

Problem D. Absolute Pairwise Distance

Input file: *standard input*
Output file: *standard output*
Time limit: 5.5 seconds
Memory limit: 512 mebibytes

John Doe invented a nice way to measure distance between two arrays of different length. Let a_1, \dots, a_{l_1} be the first array and b_1, \dots, b_{l_2} be the second one. Then $d(a, b) = \sum_{i=1}^{l_1} \sum_{j=1}^{l_2} |a_i - b_j|$. Unfortunately, this distance function does not satisfy the triangle inequality, but John decided to conduct a few experiments anyway.

John has a large array a_1, \dots, a_n . For q instances of values (l_1, r_1, l_2, r_2) , he would like to know the values $d((a_{l_1}, a_{l_1+1}, \dots, a_{r_1}), (a_{l_2}, a_{l_2+1}, \dots, a_{r_2}))$. Help him find these values.

Input

The first line contains two integers n and q : the number of elements in the array and the number of queries ($1 \leq n, q \leq 10^5$). The second line contains n integers a_1, \dots, a_n : the elements of John's large array ($0 \leq a_i \leq 10^8$). The next q lines contain four integers each: l_1, r_1, l_2, r_2 , which are the parameters of the respective query ($1 \leq l_1 \leq r_1 \leq n, 1 \leq l_2 \leq r_2 \leq n$).

Output

For each query, print the value of $d((a_{l_1}, a_{l_1+1}, \dots, a_{r_1}), (a_{l_2}, a_{l_2+1}, \dots, a_{r_2}))$ on a separate line.

Example

standard input	standard output
5 5	1
1 2 3 4 5	3
1 1 2 2	6
1 1 2 3	4
1 1 2 4	40
1 2 2 3	
1 5 1 5	