

Problem E. Egma Game

Input file: `stdin`
Output file: `stdout`
Time limit: 2 seconds
Memory limit: 256 MB

As we all know, **TiChuot97** is *one of* the greatest professional gamers of all time. And, similar to other great gamers, he loves games, especially nim games. Today, he just found out an online nim game - Egma. As other nim games, Egma requires proficiency in computing mex values in order to master it. **TiChuot97** understands that, just like millions of other games he mastered, Egma requires practicing. This is where his best friend, **tourist**, comes in to help.

tourist has prepared a drill for **TiChuot97**'s practice. Initially, **TiChuot97** is given an array of size n of nonnegative integers a_1, a_2, \dots, a_n . Then, **tourist** will give **TiChuot97** q queries each consists of two numbers l, r ($1 \leq l \leq r \leq n$) asking for the mex of $\{a_l, a_{l+1}, \dots, a_r\}$. Of course, **TiChuot97** finished this drill easily. However, he thinks that this challenge can improve, not only his mex-computing skill, but also his programming skill. Do you also want to give this challenge a try?

Note: Mex value of a set of nonnegative integers is defined to be the minimum nonnegative integer that does not belong to the set.

Input

The first line contains an integer n ($1 \leq n \leq 5 \times 10^5$), the length of the initial array. The second line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i \leq 10^9$). The third line contains an integers q ($1 \leq q \leq 5 \times 10^5$), the number of queries. Each of the next q lines contain a pair l, r ($1 \leq l \leq r \leq n$) describing a query.

Output

For each query, output on one line the answer to such query.

Examples

stdin	stdout
5	0
1 2 3 0 5	4
2	
1 3	
1 4	