Range Update Range Query Sum

Time: 2 sec / Memory: 256 MB

Problem Statement

Given n integers $a_1, a_2, \ldots, a_n$, your task is to process q queries of the following types:

1. For any given $[\ell, r]$ with $1 \leq \ell \leq r \leq n$ and an integer u, **increase the value of each element between a_ℓ and a_r by u.**
2. For any given $[\ell, r]$ with $1 \leq \ell \leq r \leq n$, report the total sum of the elements between a_ℓ and a_r.

Input

The first input line has two integers n and q : the number of input integers and the number of queries. The second line has n integers $a_1, a_2, \ldots, a_n$: the input integers.

Finally, there are q lines describing the queries.
Each line is either "$1\ \ell\ r\ u$" or "$2\ \ell\ r$", where

- "$1\ \ell\ r\ u$" stands for the query to increase each of $a_\ell, a_{\ell+1}, \ldots, a_r$ by u.
- "$2\ \ell\ r$" stands for the query to report the total sum of $a_\ell, a_{\ell+1}, \ldots, a_r$.

Output

Print the result of each query of type 2.

Constraints

- $1 \leq n, q \leq 2 \cdot 10^5$
- $1 \leq a_i, u \leq 10^6$
- $1 \leq \ell \leq r \leq n$

Example

Input:

```
8 5
3 2 4 5 1 1 5 3
2 2 5
1 1 3 2
2 2 5
2 1 1
2 1 8
```

Output:

```
12
16
5
30
```