D. Lipshitz Sequence

time limit per test: 1 second
memory limit per test: 256 megabytes

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

For an array $\mathrm{h}[1..n]$, we define it's Lipschitz constant $L(\mathrm{h})$ as follows:

- if $n < 2$, $L(\mathrm{h}) = 0$
- if $n \ge 2$, $L(\mathrm{h}) = \max \left\lceil \frac{|\mathrm{h}[j] - \mathrm{h}[i]|}{j - i} \right\rceil$ over all $1 \le i < j \le n$

In other words, $L = L(\mathrm{h})$ is the smallest non-negative integer such that $|h[i] - h[j]| \le L \cdot |i - j|$ holds for all $1 \le i, j \le n$.

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

Input

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

The second line contains n space-separated integers $\mathrm{a}[1..n]$ ($0 \le \mathrm{a}[i] \le 10^8$).

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

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 $\mathrm{a}[l_i..r_i]$.

Examples

input Copy

```
10 4
1 5 2 9 1 3 4 2 1 7
2 4
3 8
7 10
1 9
```

output Copy

```
17
82
23
210
```

input Copy

```
7 6
5 7 7 4 6 6 2
1 2
2 3
2 6
1 7
```