

Problem B

Crystal Reactor

Time limit: 2s
Memory limit: 256MB

A research facility contains a three-dimensional crystal reactor consisting of $N \times M \times P$ cells. Every cell (x, y, z) , where $1 \leq x \leq N$, $1 \leq y \leq M$ and $1 \leq z \leq P$, initially contains zero energy. We interpret x as the row coordinate, y as the column coordinate, and z as the layer coordinate.

The reactor is activated Q times. During one activation, an energy source is placed at the corner (x_1, y_1, z_1) and affects every cell inside the axis-aligned cuboid $[x_1, x_2] \times [y_1, y_2] \times [z_1, z_2]$.

At the source cell (x_1, y_1, z_1) , this activation contributes S units of energy. Starting from that corner, every step of one cell in the positive X direction increases the contribution by A , every step in the positive Y direction increases it by B , and every step in the positive Z direction increases it by C .

The effect exists only inside the given cuboid. If several sources affect the same cell, all of their contributions are added.

After all Q activations have been applied, the control system inspects L cells. For each inspected cell, report the final energy stored in that cell.

Input

- The first line contains five integers N, M, P, Q and L : the reactor dimensions, the number of activations and the number of inspected cells ($1 \leq N, M, P \leq 200$, $N \times M \times P \leq 2 \cdot 10^6$, $1 \leq Q \leq 4 \cdot 10^5$, $1 \leq L \leq 10^6$).
- Each of the next Q lines contains ten integers $x_1, y_1, z_1, x_2, y_2, z_2, S, A, B$ and C ($1 \leq x_1 \leq x_2 \leq N$, $1 \leq y_1 \leq y_2 \leq M$, $1 \leq z_1 \leq z_2 \leq P$, $|S|, |A|, |B|, |C| \leq 10^6$). They describe one activation with source corner (x_1, y_1, z_1) , opposite corner (x_2, y_2, z_2) , initial energy S , and per-step increases A, B and C along the positive X, Y and Z axes, respectively. All cuboid endpoints are inclusive.
- Each of the next L lines contains three integers x, y and z ($1 \leq x \leq N$, $1 \leq y \leq M$, $1 \leq z \leq P$): the coordinates of an inspected cell. Inspection coordinates may repeat.

It is guaranteed that every final cell energy fits in a signed 64-bit integer.

Output

Print L lines. On the i -th line, print the final energy of the i -th inspected cell, in the same order as the inspection coordinates appear in the input.

Sample Input	Sample Output
2 2 3 2 4	10
1 1 1 2 2 3 10 100 10 1	116
2 1 2 2 2 3 5 0 2 3	132
1 1 1	21
2 1 2	
2 2 3	
1 2 2	

Notes

For the first activation, the source at $(1, 1, 1)$ contributes 10 there. Moving one cell along X adds 100, along Y adds 10, and along Z adds 1. Thus, for example, the first activation contributes 111 at $(2, 1, 2)$ and 122 at $(2, 2, 3)$.

The second source is at $(2, 1, 2)$. It contributes 5 at that cell; one step along Y adds 2 and one step along Z adds 3. Therefore the final energies at the four inspected cells are 10, 116, 132 and 21.

- Activations may overlap; all contributions are cumulative.
- S , A , B and C may be negative.
- There are no inspections between activations; all L inspections occur after all Q activations.
- The inspection points are arbitrary; no distributional assumption should be made about them.