E. Listening to Music

time limit per test: 7 seconds
memory limit per test: 64 megabytes
input: standard input
output: standard output

Please note that the memory limit differs from the standard.

You really love to listen to music. During the each of next s days you will listen to exactly m songs from the playlist that consists of exactly n songs. Let's number the songs from the playlist with numbers from 1 to n, inclusive. The quality of song number i is a_i.

On the i-th day you choose some integer v ($l_i \le v \le r_i$) and listen to songs number $v, v+1, ..., v+m-1$. On the i-th day listening to one song with quality less than q_i increases your displeasure by exactly one.

Determine what minimum displeasure you can get on each of the s next days.

Input

The first line contains two positive integers n, m ($1 \le m \le n \le 2 \cdot 10^5$). The second line contains n positive integers $a_1, a_2, ..., a_n$ ($0 \le a_i < 2^{30}$) — the description of songs from the playlist.

The next line contains a single number s ($1 \le s \le 2 \cdot 10^5$) — the number of days that you consider.

The next s lines contain three integers each l_i, r_i, x_i ($1 \le l_i \le r_i \le n - m + 1; 0 \le x_i < 2^{30}$) — the description of the parameters for the i-th day. In order to calculate value q_i, you need to use formula: , where ans_i is the answer to the problem for day i. Assume that $ans_0 = 0$.

Output

Print exactly s integers $ans_1, ans_2, ..., ans_s$, where ans_i is the minimum displeasure that you can get on day i.

Examples

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

output
2 0 2 3 1