Problem F

Vacation

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

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

Input

The first line contains three integers n, m, c ($1 \le n \le 2\times 10^5, 1 \le m \le 5\times 10^5, 1 \le c \le n$) 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 $a_1, a_2, \ldots, a_n$ $(-10^9 \le a_i \le 10^9)$ 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 $1 \le x \le n, -10^9 \le y \le 10^9, 1 \le l \le r \le n$.

Output

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

Sample Input	Sample Output
5 6 3 0 -5 -3 8 -3 2 3 5 1 2 5 2 1 5 1 4 -3 2 3 5 2 1 5	8 10 0 5