Problem D: Rainfall

Advanced Algorithms for Programming Contests

Restrictions

Time: 2 seconds
Memory: 512 MB

Problem description

The National Weather Service wants to provide a new online tool in which users can look up the projected rainfall for their location (a cell on an $M \times N$ grid that models the country) by a single request. Since the meteorologists working there can't code, they hired you to help them by writing a program that can quickly process large amounts of queries of the forms

- RAIN x_1 y_1 x_2 y_2 r
  denoting a projected rainfall of r mm on the area $[x_1, x_2]_\mathbb{N} \times [y_1, y_2]_\mathbb{N}$ (i.e. on all cells (x, y) where $x_1 \leq x \leq x_2, y_1 \leq y \leq y_2$)

- REQUEST x y
  denoting a request of the currently projected rainfall in location (x, y)

s.t. they can run it every day to give their users forecasts for tomorrow.

Input

The input consists of

- one line containing N and M ($3 \leq N, M \leq 1000$) – the width and height of the grid

- many lines, each containing a query of one of the types described above (all numbers involved are integers). The program is supposed to terminate when given the query "REQUEST -1 -1". It is guaranteed that there will be no more then 10^5 queries in a single execution of the program and that all but the terminating query will only contain valid coordinates (i.e. ones ranging from 1 to N in $x-$ and from 1 to M in y-direction) and that the RAIN queries always describe positive amounts of projected rainfall, not exceeding 100 per cell, on non-empty areas.

Output

For every non-terminating query of the `REQUEST` type, output the correct result (in mm) to that request on a separate line.

Sample input and output

Input	Output
3 3	20
RAIN 2 1 3 1 5	0
RAIN 1 1 2 2 15	40
REQUEST 2 1	
RAIN 2 2 3 3 25	
REQUEST 1 3	
REQUEST 2 2	
RAIN 1 1 3 3 100	
REQUEST -1 -1	