

# 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.