

Problem M. Masayoshi Supercomputer

As you may know, IUT has a supercomputer called Masayoshi. It has 458752 CPU cores (who knew?!). Since it has got quite old and currently almost no one uses it, and it also draws a lot of power, we want to reduce the power consumption by underclocking the unused cores. The cluster scheduling algorithm which is in charge of distributing jobs over the nodes and cores of a cluster will issue the following speedstepping commands:

- **change X S**: changes the frequency of core X by S steps.
- **groupchange A B S**: changes the frequency of every core in range $[A, B]$ by S steps.
- **state X**: returns the current state of core X

To be safe for the future, your program should be able to handle 4587520 cores. The initial frequency for each core is 0.

Input

The input contains a single test case. It starts with a line containing three integers C, N , and O , where C is the number of cores ($1 \leq C \leq 4587520$) to manage, N is the number of frequency steps for each core ($1 \leq N \leq 10000$) and O is the number of operations in the test program ($1 \leq O \leq 50000$). Then in each of the following O lines, there exists one command as described above. X, A and B are 0-based IDs of the cores ($0 \leq A, B, X < C; A \leq B$). S is an integer describing the number of steps, possibly negative ($-N \leq S \leq +N$). Both, the change and the groupchange commands will increase (or decrease) in single steps and stop as soon as one core in the group reaches the minimum (0) or maximum frequency (N).

Output

Output one line for each operation in the input. For change and groupchange print the changed number of steps, for state print the current state.

Examples

test	answer
10 10 5	0
state 0	7
groupchange 2 9 7	7
state 9	3
groupchange 0 2 10	-3
change 0 -5	
4587520 10000 5	9950
groupchange 0 4587010 9950	42
groupchange 23 4587000 42	-1000
groupchange 4710 4587001 -1000	8992
state 1234560	1008
groupchange 6666 3060660 10000	