D. Problem About Weighted Sum

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

In this problem you are to answer queries about weighted sum of a given array. Formally, you are given an array $a[1 \ldots n]$ of length n. You are to answer queries of two types:

- change on segment: given three integers l, r, d you are to add d to each elements i of the array, such that $l \le i \le r$,
- compute weighted sum: given two integers l, r you are to compute and print $a[l] \cdot 1 + a[l+1] \cdot 2 + \ldots\ a[r] \cdot (r - l + 1)$.

Input

The first line contains two integers n, m ($1 \le n, m \le 10^5$), n is the length of the array, and m is the number of queries.

The second line contains integers $a[1], a[2], \ldots, a[n]$ ($-100 \le a[i] \le 100$) — the given array.

Next m lines contain queries, one per line. Query of the first type is given as "$1\ l\ r\ d$" ($1 \le l \le r \le n, -100 \le d \le 100$), and query of the second type is given as "$2\ l\ r$" ($1 \le l \le r \le n$).

Output

For each query of the second type, print the answer on a separate line.

Examples

input Copy

```
5 4
1 2 3 4 5
1 2 3 1
2 1 3
1 2 3 -1
2 1 5
```

output Copy

```
19
55
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