WOSS Dual Olympiad 2023 J3/S1: Moving Sand

Time limit: 10.0s **Memory limit:** 1G

There are N piles of sand in a line. The ith pile from the left initially has s_i units of sand. Answer Q queries, the ith query contains 3 integers a_i, b_i, and c_i:

If a_i is `1`: move c_i units of sand from the b_ith pile to the ($b_i - 1$)th pile. ($2 \leq b_i \leq N$).

If a_i is `2`: move c_i units of sand from the b_ith pile to the ($b_i + 1$)th pile. ($1 \leq b_i \leq N - 1$).

If a_i is `3`: find the total units of sand in all of the piles between pile b_i and c_i, inclusive. ($1 \leq b_i \leq c_i \leq N$).

The queries will never make you remove more sand from a pile than it contains, or move a negative amount of sand.

Constraints

$1 \leq N, Q \leq 10^6$

$1 \leq s_i \leq 10^3$

Subtask 1 [40%]

All queries will have $a_i = 3$.

Subtask 2 [60%]

No additional constraints.

Input Specification

The first line contains 2 space-separated integers, N and Q.

The second line contains N space-separated integers, the ith integer representing the units of sand in the ith pile.

The next Q lines each contain 3 space-separated integers: a_i, b_i, and c_i.

Output Specification

For each query with $a_i = 3$, output a line containing a single integer: the total units of sand in all of the piles between pile b_i and c_i, inclusive.

Sample Input

```
5 6
4 2 10 3 4
3 2 4
1 2 2
2 3 8
3 1 3
2 1 4
3 2 5
```

Sample Output

```
15
8
21
```

Explanation for Sample

The piles are initially $[4, 2, 10, 3, 4]$.

After the 2nd query they are $[6, 0, 10, 3, 4]$.

After the 3rd query they are $[6, 0, 2, 11, 4]$.

After the 5th query they are $[2, 4, 2, 11, 4]$.