Problem K. Great Party

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

Grammy joined a great party.

There is an interesting game at the party. There are n piles of stones on the table. The i-th pile has a_i stones in it. Two players participate in the game and operate the stones in turn.

In each player's turn, the player will do the following two steps:

1. Select a **non-empty** pile of stones, select a positive amount of stones to remove from it.
2. Keep the remaining stones in the pile still **or** merge them all into another **non-empty** pile of stones.

Those who cannot operate lose the game.

Now, Grammy has q questions. For each question, she asks you how many sub-segments of $[l, r]$ satisfy that if the piles in the segment are taken out alone for the game, the first player will win.

Input

The first line contains two integers n and q ($1 \le n, q \le 10^5$).

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le 10^6$).

The i-th of the next q lines contains two integers l_i and r_i ($1 \le l_i \le r_i \le n$).

Output

The output contains q lines. Each line contains a single integer, denoting the answer to the question.

Examples

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