A. Eugeny and Array

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Eugeny has array $a = a_1, a_2, ..., a_n$, consisting of n integers. Each integer a_i equals to -1, or to 1. Also, he has m queries:

- Query number i is given as a pair of integers l_i, r_i $(1 \le l_i \le r_i \le n)$.
- The response to the query will be integer 1, if the elements of array a can be rearranged so as the sum $a_{l_i} + a_{l_i+1} + ... + a_{r_i} = 0$, otherwise the response to the query will be integer 0.

Help Eugeny, answer all his queries.

Input

The first line contains integers n and m $(1 \le n, m \le 2 \cdot 10^5)$. The second line contains n integers $a_1, a_2, ..., a_n$ $(a_i =$ -1, $1)$. Next m lines contain Eugene's queries. The i-th line contains integers l_i, r_i $(1 \le l_i \le r_i \le n)$.

Output

Print m integers — the responses to Eugene's queries in the order they occur in the input.

Examples

input
2 3 1 -1 1 1 1 2 2 2

output
0 1 0

input
5 5 -1 1 1 1 -1 1 1 2 3 3 5 2 5 1 5

output
0 1 0 1 0