Task A
Longest Increasing Subsequence

Write a program which for a given sequence of n pairwise distinct integers computes, for every $0 \leqslant i \leqslant n-1$, 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 ($1 \leqslant z \leqslant 2 \cdot 10^9$) – the number of data sets. An exemplary data set is as follows:

The first line contains number n denoting the size of the sequence ($1 \leqslant n \leqslant 4000000$). 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
```