E. Inna and Large Sweet Matrix

time limit per test: 1 second
memory limit per test: 512 megabytes
input: standard input
output: standard output

Inna loves sweets very much. That's why she wants to play the "Sweet Matrix" game with Dima and Sereja. But Sereja is a large person, so the game proved small for him. Sereja suggested playing the "Large Sweet Matrix" game.

The "Large Sweet Matrix" playing field is an $n \times m$ matrix. Let's number the rows of the matrix from 1 to n, and the columns — from 1 to m. Let's denote the cell in the i-th row and j-th column as (i, j). Each cell of the matrix can contain multiple candies, initially all cells are empty. The game goes in w moves, during each move one of the two following events occurs:

1. Sereja chooses five integers x_1, y_1, x_2, y_2, v $(x_1 \le x_2, y_1 \le y_2)$ and adds v candies to each matrix cell (i, j) $(x_1 \le i \le x_2; y_1 \le j \le y_2)$.
2. Sereja chooses four integers x_1, y_1, x_2, y_2 $(x_1 \le x_2, y_1 \le y_2)$. Then he asks Dima to calculate the total number of candies in cells (i, j) $(x_1 \le i \le x_2; y_1 \le j \le y_2)$ and he asks Inna to calculate the total number of candies in the cells of matrix (p, q), which meet the following logical criteria: ($p < x_1$ OR $p > x_2$) AND ($q < y_1$ OR $q > y_2$). Finally, Sereja asks to write down the difference between the number Dima has calculated and the number Inna has calculated (D - I).

Unfortunately, Sereja's matrix is really huge. That's why Inna and Dima aren't coping with the calculating. Help them!

Input

The first line of the input contains three integers n, m and w $(3 \le n, m \le 4 \cdot 10^6; 1 \le w \le 10^5)$.

The next w lines describe the moves that were made in the game.

- A line that describes an event of the first type contains 6 integers: $0, x_1, y_1, x_2, y_2$ and v $(1 \le x_1 \le x_2 \le n; 1 \le y_1 \le y_2 \le m; 1 \le v \le 10^9)$.
- A line that describes an event of the second type contains 5 integers: $1, x_1, y_1, x_2, y_2$ $(2 \le x_1 \le x_2 \le n - 1; 2 \le y_1 \le y_2 \le m - 1)$.

It is guaranteed that the second type move occurs at least once. It is guaranteed that a single operation will not add more than 10^9 candies.

Be careful, the constraints are very large, so please use optimal data structures. Max-tests will be in pretests.

Output

For each second type move print a single integer on a single line — the difference between Dima and Inna's numbers.

Examples

input
4 5 5 0 1 1 2 3 2 0 2 2 3 3 3 0 1 5 4 5 1 1 2 3 3 4 1 3 4 3 4

output
2 -21

Note

Note to the sample. After the first query the matrix looks as:

```
22200
22200
00000
00000
```

After the second one it is:

```
22200
25500
03300
00000
```

After the third one it is:

```
22201
25501
03301
00001
```

For the fourth query, Dima's sum equals 5 + 0 + 3 + 0 = 8 and Inna's sum equals 4 + 1 + 0 + 1 = 6. The answer to the query equals 8 - 6 = 2. For the fifth query, Dima's sum equals 0 and Inna's sum equals 18 + 2 + 0 + 1 = 21. The answer to the query is 0 - 21 = -21.