

D. Quartet Swapping

time limit per test: 2 seconds

memory limit per test: 256 megabytes

You are given a permutation a of length n^* . You are allowed to do the following operation any number of times (possibly zero):

- Choose an index $1 \leq i \leq n - 3$. Then, swap a_i with a_{i+2} , and a_{i+1} with a_{i+3} simultaneously. In other words, permutation a will be transformed from $[\dots, a_i, a_{i+1}, a_{i+2}, a_{i+3}, \dots]$ to $[\dots, a_{i+2}, a_{i+3}, a_i, a_{i+1}, \dots]$.

Determine the lexicographically smallest permutation[†] that can be obtained by applying the above operation any number of times.

* A permutation of length n is an array consisting of n distinct integers from 1 to n in arbitrary order. For example, $[2, 3, 1, 5, 4]$ is a permutation, but $[1, 2, 2]$ is not a permutation (2 appears twice in the array), and $[1, 3, 4]$ is also not a permutation ($n = 3$ but there is 4 in the array).

† An array x is lexicographically smaller than an array y of the same size if and only if the following holds:

- in the first position where x and y differ, the array x has a smaller element than the corresponding element in y .

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 1000$). The description of the test cases follows.

The first line of each test case contains a single integer n ($4 \leq n \leq 2 \cdot 10^5$) — the length of permutation a .

The second line contains n integers a_1, a_2, \dots, a_n ($1 \leq a_i \leq n$) — the elements of permutation a .

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, output the lexicographically smallest permutation that can be obtained by applying the above operation any number of times.

Example

input	Copy
3	
4	
3 4 1 2	
5	
5 4 3 1 2	
10	
10 9 8 7 6 5 4 3 2 1	
output	Copy
1 2 3 4	
2 1 3 4 5	
2 1 4 3 6 5 8 7 10 9	

Note

In the first test case, an operation can be done on index $i = 1$, and the permutation will become $[1, 2, 3, 4]$, which is the lexicographically smallest permutation achievable.

In the second test case, we can do the following sequence of operations:

- Do an operation on index $i = 2$. The permutation becomes $[5, 1, 2, 4, 3]$.
- Do an operation on index $i = 1$. The permutation becomes $[2, 4, 5, 1, 3]$.
- Do an operation on index $i = 2$. The permutation becomes $[2, 1, 3, 4, 5]$.

Codeforces Round 1024 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language:
GNU G++23 14.2 (64 bit, ms)

Choose file:

Choose File

No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
321882978	May/29/2025 10:42	Accepted
319255531	May/11/2025 18:39	Wrong answer on pretest 2
319254124	May/11/2025 18:36	Wrong answer on pretest 2

→ Problem tags

data structures



greedy

sortings

*1800

No tag edit access

→ Contest materials

- Announcement (en) 
- Tutorial (en) 

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