Don't Make Zero

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

This is an **interactive problem** (a problem where your program and the judge system interact via input and output).

An integer sequence is called a **non-zero sequence** if it satisfies **both** of the following conditions:

- Any two elements are distinct.
- The sum of any non-empty (not necessarily contiguous) subsequence is not equal to 0.

For example, (5), $(1, -2, 3)$, and $(-3, 7, 5, -6)$ are non-zero sequences, while (0), $(1, -3, 1)$, $(2, 3, -2)$, and $(1, 2, 3, -4)$ are not.

You are given positive integers N and X.

Output, one by one from the beginning, the elements of a non-zero sequence $(A_1, A_2, \ldots, A_X)$ of length X $(= 2\lfloor\sqrt{N}\rfloor - 1)$, consisting of integers between $-N$ and N (inclusive). However, the sign of each element is specified immediately before it is output.

You are given R test cases; interact with the judge for each of them.

Input

- $1 \leq R \leq 10^4$
- $1 \leq N \leq 10^4$
- $X = 2\lfloor\sqrt{N}\rfloor - 1$
- The sum of N over all test cases does not exceed 10^4

Interaction Protocol

First, the number of test cases R is given in the following format:

R

Then the following interaction is repeated R times.

For each test case, positive integers N and X are given in the following format:

N X

After that, for each $i = 1, 2, \ldots, X$ in this order, perform the following interaction.

First, the sign op_i of A_i is given in the following format:

op_i

op_i is one of `+` or `-`, with the following meanings:

- If $\mathrm{op}_i =$ `+`, then A_i must be a positive integer.
- If $\mathrm{op}_i =$ `-`, then A_i must be a negative integer.

Then, output an integer A_i between $-N$ and N (inclusive) with the specified sign, on one line (you do not need to print a sign for positive integers):

A_i

Note

After each output, your program must flush standard output; Otherwise, you will receive Time Limit Exceeded.

Sample Interaction

input	output	explanation
`2`		The number of test cases R is given.
`4 3`		N, X for the first test case are given.
`-`		Since $\mathrm{op}_1 =$ `-`, A_1 must be a negative integer.
	`-4`	You output $A_1 = -4$.
`-`		Since $\mathrm{op}_2 =$ `-`, A_2 must be a negative integer.
	`-1`	You output $A_2 = -1$.
`+`		Since $\mathrm{op}_3 =$ `+`, A_3 must be a positive integer.
	`2`	You output $A_3 = 2$. Since $(A_1, A_2, A_3) = (-4, -1, 2)$ is a non-zero sequence, this test case is considered correct.
`3 1`		N, X for the second test case are given.
`+`		Since $\mathrm{op}_1 =$ `+`, A_1 must be a positive integer.
	`3`	You output $A_1 = 3$. Since $(A_1) = (3)$ is a non-zero sequence, this test case is considered correct.