Range Minimum Query

Range Minimum Query (RMQ) is a set of problems which deals with finding a property (here minimum) of a range. Segment Tree can be very helpful when solving with such problems. A segment tree is a tree like data structure which is used to store the information about intervals. Here's the [(wiki link)] of it.

You are given a array of *N* integers, *arr[0], arr[1], .., arr[(N-1)]*. And you are given a list of ranges. For each range, *(l, r)* you have to find the minimum value between range *arr[l], arr[l+1], arr[l+2], .., arr[r]*.

Input

First line will contain two integers, *N M*, length of array and number of queries. Then in next line, there are N space separated integers which represent the array, *arr[0], arr[1], .., arr[N-1]*. Then *M* line follows. Each *M* line will contain two integers, *l r*, representing a range.

Output

For each range, *(l, r)*, you have to print the minimum integer in subarray *arr[l], arr[l+1], .., arr[r]* in separate line.

Constraints

$1 <= N, M <= 10^5$
$-10^5 <= arr[i] <= 10^5$, where $0 <= i < N$
$0 <= l <= r < N$

Sample Input

```
10 5
10 20 30 40 11 22 33 44 15 5
0 5
1 2
8 9
0 9
4 6
```

Sample Output

```
10
20
5
5
11
```

Explanation

- For range (0, 5), subarray will be [10, 20, 30, 40, 11, 22]. So minimum value will be 10.
- For range (1, 2), subarray will be [20, 30]. Minimum value = 20.
- For range (8, 9), subarray is [15, 5]. Minimum value = 5.
- For range (0, 9), Here we have to find the minimum (5) of the whole array.

- For range (3, 5), subarray is [40, 11, 22]. Minimum value = 11.