



## Task A

### Longest Increasing Subsequence

Write a program which for a given sequence of  $n$  pairwise distinct integers computes, for every  $0 \leq i \leq n-1$ , the size of the largest increasing subsequence with the last element equal to the  $i$ -th element of the sequence. Your algorithm should work in  $O(n^2)$ -time.

#### Input

The first line contains an integer  $z$  ( $1 \leq z \leq 2 \cdot 10^9$ ) – the number of data sets. An exemplary data set is as follows:

The first line contains number  $n$  denoting the size of the sequence ( $1 \leq n \leq 4000000$ ). The next line contains  $n$  integers of the sequence, separated by a space.

#### Output

A sequence of  $n$  integers, where the  $i$ -th integer denotes the size of the longest subsequence ending at the  $i$ -th item.

**Dostępna pamięć: 64MB**

#### Example

For the input:

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

the output is:

```
1 2 2 3 4
```