

Investments

SEASON 10 – FOURTH ROUND



During the current year Uncle Scrooge plans to increase his holdings in various stock companies. In the beginning he has a list of N such companies, numbered from 1 to N , and for each of them he knows what amount of funds S_i he has already invested. Since Uncle Scrooge is extremely consistent in all his actions, he makes his investments only in companies, which form a continuous sequence in his list. In other words, he can decide to invest an amount of C_i more funds in all companies, starting from that with number L_i to that with number R_i in the list. Furthermore, he strictly follows the advice of his financial analyzers, who told him that the holdings in each company must not exceed M . That is why, if according to his investment plan Uncle Scrooge has to invest in a given company and the total amount of holdings in it would become more than M , he increases them only to M and excludes the company from all future financial operations.

Compose a program, which helps Uncle Scrooge to follow his finances by processing K queries of the following two types:

- 1 $L_i R_i C_i$ – makes an investment in each company from L_i to R_i with an amount of funds equal to C_i
- 2 $L_i R_i$ – calculates the current sum of all holdings, invested in the sequence of companies from L_i to R_i

Input

The first line of the input file `investments.in` contains the numbers N , M и K . The second line contains N numbers separated with a single space – the values of the initial holdings S_i . Each of the next K lines, describes a single query in the above-mentioned format.

Output

For each query of the second type on a separate line of the output file `investments.out` print a single number, equal to the sum of the holdings in the corresponding interval.

Constraints

$$1 \leq N, K \leq 2 \times 10^5$$

$$1 \leq M \leq 10^9$$

$$0 \leq S_i \leq M$$

$$1 \leq L_i \leq R_i \leq N$$

$$1 \leq C_i \leq 10^9$$

Example

Input	Output
4 10 7	13
10 2 3 0	23
1 1 4 1	5
2 1 2	33
1 2 3 5	
1 3 4 4	
2 2 4	
2 4 4	
2 1 4	

Explanation

The states of the holdings after each query of the first type are respectively $\{10, 3, 4, 1\}$, $\{10, 8, 9, 1\}$ и $\{10, 8, 10, 5\}$. Note that the holdings in company 1 are initially maximal and the Uncle Scrooge's investment plans do not have effect on it. Likewise, after query 4 the holdings in company 3 would become 13, but since it exceeds the limit, they increase only to 10.