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 repeatedly 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 \( T = 0 \) (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

<table>
<thead>
<tr>
<th>input</th>
<th>output</th>
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</table>
| 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      |