Sequence Operation

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Little Cyan Fish has a non-negative integer sequence $a_1, a_2, \ldots, a_n$ of length n in his hand. Little Cyan Fish can perform the following operation any number of times:

- Choose an integer $1 \leq i \leq n$.
- Change a_i to $\operatorname{mex}_{1 \leq k < i} a_k$.

Here, for a set of non-negative integers S, the notation $\operatorname{mex} S$ is defined as the smallest non-negative integer that does not appear in the set S. For example, $\operatorname{mex}\{0, 1, 2, 4, 6\} = 3$, $\operatorname{mex}\{1, 2, 3\} = 0$, $\operatorname{mex} \varnothing = 0$.

Little Cyan Fish wants to make the value of a_n as large as possible through some number of operations (possibly 0). Little Cyan Fish wants you to calculate:

1. What is the maximum possible value of a_n after any number of operations;
2. On the basis of satisfying 1, what is the minimum number of operations required to achieve this maximum value.

Input

There are multiple test cases. The first line of the input contains a single integer T ($1 \leq T$), indicating the number of test cases.

For each test case, the first line of the input contains an integer n ($1 \leq n \leq 10^6$), representing the length of the sequence.

The next line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \leq a_i \leq 10^9$).

It is guaranteed that the sum of n over all test cases does not exceed 10^6.

Output

For each test case, output a single line with two integers. The first integer represents the maximum value of a_n, and the second integer represents the minimum number of operations required.

Example

standard input	standard output
4 2 0 114514 3 0 1 0 4 3 1 2 0 6 6 5 4 3 2 1	114514 0 2 1 3 2 5 3