Problem B. New Queries On Segment Deluxe

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

You know those problems where you are given an array of length roughly 10^5 and you have to process roughly 10^5 queries about something on a segment? Yes, this is one of those problems. And it should be persistent, because why not.

Consider $k \times n$ matrix A (with k rows and n columns). For a given matrix we can construct the array B as follows: $B_j = \sum_{i=1}^{k} A_{ij}$.

There will be up to $q + 1$ versions of the matrix. The j-th element in i-th row of t-th version of A is denoted as $A_{ij}^{(t)}$. The j-th element of the array B corresponding to t-th version of A is denoted as $B_j^{(t)}$.

You are given the 0-th version of the matrix A. You have to process q queries of 3 types:

- `1 t p l r x` : add x to $A_{pi}^{(t)}$ for $l \le i \le r$, thus creating a new version of the matrix
- `2 t p l r y` : set $A_{pi}^{(t)}$ to be equal to y for $l \le i \le r$, thus creating a new version of the matrix
- `3 t l r` : print $\min_{i=l}^{r} B_i^{(t)}$

The version of the matrix A created after the i-th query will be called the i-th version. Thus version numbers can be from 0 to q inclusive, but some of the integers from 0 to q may not have the correspondent version.

Input

The first line of input contains 3 integers k, n, q ($1 \le k \le 4$, $1 \le n \le 250\,000$, $1 \le q \le 20\,000$) — the dimensions of the matrix and the number of queries respectively.

The i-th of the next k lines contains n integers $A_{i1}^{(0)}, A_{i2}^{(0)}, \ldots, A_{in}^{(0)}$ ($|A_{ij}^{(0)}| \le 10^8$).

The next q lines describe the queries in the format explained earlier. It is guaranteed that t refers to a valid already existing version of the matrix, $1 \le p \le k$, $1 \le l \le r \le n$, $|x| \le 10^4$, $|y| \le 10^8$.

It is guaranteed that there exists at least one query of type 3.

Output

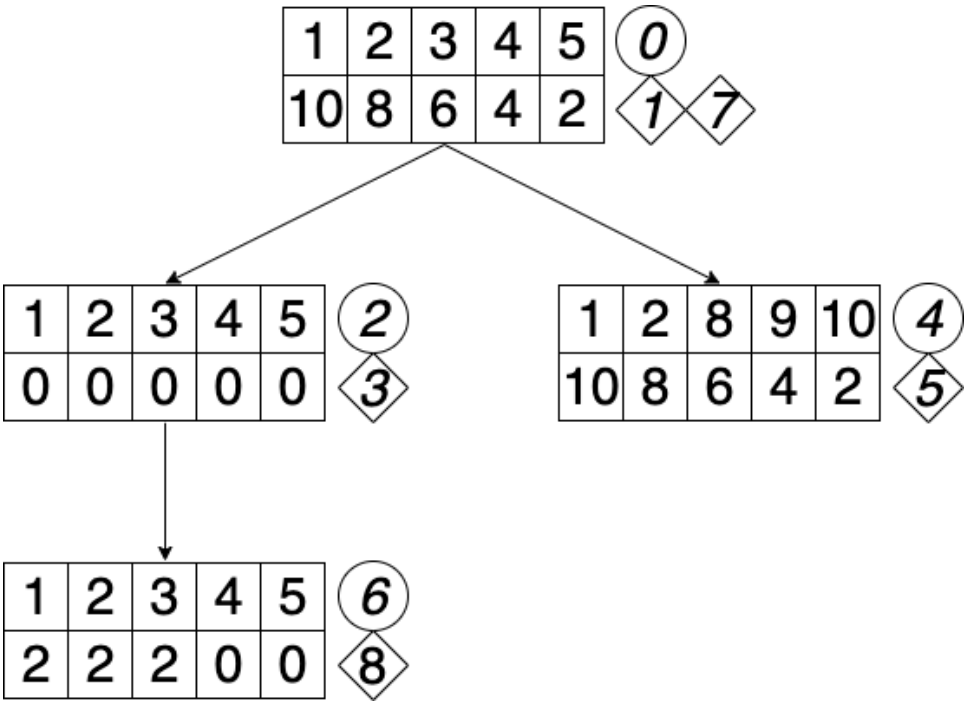
Print the answers to the queries of type 3 in the order in which the queries were given, on separate lines.

Example

standard input	standard output
2 5 8 1 2 3 4 5 10 8 6 4 2 3 0 2 5 2 0 2 1 5 0 3 2 2 5 1 0 1 3 5 5 3 4 2 5 1 2 2 1 3 2 3 0 2 5 3 6 2 5	7 2 10 7 4

Note

Here is how the versions of the matrix will look like:



The number in a circle is the version, the numbers in rhombuses are queries of type 3.