N=3$) so no swaps are required.

In the second case, swapping 3 and 7 produces an *up and down* sequence (with $m=3$).