

## Problem F. Vacation

Input file: standard input  
 Output file: standard output  
 Time limit: 4 seconds  
 Memory limit: 1024 megabytes

Prof. Pang has an annual leave of  $c$  days and he wants to go on vacation.

Now there are  $n$  days in a year. Prof. Pang can gain  $a_i$  happiness if he rests on the  $i$ -th day. The values of happiness,  $a_i$ , may be negative.

Prof. Pang wants you to do  $m$  operations:

- 1  $x$   $y$ , change the happiness of the  $x$ -th day to  $y$ .
- 2  $l$   $r$ , Prof. Pang wants to find a period of vacation in  $[l, r]$ . He wants to rest for several (possibly 0) days in a row and gain as much happiness as possible. However, he only has  $c$  days off, thus he can rest for no more than  $c$  consecutive days in  $[l, r]$ .

That means he wants to find

$$\max \left( \max_{\substack{l \leq l' \leq r' \leq r \\ r' - l' + 1 \leq c}} \left( \sum_{i=l'}^{r'} a_i \right), 0 \right).$$

### Input

The first line contains three integers  $n, m, c$  ( $1 \leq n \leq 2 \times 10^5, 1 \leq m \leq 5 \times 10^5, 1 \leq c \leq n$ ) indicating the number of days in a year, the number of operations, and Prof. Pang's annual leave days.

The next line contains  $n$  integers  $a_1, a_2, \dots, a_n$  ( $-10^9 \leq a_i \leq 10^9$ ) indicating the values of happiness of every day.

The next  $m$  lines are the  $m$  operations in the format described above.

It is guaranteed that  $1 \leq x \leq n, -10^9 \leq y \leq 10^9, 1 \leq l \leq r \leq n$ .

### Output

For each operation of the second type, print the answer.

### Example

standard input	standard output
5 6 3	8
0 -5 -3 8 -3	10
2 3 5	0
1 2 5	5
2 1 5	
1 4 -3	
2 3 5	
2 1 5	