Card Game

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	1024 mebibytes

Randias is playing a card game. In this game, each card has a number written on it. For cards with numbers $a_1, a_2, \ldots, a_m$, Randias will play the game in the following way.

Initially, all cards are in his hand. Randias will maintain a card sequence (initially empty). In the i-th operation, Randias will put the i-th card (this card has number a_i written on it) at the end of the card sequence. Then:

- If there are no other cards in the sequence with number a_i written on them, the i-th operation ends.
- Otherwise, let the j-th card in the card sequence have number a_i written on it. Randias will take away all cards between the j-th card and the newly placed card, including the j-th card and the newly placed card.

For example, let $a = [2, 1, 3, 1, 2, 3]$, and the card sequence $s = []$ initially.

After the 1-st operation, $s = [2]$.

After the 2-nd operation, $s = [2, 1]$.

After the 3-rd operation, $s = [2, 1, 3]$.

After the 4-th operation, $s = [2]$ (cards $1, 3, 1$ are taken away).

After the 5-th operation, $s = []$ (cards $2, 2$ are taken away).

After the 6-th operation, $s = [3]$.

Now, Randias is given n cards $a_1, a_2, \ldots, a_n$. He has q queries. The i-th query is a pair of integers ℓ_i, r_i. With this query, Randias wants to know how many cards will be left in the card sequence if the initial list of cards is $a_{\ell_i}, a_{\ell_i+1}, \ldots, a_{r_i}$.

For some reason, Randias hopes you can answer the questions **online**. That is, you need to decode the next question with the answer for the previous question.

Input

The first line contains two integers n and q ($1 \le n, q \le 3 \cdot 10^5$) denoting the number of cards and the number of queries.

The following line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le n$).

Each of the following q lines contains two integers ℓ'_i and r'_i ($0 \le \ell'_i, r'_i \le 2n$). Let the answer for the last query is *lastans*. Then $\ell_i = \ell'_i \oplus \mathit{lastans}$ and $r_i = r'_i \oplus \mathit{lastans}$ are the next query. In these formulas, $\oplus$ is the bitwise exclusive OR operation. It is guaranteed that, after decoding, $1 \le \ell_i \le r_i \le n$. If you haven't answered any queries before, $\mathit{lastans} = 0$.

Output

For each query, output a line with one integer: the answer to that query.

Examples

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

Note

For the first example, the segments in the queries are $[5, 5]$, $[2, 5]$, $[1, 1]$, $[1, 4]$, and $[3, 5]$.