Problem

You are required to collect N numbers from a bag. Initially, the bag is empty. Whenever you put a number X in the bag, then the owner of the bag asks the question.

The questions are as follows:

- What is the greatest integer that is smaller than X and present inside the bag?
- What is the smallest number that is greater than X and present inside the bag?

If you answer both the questions correctly, then you can put X inside the bag. Your task is to answers the questions that are asked by the owner of the bag.

Input format

- First line: N denoting the number of integers that you want to put inside the bag
- Next N lines: X denoting the integer that you want to put inside the bag

Output format

For every integer X, print the answers of the questions, in the form of space-separated integers, that are asked by the owner of the bag. If no such numbers exist in the bag, then print -1.

Constraints

$1 \leq N \leq 10^5$
$1 \leq X \leq 10^9$
All Xs are distinct.

Sample Input	Sample Output
5 1 4 2 3 7	-1 -1 1 -1 1 4 2 4 4 -1

Time Limit: 1

Memory Limit: 256

Source Limit: