## Shuffling cards

## English

## Vietnamese

A deck of 2 N cards with distinct values of $1,2, \ldots, 2 \mathrm{~N}$ is given to the shuffling machine. At the beginning, the cards are arranged in the deck in ascending order from the top to the bottom. The shuffling machine executes a sequence of M instructions determined by M integers $\mathrm{k} 1, \mathrm{k} 2, \ldots, \mathrm{kM}$ for shuffling the cards. The instruction determined by the number ki $(1 \leq|k i|<N)$, commands the machine to shuffle the cards as follows:

- If $\mathrm{ki}>0$ : remove a pile of 2 ki cards at the middle of the deck and stacks them on top of the deck.
- If $\mathrm{ki}<0$ : remove a pile of -2ki cards at the middle of the deck and inserts them into bottom of the deck.

Mr. X received the deck after it has been shuffled according to M instructions. He wants to throw away some cards from the deck in such a way that the values of the remained cards are in an increasing order from the top to the bottom. Given the M instructions for the shuffling machine, your task is to write a program to help Mr. X determine the minimum number of cards to be removed after the deck has been shuffled.


Input
The first line contains two positive integers $N$ and $M\left(2 \leq N \leq 10^{\wedge} 9 ; 0 \leq M \leq 10^{\wedge} 5\right)$ separated by a space. The second line contains M integer k1, k2,..., kM separated by a space.

Output
The minimum number of cards to be removed after the deck has been shuffled.
Sample Input
32
$-21$
Sample Output

