Handball Training

Handball is a game of skills and brain. The innovative coaching staff of Pick Szeged developed a new training exercise to improve the fast thinking and passing accuracy of their players. There are N players numbered from 0 to $N-1$. The players are standing clockwise around a circle, with player 0 holding a ball.

The coach repeadetly calls out one of the following two instructions:

1. a number T, indicating that the ball is to be passed to the player who is T positions clockwise from the current player holding the ball, wrapping around the circle if necessary. If T is negative, then the pass is to the counter-clockwise direction. If T is 0 (or $N, -N, 2N, -2N$, etc.) then the current player throws up the ball and then catches it. This still counts as a pass.
2. the phrase `undo` M, indicating that the last M passes should be undone and the ball should be passed back to the player who was holding it M passes before. Note that `undo` commands never undo other `undo` commands; they just undo instructions of the first type.

For example, if there are 5 players, and the coach calls out the instructions `8 -2 3 undo 2`, the ball is passed from player 0 to player 3; then from player 3 to player 1; then from player 1 to player 4. Finally, the `undo 2` instruction results in the ball being thrown back from player 4 to player 1 and then from player 1 back to player 3.

Your task is to write a program that determines the last player holding the ball from a list of instructions by the coach.

Input

The first line of the input contains two positive integers N and K ($1 \leq N \leq 30$, $1 \leq K \leq 100$) indicating the number of players and the number of instructions, respectively.

The second line contains K instructions. Each instruction is either an integer T ($-10\,000 \leq T \leq 10\,000$), indicating how many positions to throw the ball clockwise, or `undo` M ($M \geq 1$), indicating that the last M throws should be undone. The commands never undo beyond the start of the training.

Output

Print the player with the ball at the end of the training.

Examples

input	output
5 4 8 -2 3 undo 2	3
5 9 7 -3 undo 1 4 3 -9 5 undo 2 undo 1	1
10 6 8 -2 3 undo 2 1 undo 2	0