

# Green Line

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            1 second  
Memory limit:         256 megabytes

There are  $n$  trees growing in one line on a largest street in Yesik city. Height of the  $i$ -th tree from the left is equal to  $a_i$ . At the end of each minute, the following transformation happens:

- If at least one neighbor of the tree  $i$  is taller, then the  $i$ -th tree will grow by 1 unit. More formally, at least one of the conditions  $a_{i-1} > a_i$  or  $a_{i+1} > a_i$  should be satisfied. Here we suppose that  $a_0 = a_{n+1} = 0$ .

Note that the transformation happens simultaneously for all trees. For example, if the current tree heights are equal to  $[3, 3, 4, 2, 2]$ , in the next minute heights will be equal to  $[3, 4, 4, 3, 2]$ .

The initial tree heights correspond to the 0-th minute. You have to answer  $q$  independent queries of the following type.

- What is the height of  $x$ -th tree at the beginning of  $t$ -th minute?

## Input

First line contains two integers  $n$  and  $q$  ( $2 \leq n \leq 10^5$ ,  $1 \leq q \leq 10^5$ ) — number of trees and number of queries.

Second line contains  $n$  integers  $a_1, \dots, a_n$  ( $1 \leq a_i \leq 10^{18}$  for all  $i$ , where  $1 \leq i \leq n$ ) — initial heights of all trees.

Next  $q$  lines contain pairs  $(x_i, t_i)$  ( $1 \leq x_i \leq n$ ,  $0 \leq t_i \leq 10^{18}$ ) — descriptions of queries.

## Output

Print  $q$  integers — answers to all queries in order of their appearance in the input.

## Scoring

Subtask	Additional Constraints	Points	Necessary subtasks
0	Examples	0	—
1	$n \leq 100$ , $a_i \leq 100$ for all $1 \leq i \leq n$	6	0
2	$n \leq 100$	21	1
3	$n \leq 2000$	20	2
4	—	53	3

## Example

standard input	standard output
5 4	2
1 3 2 5 1	3
3 0	4
1 3	3
3 2	
5 2	

## Note

Heights of all trees in the example are equal to:

- $[1, 3, 2, 5, 1]$  in the 0-th minute;
- $[2, 3, 3, 5, 2]$  in the 1-st minute;
- $[3, 3, 4, 5, 3]$  in the 2-nd minute;
- $[3, 4, 5, 5, 4]$  in the 3-rd minute