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Input file:	*standard input*
Output file:	*standard output*
Time limit:	4 seconds
Memory limit:	512 mebibytes

You are given a sequence consisting of n integers $a_1, a_2, \ldots, a_n$. Let's call some contiguous segment of this sequence $a_l, a_{l+1}, \ldots, a_{r-1}, a_r$ a *canyon* if $a_l = a_r$ and for each integer $l \le x \le r$, the inequality $a_x \le a_l$ holds. In particular, $l = r$ automatically means that the segment is a canyon. The length of a canyon is considered to be equal to $r - l$.

Your task is to answer m queries of the following form: for a given contiguous segment $a_l, a_{l+1}, \ldots, a_{r-1}, a_r$ defined by its endpoints l and r, find a canyon of maximum length that is a subsegment of this segment.

Input

The first line of input contains two integers n and m ($1 \le n, m \le 5 \cdot 10^5$), the length of the sequence and the number of queries.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($-10^9 \le a_i \le 10^9$).

Each of the following m lines contains two positive integers l_i and r_i which describe the queries ($1 \le l_i \le r_i \le n$).

Output

For each of the m queries, print the maximum length of a canyon inside the given segment on a separate line.

Example

standard input	standard output
8 5 4 3 2 2 3 3 7 3 1 7 6 8 1 3 3 6 1 8	4 0 0 1 4

Note

In the sample test, the possible maximal canyons for each of the queries are: $(2, 6)$, $(6, 8)$, $(1, 1)$, $(3, 4)$ and $(2, 6)$.