

## G. XOUR

time limit per test: 2 seconds  
memory limit per test: 256 megabytes

You are given an array  $a$  consisting of  $n$  nonnegative integers.

You can swap the elements at positions  $i$  and  $j$  if  $a_i \text{ XOR } a_j < 4$ , where XOR is the bitwise XOR operation.

Find the lexicographically smallest array that can be made with any number of swaps.

An array  $x$  is lexicographically smaller than an array  $y$  if in the first position where  $x$  and  $y$  differ,  $x_i < y_i$ .

### Input

The first line contains a single integer  $t$  ( $1 \leq t \leq 10^4$ ) — the number of test cases.

The first line of each test case contains a single integer  $n$  ( $1 \leq n \leq 2 \cdot 10^5$ ) — the length of the array.

The second line of each test case contains  $n$  integers  $a_i$  ( $0 \leq a_i \leq 10^9$ ) — the elements of the array.

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  $n$  integers — the lexicographically smallest array that can be made with any number of swaps.

### Example

input	Copy
4 4 1 0 3 2 5 2 7 1 5 6 8 1 2 1 2 1 2 1 2 4 16 4 1 64	
output	Copy
0 1 2 3 1 5 2 6 7 1 1 1 1 2 2 2 2 16 4 1 64	

### Note

For the first test case, you can swap any two elements, so we can produce the sorted array.

For the second test case, you can swap 2 and 1 (their XOR is 3), 7 and 5 (their XOR is 2), and 7 and 6 (their XOR is 1) to get the lexicographically smallest array.

Codeforces Round 944 (Div. 4)

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++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
<a href="#">282610168</a>	Sep/23/2024 14:09	Accepted

→ Problem tags

data structures dsu sortings \*1700

No tag edit access

→ Contest materials

Announcement (en)

Tutorial (en)

