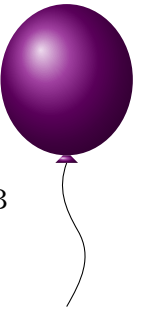


Stogovi

TIME LIMIT: 2s
MEMORY LIMIT: 1024MB



Mirko is playing with stacks. In the beginning of the game, he has an empty stack denoted with number 0. In the i^{th} step of the game he will choose an existing stack denoted with v , copy it and do one of the following actions:

- place number i on top of the new stack
- remove the number from the top of the new stack
- choose another stack denoted with w and count how many different numbers exist that are in the new stack and in the stack denoted with w

The newly created stack is denoted with i .

Mirko doesn't like to work with stacks so he wants you to write a programme that will do it for him. For each operation of type b output the number removed from stack and for each operation of type c count the required numbers and output how many of them there are.

INPUT

The first line of input contains the integer N ($1 \leq N \leq 300\,000$), the number of steps in Mirko's game.

The steps of the game are chronologically denoted with the first N integers.

The i^{th} of the following N lines contains the description of the i^{th} step of the game in one of the following three forms:

- "a v" for operation of type a .
- "b v" for operation of type b .
- "c v w" for operation of type c .

The first character in the line denotes the type of operation and the following one or two denote the accompanying stack labels that will always be integers from the interval $[0, i - 1]$.

For each operation of type b , the stack we're removing the element from will not be empty.

OUTPUT

For each operation type b or c output the required number, each in their own line, in the order the operations were given in the input.

SAMPLES

Sample input 1	Sample output 1
5 a 0 a 1 b 2 c 2 3 b 4	2 1 2

Sample input 2	Sample output 2
11 a 0 a 1 a 2 a 3 a 2 c 4 5 a 5 a 6 c 8 7 b 8 b 8	2 2 8 8

Clarification of the first example: In the beginning, we have the stack $S_0 = \{\}$. In the first step, we copy S_0 and place number 1 on top, so $S_1 = \{1\}$. In the second step, we copy S_1 and place 2 on top of it, $S_2 = \{1, 2\}$. In the third step we copy S_2 and remove number 2 from it, $S_3 = \{1\}$. In the fourth step we copy S_2 and denote the copy with S_4 , then count the numbers appearing in the newly created stack S_4 and stack S_3 , the only such number is number 1 so the solution is 1. In the fifth step we copy S_4 and remove number 2 from it, $S_5 = \{1\}$.