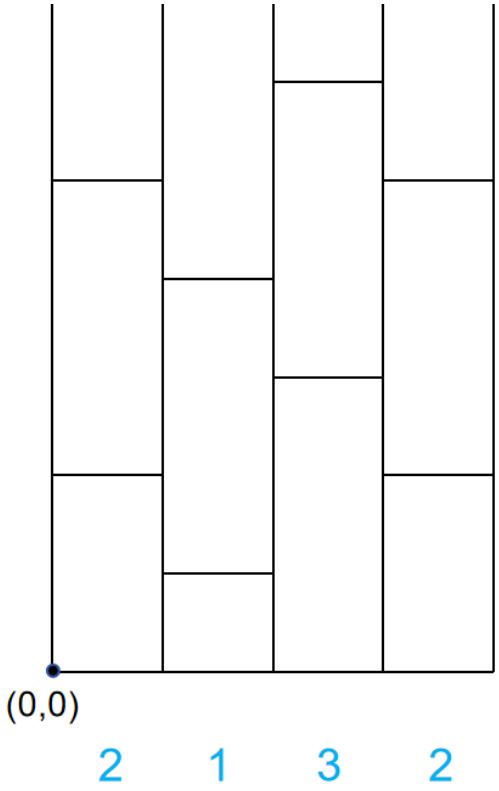
The Unending Dream

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	1024 megabytes

Beacon had a dream, in which he was playing carefreely on a wooden bridge.

The bridge consists of n columns of wooden planks. Each column has infinitely many planks, and for the i-th column, the length of the first plank is a_i, and the length of all subsequent planks is k. **The length of the first plank is not greater than** k. The coordinate of the bottom-left corner of the bridge surface is $(0, 0)$, and the bridge surface covers the range $\{0 \le x \le n, y \ge 0\}$. The figure below shows an example with $n = 4$, $a = [2, 1, 3, 2]$, $k = 3$:



Beacon finds the gaps on the bridge amusing. He now wants to ask q questions. For each query, given that he walks from cell (x_1, y_1) to cell (x_2, y_2), what is the minimum number of times he must cross a gap between planks? (Each time he steps from one plank onto another, he crosses a gap between planks.)

More precisely, his starting point is the coordinate $(x_1 - 0.5, y_1 - 0.5)$, and his destination is the coordinate $(x_2 - 0.5, y_2 - 0.5)$. His movement is as follows: when he is at coordinate (x, y), he may move 1 unit length in any of the four directions — up, down, left, or right — to one of the four coordinates $(x-1, y)$, $(x+1, y)$, $(x, y-1)$, and $(x, y+1)$, and he must never leave the bridge surface.

Since he is too lazy, these questions are left for you to answer.

Input

The first line contains three integers n, k, q ($1 \le n, q \le 2 \times 10^5$, $1 \le k \le 10^{12}$).

The second line contains n integers a_i ($1 \le a_i \le k$).

The next q lines each contain four integers x_1, y_1, x_2, y_2 ($1 \le y_1, y_2 \le 10^{12}$, $1 \le x_1, x_2 \le n$).

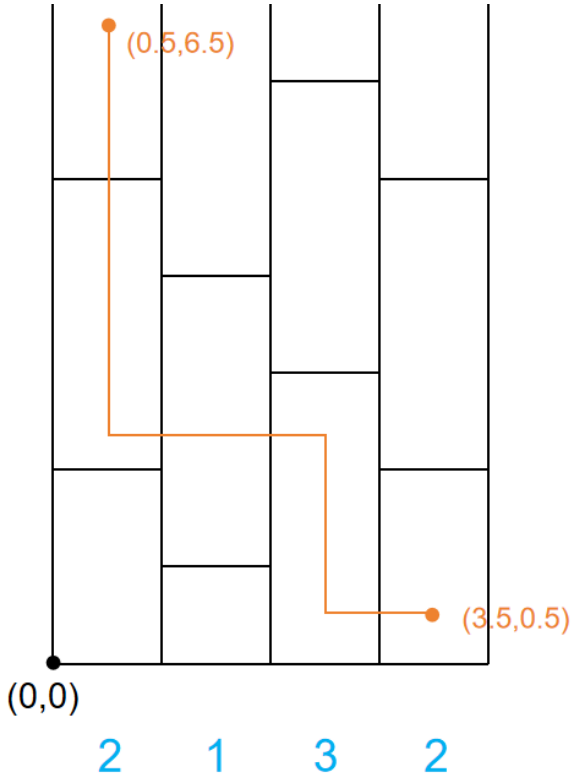
Output

q lines, each containing the answer to the corresponding query.

Example

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

Note



The image above demonstrates a possible path corresponding to the third query, crossing the gaps for 4 times.