Cyclic Shift

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

You are given a sequence of integers of length n: $a_1, a_2, \ldots, a_n$.

Consider all n possible cyclic shifts (rotations) of this sequence. For a starting position p ($1 \le p \le n$), the corresponding cyclic shift is the sequence

$$b_1, b_2, \ldots, b_n = a_p, a_{p+1}, \ldots, a_n, a_1, a_2, \ldots, a_{p-1}.$$

For this shifted sequence, define its **prefix maximum sequence** $c_1, c_2, \ldots, c_n$ by

$$c_i = max(b_1, b_2, \ldots, b_i) \forall i = 1, 2, \ldots, n.$$

We compare two sequences of the same length using the usual lexicographical order: c is lexicographically smaller than d if and only if there exists an index i such that $c_1 = d_1, c_2 = d_2, \ldots, c_{i-1} = d_{i-1}$ and $c_i < d_i$.

Your task is to choose a cyclic shift of the original sequence such that its prefix maximum sequence is lexicographically smallest among all n possible cyclic shifts.

Input

The first line contains a single integer T ($1 \le T \le 2 \cdot 10^5$), the number of test cases.

Each test case consists of two lines:

- The first line contains a single integer n ($1 \le n \le 5 \cdot 10^5$).
- The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le n$).

It is guaranteed that the sum of n over all test cases does not exceed $5 \cdot 10^5$.

Output

For each test case, output one line containing n integers: the lexicographically smallest prefix maximum sequence after cyclic shift.

Example

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