

D. Lipshitz Sequence

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

A function is called Lipschitz continuous if there is a real constant K such that the inequality $|f(x) - f(y)| \leq K \cdot |x - y|$ holds for all x, y . We'll deal with a more... discrete version of this term.

For an array a , we define its Lipschitz constant as follows:

- if $n < 2$,
- if $n \geq 2$, over all $1 \leq i < j \leq n$

In other words, L is the smallest non-negative integer such that $|a[i] - a[j]| \leq L \cdot |i - j|$ holds for all $1 \leq i, j \leq n$.

You are given an array of size n and q queries of the form $[l, r]$. For each query, consider the subarray $a[l..r]$; determine the sum of Lipschitz constants of **all subarrays** of $a[l..r]$.

Input

The first line of the input contains two space-separated integers n and q ($2 \leq n \leq 100\,000$ and $1 \leq q \leq 100$) — the number of elements in array and the number of queries respectively.

The second line contains n space-separated integers a_1, a_2, \dots, a_n .

The following q lines describe queries. The i -th of those lines contains two space-separated integers l_i and r_i ($1 \leq l_i < r_i \leq n$).

Output

Print the answers to all queries in the order in which they are given in the input. For the i -th query, print one line containing a single integer — the sum of Lipschitz constants of all subarrays of $a[l_i..r_i]$.

Examples

input
10 4 1 5 2 9 1 3 4 2 1 7 2 4 3 8 7 10 1 9
output
17 82 23 210

input
7 6 5 7 7 4 6 6 2 1 2 2 3 2 6 1 7 4 7 3 5
output

2
0
22
59
16
8

Note

In the first query of the first sample, the Lipschitz constants of subarrays of with length at least 2 are:

- The answer to the query is their sum.