

# Accumulator Apex

Time limit: 3 seconds  
Memory limit: 1024 megabytes

Allyn is playing a new strategy game called “Accumulator Apex”. In this game, Allyn is given the initial value of an integer  $x$ , referred to as the accumulator, and  $k$  lists of integers. Allyn can make multiple turns. On each turn, Allyn can withdraw the leftmost element from any non-empty list and add it to the accumulator  $x$  if the resulting  $x$  is non-negative. Allyn can end the game at any moment. The goal of the game is to get the largest possible value of the accumulator  $x$ . Please help Allyn find the largest possible value of the accumulator  $x$  they can get in this game.

## Input

The first line of the input contains two integers  $x$  and  $k$  ( $0 \leq x \leq 10^9, 1 \leq k \leq 10^5$ ) — the initial value of the accumulator  $x$  and the number of lists. The next  $k$  lines contain the description of lists: an integer  $l_i$  ( $l_i \geq 1$ ) followed on the same line by  $l_i$  elements of the list in the order from left to right. Each element of lists does not exceed  $10^9$  by the absolute value, and the total size of all lists does not exceed  $10^5$ .

## Output

The sole line of the output should contain the largest value of the accumulator  $x$  Allyn can get.

## Examples

standard input	standard output
1 3 2 -1 2 2 -2 3 2 -3 4	4
1 2 3 -1 -1 4 4 1 -3 -4 8	4

## Note

In the first input, we start with  $x = 1$ . Then, we can take the first integer from the first list and get  $x = 0$  — adding the next integer 2 from the first list we get  $x = 2$ . After that, we can add the integers from the second list and obtain  $x = 3$ . Finally, we can add the integers from the third list and obtain  $x = 4$ .

In the second input, we can add the first integer from the second list and get  $x = 2$ . Then, by adding the elements from the first list, we get  $x = 4$ . We cannot add more integers to increase  $x$ .