# E. Mahmoud and Ehab and the function

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Dr. Evil is interested in math and functions, so he gave Mahmoud and Ehab array $a$ of length $n$ and array $b$ of length $m$. He introduced a function $f(j)$ which is defined for integers $j$, which satisfy $0 \leq j \leq m - n$. Suppose, $c_i = a_i - b_{i+j}$. Then $f(j) = |c_1 - c_2 + c_3 - c_4 ... c_n|$. More formally, .

Dr. Evil wants Mahmoud and Ehab to calculate the minimum value of this function over all valid $j$. They found it a bit easy, so Dr. Evil made their task harder. He will give them $q$ update queries. During each update they should add an integer $x_i$ to all elements in $a$ in range $[l_i;r_i]$ i.e. they should add $x_i$ to $a_{l_i}, a_{l_i+1}, \ldots, a_{r_i}$ and then they should calculate the minimum value of $f(j)$ for all valid $j$.

Please help Mahmoud and Ehab.

## Input

The first line contains three integers $n$, $m$ and $q$ ($1 \leq n \leq m \leq 10^5$, $1 \leq q \leq 10^5$) — number of elements in $a$, number of elements in $b$ and number of queries, respectively.

The second line contains $n$ integers $a_1, a_2, ..., a_n$. ($-10^9 \leq a_i \leq 10^9$) — elements of $a$.

The third line contains $m$ integers $b_1, b_2, ..., b_m$. ($-10^9 \leq b_i \leq 10^9$) — elements of $b$.

Then $q$ lines follow describing the queries. Each of them contains three integers $l_i\ r_i\ x_i$ ($1 \leq l_i \leq r_i \leq n$, $-10^9 \leq x \leq 10^9$) — range to be updated and added value.

## Output

The first line should contain the minimum value of the function $f$ before any update.

Then output $q$ lines, the $i$-th of them should contain the minimum value of the function $f$ after performing the $i$-th update .

### Example

| input |
| --- |
| 5 6 3<br>1 2 3 4 5<br>1 2 3 4 5 6<br>1 1 10<br>1 1 -9<br>1 5 -1 |
| **output** |
| 0<br>9<br>0<br>0 |

## Note

For the first example before any updates it's optimal to choose $j = 0$,
$f(0) = |(1 - 1) - (2 - 2) + (3 - 3) - (4 - 4) + (5 - 5)| = |0| = 0$.

After the first update $a$ becomes $\{11, 2, 3, 4, 5\}$ and it's optimal to choose $j = 1$,
$f(1) = |(11 - 2) - (2 - 3) + (3 - 4) - (4 - 5) + (5 - 6) = |9| = 9$.

After the second update $a$ becomes $\{2, 2, 3, 4, 5\}$ and it's optimal to choose $j = 1$,
$f(1) = |(2 - 2) - (2 - 3) + (3 - 4) - (4 - 5) + (5 - 6)| = |0| = 0$.

After the third update $a$ becomes $\{1, 1, 2, 3, 4\}$ and it's optimal to choose $j = 0$,
$f(0) = |(1 - 1) - (1 - 2) + (2 - 3) - (3 - 4) + (4 - 5)| = |0| = 0$.