Meteo

Mouse Stofl has a friend, mouse Thomas who works for SpaceX, the best aeorspace manufactorer in Mouseland. SpaceX is famous for their excellent mouse engineers, who develop rockets that are reusable. For the safe return of the rockets from space the engineers desperately need exact informations about the temperature and air pressure of the air space above Mouseland. To have even more accurate informations, the mice have programmed a weather forecast system.

This system splits the 3D-room in cubes of $1 \times 1 \times 1$ meter and predictes the temperature for each cube (from which we can calculate the air pressure). To coordinate the landing of the rocket the engineers need to know the average temperature of an air region. Because mouse Thomas is busy with system checks before the launch he asked Stofl to come up with a programme for this specific task.

The average temperature T of a region is composed of N $1 \times 1 \times 1$ cubes whos predicted temperatures are $t_1, t_2, ..., t_N$ is defined as:

$$T = \frac{1}{N} \sum_{i=1}^{N} t_i$$

Mouseland is a rectangle with a length of L meters and a width of B meters. SpaceX includes the air space up to H meters for their calculations. The regions which mouse Thomas wants to know the average temperature of are all cuboids.

The x-axis of our coordinate system has length L, the y-axis has length B and the z-axis has length H.

During the course of the day Thomas gets new predictions. He would therefore like to have the possibility to adjust the temperature of some cubes.

Input

The first line of the input contains three strictly positive integers L, B and H, as described above (and seperated by a single space).

Then you get the $L \times B \times H$ predicted temperatures of the $1 \times 1 \times 1$ cubes in the following format:

You receive H levels, beginning with the level, that represents the height from $z = 0$ to $z = 1$ and ending with the level for the height from $z = H - 1$ to $z = H$. For each level you get exactly B seperate lines ordered by ascending y-coordinates with L integers (seperated by spaces), which are ordered by asecending x-coordinates.

On the next line is a strictly positive integer Q. Each of the following Q lines represents a single request from mouse Thomas.

A request either begins with a C or a M.

A request of type C indicates a new prediction and contains four integers x, y, z, d. This indicates, that the prediction for the temperature in the cube with the corners x, y, z and $x + 1, y + 1, z + 1$ is now d. The coordinates fulfill the following criterias:

- $0 \leq x < L$
- $0 \leq y < B$
- $0 \leq z < H$

A request of type M contains six integers x_1, y_1, z_1 and x_2, y_2, z_2 (seperated by spaces). The point (x_1, y_1, z_1) and the point (x_2, y_2, z_2) are two corners of the cuboid which we want to know the average temperature of. These coordinates fulfill the following criterias:

- $0 \leq x_1 < x_2 \leq L$
- $0 \leq y_1 < y_2 \leq B$
- $0 \leq z_1 < z_2 \leq H$

Output

Print one line for each request of type M. The i-th line should contain a real-value (decimal number), the average temperature of the cuboid from the i-th request. Values will be accepted if they do not differ more than 10^{-5} from the exact solution[#]_.

Remarks

Please consider that a *cube* is not the same as a *cuboid*! The edges of a cube all have the same length, this is not necessarily true for a cuboid. Whenever a cube is mentioned in this task, we speak of $1 \times 1 \times 1$ cubes and for all cuboids the length of the edges are strictly positive.

Limits

All testcases hold:

- $1 \leq L, B, H \leq 100$
- $1 \leq Q \leq 2 \cdot 10^5$

All temperatures are integers between -10^9 and 10^9 inclusive, both the initial predictions and the requests of type C.

There are four testgroups, each is worth 25 points:

- Group 1 holds $1 \leq L, B, H \leq 10$ and $1 \leq Q \leq 1000$, addidtionaly all temperatures are integers between -10^6 and 10^6 inclusive.
- Group 2 holds $L, B, H \leq 75$ and $Q \leq 10^5$, addidtionaly there are no requests of type C.
- Group 3 holds $L, B, H \leq 75$ and $Q \leq 10^5$.
- In group 4 there are no further restrictions.

Warning: The in- and output can be very large. We strongly recommend to include these two statements at the beginning of the `main`-function for faster IO operations:

```
int main() {
  std::cin.tie(0);
  std::ios::sync_with_stdio(false);
  ...
```

[1] The numbers are chosen in a way, that you shouldn't worry about it. But if you want to know it exactly: We check both absolute and relative errors of 10^{-5}. Visit Google Code Jam FAQ for a formal definition.

Examples

Input	Output
4 3 2 4 5 3 6 7 8 8 6 7 8 7 7 2 0 -1 -1 -2 -2 2 1 1 1 -1 0 4 M 1 0 1 3 2 2 M 1 1 0 4 3 2 C 1 1 1 10 M 1 0 1 3 2 2	-0.25 3.75 2.75

The first request is a cuboid with dimensions $2 \times 2 \times 1 = 4$ *and the sum of the temperatures is* -1*, therefore the average temperature is* $-1/4 = -0.25$*. The second request is a cuboid with dimensions* $3 \times 2 \times 2 = 12$ *and the sum of the temperatures is* 45*, therefore the average temperature is* $45/12 = 3.75$*. After the request of type C the sum of the temperatures of the cuboid is* 11*, therefore the average temperature is* $11/4 = 2.75$*.*