

# Problem JUQUEEN: JuQueen

*JuQueen* is the super computer with the best performance all over 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 1

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

### Sample Output 1

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

### Sample Input 2

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

### Sample Output 2

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