Cute and Curious Baby

Description

CC has a cute and curious baby, DD.

Today, CC plays a fun puzzle game, Sequence Reverse, with DD.

At the begin of Sequence Reverse, you will get an initial sequence.

At each `round` of Sequence Reverse, DD need to do the following step:

- Suppose the current sequence S is $S_1, S_2, ..., S_n$. DD need to find a cutting point in the sequence S. Here we assume that he chose the cutting point $i (1 \leq i < n)$.
- Cut the current string into two non-empty parts, $S_1, S_2, ..., S_i$ and $S_{i+1}, S_{i+2}, ..., S_n$.
- Reverse each part.
  - $S_1, S_2, ..., S_i \rightarrow S_i, ..., S_2, S_1$
  - $S_{i+1}, S_{i+2}, ..., S_n \rightarrow S_n, ..., S_{i+2}, S_{i+1}$
- Merge the two reversed parts as a new sequence T. Thus, we have $T = S_i, S_{i-1}, ..., S_2, S_1, S_n, S_{n-1}, ..., S_{i+2}, S_{i+1}$
- The selected i must minimize the dictionary order of T.
- Change the current sequence as T.

In this game, DD needs to repeat the above steps for many rounds until the current sequence has appeared before.

However, DD just stood there paralyzed, so CC is worried that DD does not understand the rules of Sequence Reverse. Hence, CC decided to ask you to demonstrate `a single round` for DD, what the sequence will look like after you simulate `a single round`.

Please note: if the length of the sequence is 1, you don't have to do anything.

Input

The first line of the input contains an integer T denotes the number of test cases in this input.

Each test case contains two lines. The first line contains an integer N denotes the length of the initial sequence. The second line contains N integers $a_1, a_2, ..., a_N$, and a is the initial sequence.

- $1 \leq T \leq 5 \times 10^5$
- $1 \leq N \leq 5 \times 10^5$
- $\sum N \leq 5 \times 10^5$
- $1 \leq a_i \leq 10^9$

Output

For each test case, you need to output the sequence after you simulate `a single round` in a line.

Sample Input

```
7
3
1 2 3
3
1 3 2
3
2 1 3
3
2 3 1
3
3 1 2
3
3 2 1
3
2 2 1
```

Sample Output

```
1 3 2
1 2 3
1 2 3
2 1 3
1 3 2
2 3 1
2 1 2
```