

F. Farming

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Ali has just started to do farming after he went into retirement (like most old folks do). He has selected few plants that he deemed worth for him to plant for. After doing some research online (Ali is a tech-savvy grandpa), he found out that some plant requires combination of special fertilizer for them to grow excellent.

However, there are few special fertilizer products in the market. Also, some fertilizer products also have different amount of quantity, which makes it limited to be applied into some areas.

Ali was thinking about doing simulation. Given few fertilizer which costs differently and can be applied to a limited amount of area, he wanted to calculate the amount of costs (read; money) required for a single plant after certain amount of fertilizers have been applied.

You, as his grandchild, is a programmer. So he asked you to solve this problem, which he promised to give some really good candy if you managed to help him!

Input

The first line consists of integer N ($1 \leq N \leq 10,000$), which means $N \times N$ area of Ali's farm size.

Second line consists of integer L ($1 \leq L \leq 10,000$), which means the number of instructions that Ali wants.

The next L lines consist of char P and integer V , where P is a single letter denoting instruction and V is value.

If P is "**F**" (**fertilizer**), then V has values of integers $a1, a2$ ($1 \leq a1 \leq a2 \leq N$), $b1, b2$ ($1 \leq b1 \leq b2 \leq N$), and fc ($1 \leq fc \leq 1000$). $a1/a2$ is row/column of top-left of rectangle, and $b1/b2$ is row/column of bottom-right of rectangle. fc denotes cost of fertilizers for every plant in above mentioned rectangle.

If P is "**Q**" (**query**), then V has integers of $c1$ and $c2$ ($1 \leq c1 \leq c2 \leq N$), which denotes row/column of a cell in Ali's farm. You need to return what is cost of plants in $c1/c2$ after certain amount of fertilizers have been applied.

Output

For every instruction query instruction, output a line with single integer which is total cost of plant's fertilizer in **c1/c2** location.

Sample Input	Sample Output
3 4 F 1 1 3 3 1 F 2 2 3 3 2 Q 1 2 Q 2 3	1 3

Explanation:

After fertilizers have been sprinkled into the farm, here is the visualization of the cost of each plant.

1	1	1
1	3	3
1	3	3

First query asks for cost of location row 1 and column 2, which the value is 1.

Second query asks for cost of location row 2 and column 3, which the value is 3.