Longest Increasing Subsequence

Time Limit: 2 seconds

Problem Description

Given an integral sequence $a_1, \ldots, a_n$. A sequence $a_{i_1}, \ldots, a_{i_k}$ is a subsequence of $a_1, \ldots, a_n$ if $1 \leq i_1 < \cdots < i_k \leq n$. Find the longest subsequence $a_{i_1}, \ldots, a_{i_k}$ such that $a_{i_1} < \cdots < a_{i_k}$.

Technical Specifications

1. The number of test cases is no more than 20.

2. $n \leq 20000$.

3. $0 < a_i \leq 1000000$ for every $i \in \{1, \ldots, n\}$,

Input Format

The first line of the input file contains an integer indicating the number of test cases. The first line of each test case contains an integer n which denotes the length of the sequence. The second line contains the n-integer sequence $a_1, \ldots, a_n$ separated by blanks.

Output Format

For each test case, output the length k of the longest increasing subsequence $a_{i_1}, \ldots, a_{i_k}$ of $a_1, \ldots, a_n$.

Sample Input

```
3
1
1
11
10 8 6 3 1 9 15 13 11 19 17
11
11 1 2 3 10 9 8 7 4 6 5
```

Sample Output

```
1
4
5
```