COCI '15 Contest 7 #6 Prokletnik

Time limit: 4.0s **Memory limit:** 128M

Young Luka is about to enter a house with the evil witch Marica inside. As soon as he enters the house, she asks him questions about her array of N numbers. Luka fearfully asks for a clarification of the questions. Marica explains to him that each query consists of two integers L and R which represent the positions of a contiguous sub-array in her array.

It is Luka's task to answer for each query what the longest **contiguous** sub-array of that contiguous sub-array (it can be the entire sub-array) having the property of being magical. An array is called magical if all the values are between the values of the first and last number in that array. For example, $[1\,3\,1\,2\,4]$ is magical, the same as $[4\,1\,1\,2\,1]$, whereas $[3\,3\,4\,1]$ is not magical.

Input

The first line of input contains the integer N $(1 \leq N \leq 500\,000)$, the number of numbers in the array.

The second line contains N integers a_i $(1 \leq a_i \leq 10^9)$.

The third line contains the integer Q $(1 \leq Q \leq 500\,000)$, the number of queries.

Each of the following Q lines contains two integers, L and R $(1 \leq L \leq R \leq N)$, representing the sub-array from the query.

Output

The i^{th} line of output must contain a single integer – the answer to the i^{th} query.

Scoring

In test cases worth 50% of total points, it will hold $N, Q \leq 30\,000$.

Sample Input 1

```
5
5 4 3 3 2
3
1 2
1 1
2 4
```

Sample Output 1

```
2
1
3
```

Sample Input 2

```
6
6 6 5 1 6 2
3
4 5
4 6
1 4
```

Sample Output 2

```
2
2
4
```