Problem E. Easy Connection

There are n houses in a 1D line. We numbered the house by integers from 1 to n. The i-th house is on coordinate x_i. The numbers are assigned from left to right, so $x_1 < x_2 < \cdots < x_n$ holds.

We have m plans of connecting these houses by telephone wires. The plans are slightly weird to describe: Each plan is represented by two disjoint intervals $[a, b]$ and $[c, d]$ $(1 \le a \le b < c \le d)$. We think that houses $a, \cdots, b$ are so near to each other, so they don't need to be connected by telephone wires. Also, houses $c, \cdots, d$ are so near that they also don't need to be connected by telephone wires. However, we want any house i in $[a, b]$ and any house j in $[c, d]$ to be directly connected by telephone wires. To connect house i and house j, a wire with length $|x_i - x_j|$ is needed.

We want to know for each plan, how much wire is needed to connect all $(b - a + 1) \times (d - c + 1)$ pairs of houses. Given n, $x_{1..n}$, and m plans of the form (a, b, c, d), write a program that calculates the total length of wires needed to connect all desired pairs of houses for each plan.

Input

Your input consists of an arbitrary number of records, but no more than 5.

Each record consists of $m + 2$ lines. The first line contains two integers n $(1 \le n \le 100{,}000)$ and m $(1 \le m \le 100{,}000)$. The second line contains n integers $x_1, x_2, \cdots, x_n$ $(1 \le x_1 < x_2 < \cdots < x_n \le 10^5)$, each separated by a space. The next m lines contain the description of the plans: each of these lines contains four integers a, b, c, d $(1 \le a \le b < c \le d)$.

The end of input is indicated by a line containing only the value -1.

Output

For each given plan, print a line that contains the total length of wires needed to connect all desired pairs of houses for that plan.

Example

Standard input	Standard output
5 2 1 4 7 9 11 1 2 4 5 2 3 4 4 6 1 1 2 3 4 5 6 1 3 4 6 -1	30 7 27

Explanation of the example

For the first plan in the first example:

- (1, 4): $|x_1 - x_4| = |1 - 9| = 8$
- (1, 5): $|x_1 - x_5| = |1 - 11| = 10$
- (2, 4): $|x_2 - x_4| = |4 - 9| = 5$
- (2, 5): $|x_2 - x_5| = |4 - 11| = 7$

So the total length of wires is $8 + 10 + 5 + 7 = 30$.

Time Limit

1 second.