Problem H

JuQueen

JuQueen is the super computer with the best performance allover Germany. It is on rank 8 in the famous top500 list with its 458 752 cores. It draws a lot of energy (up to 2 301 kW), so we want to reduce that 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 4 587 520 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 ($1 \leq C \leq 4\,587\,520$) to manage, N is the number of frequency steps for each core ($1 \leq N \leq 10\,000$) and O is the number of operations in the test program ($1 \leq O \leq 50\,000$). Then follow O lines, each containing 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 number of steps, possibly negative ($-N \leq S \leq +N$).
Both, the `change` and the `groupchange` command will increase (or decrease) in single steps and stop as soon as **one** core in the group reaches the minimal (0) or maximal frequency (N).

Output

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

Sample Input I

```
10 10 5
state 0
groupchange 2 9 7
state 9
groupchange 0 2 10
change 0 -5
```

Sample Output I

```
0
7
7
3
-3
```

Sample Input II

```
4587520 10000 5
groupchange 0 4587010 9950
groupchange 23 4587000 42
groupchange 4710 4587001 -1000
state 1234560
groupchange 6666 3060660 10000
```

Sample Output II

```
9950
42
-1000
8992
1008
```

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