Problem B
DJ Nicholas

DJ Nicholas is a popular DJ for Christmas and New Year events. DJ Nicholas has a battle-tested process for creating his playlists, but he needs help preparing them. His battle-tested process is as follows.

First, he has a stash of k short Christmas song snippets. Since k is at most 26, he assigns the first k letters of the alphabet to the songs in his stash (in the order they would first be played).

He creates an infinitely repeating master track t by repeating his song stash of k songs over and over again. So that the track doesn't get too stale, every time DJ Nicholas would repeat the song stash in the master track, he first *shifts* the order by taking what is currently the first song and then moving it to the end of the stash.

For example, if $k = 4$, then his song stash can be represented by the string `ABCD`, and the master track t can be represented as the infinite string "`ABCD BCDA CDAB DABC ABCD ...`"
(the spaces are shown only for readability; they are not actually in t).

The playlist he prepares can be represented as a string of length n, initially filled with *blanks*. Next, he does q operations on the playlist, where each operation is in one of two forms:

- "`+ i a b`". This takes the segment of songs a through b (inclusive) in the playlist, and **replaces it** with the substring of t that starts at position i and has length $b - a + 1$.
- "`?  a b`". This outputs k integers; the jth such integer is the number of appearances—from among songs a through b (inclusive) in the playlist—of the song represented by the jth letter of the alphabet.
    - DJ Nicholas needs this to keep track of royalties he needs to pay.

Here, we assume both the master track and the playlist are 1-indexed.

You can refer to the sample I/O to see DJ Nicholas' battle-tested process in action!

Help DJ Nicholas answer the above queries and ensure his audience leaves the event merry!

Input Format

The first line of input contains three space-separated integers k, n, and q.

Then, q lines follow, describing the operations. Each line is of either the form "`+ i a b`" or "`?  a b`", corresponding to the operations described above.

Output Format

For every operation of the form "`?  a b`", output a line of k space-separated integers, corresponding to the answer to that query.

Constraints

Constraints
$1 \leq k \leq 26$ $1 \leq n \leq 10^9$ $1 \leq q \leq 10^5$ $1 \leq i \leq 10^9$ in each operation $1 \leq a \leq b \leq n$ in each operation

Sample I/O

Input	Output
4 10 4 + 7 2 6 + 2 8 10 + 9 1 4 ? 4 9	1 2 1 1

Explanation

Here, we have $k = 4$ and $n = 10$. So, $t =$ ABCDBCDACDABDABC...

The playlist is initially empty, so we represent it by this string (where blanks are represented by asterisks):

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If we are to perform the operation "+ 7 2 6", we would note that

- We need a substring of $6 - 2 + 1 = 5$ letters.
- Here we highlight in t the substring that starts at position 7 and is 5 letters long: ABCDBCDACDABDABC...
- Replace songs 2 through 6 in the playlist with this, so our playlist now looks like:

*DACDA****

You can then verify that after "+ 2 8 10", we have the string below:

*DACDA*BCD

Then, with the operation "+ 9 1 4", we *overwrite* some previous songs, ending up with:

CDABDA*BCD

Afterwards, we query "? 4 9", so we look at songs 4 through 9 in the current playlist:

CDABDA*BCD

The four integers we output should be the number of times that A, B, C, and D (respectively) appear in this range at this moment. So, the output should be "1 2 1 1".