Steaua e numai una

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.8 seconds
Memory limit:	1024 megabytes

Steaua is the only one
We are proud of it all around the world
Steaua is enchanted
Our team has qualified

Sorin the golden child - Steaua is the only one

The current stadium of Steaua (FCSB) is the largest stadium in Romania, hosting the most important matches.

For the next match of FCSB, the organizers have decided to arrange a choreography in Stand 1. The choreography consists of spectators wearing t-shirts with numbers that, when viewed from a distance, will form something relevant to that team.

Stand 1 has M columns, and each column contains N seats. The columns are numbered from 1 to M from left to right, and the seats in a column are numbered from 1 to N from bottom to top.

Thus, the organizing team has to manage Q operations of three types on the stand:

1. **1 X i** – The lowest unoccupied seat in column i is taken by a spectator wearing a t-shirt with number X. It is guaranteed that there is at least one unoccupied seat in column i.
2. **2 idx i** – The spectator sitting on seat with number idx in column i leaves. Since people want a better view of the match, all spectators sitting in seats with higher numbers than idx in the same column move down one seat.
3. **3 st dr L R** – What is the sum of the numbers written on the t-shirts of spectators sitting on seats with numbers in the range $[st, dr]$, in columns within the range $[L, R]$?

Your task is to help the organizers efficiently manage these Q operations.

Input

The first line contains the numbers N ($1 \leq N \leq 10^5$), M ($1 \leq M \leq 5 \times 10^4$), and Q ($1 \leq Q \leq 10^5$).

Each of the following Q lines will describe an operation, as defined in the statement.

For operations of type 1: $0 \leq X \leq 10^6$ and $1 \leq i \leq M$.

For operations of type 2: $1 \leq idx \leq$ the number of people then seated in column i and $1 \leq i \leq M$.

For operations of type 3: $1 \leq st \leq dr \leq N$ and $1 \leq L \leq R \leq M$.

Output

The number of type 3 operations will determine the number of lines in the output.

Each line will represent, in order, the answers to the type 3 operations and will contain a single number.

Example

standard input	standard output
4 3 11 1 3 1 1 7 1 1 5 3 3 1 2 1 3 2 1 1 1 4 2 1 5 2 1 6 2 3 1 3 1 3 2 2 2 3 1 2 2 3	15 27 15