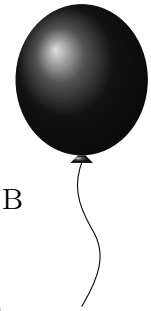
I The Space between Two Worlds



Time limit: 2.0s
Memory limit: 1024MB

Alice and Bob reside in separate worlds. No matter how deeply they yearn to communicate, the universe answers only with an indifferent silence. Between their worlds lies a vast, quiet border where n ancient gates stand in a row. These gates have lain dormant for millennia until one day, perhaps moved by Alice and Bob's wishes, they begin to awaken.

The i-th gate awakens on day p_i. No two gates awaken on the same day; thus, the sequence $p_1, p_2, \ldots, p_n$ is a permutation of $\{1, 2, \ldots, n\}$.

A single awakened gate is merely a lonely fracture in reality. It might carry a fleeting whisper, but it cannot bridge the void. For a contiguous segment of gates to form a true path for Alice and Bob, at least two gates within it must be awakened. Only then does the space between the worlds stabilize enough for their messages to safely cross.

For any gate indices $i < j$, let $\mathrm{sec}(i, j)$ define the exact day the contiguous segment of gates from i to j first contains at least two awakened gates. Equivalently, $\mathrm{sec}(i, j)$ is the second smallest value among $p_i, p_{i+1}, \ldots, p_j$.

You are given q queries. Each query is defined by an interval $[L, R]$. For each query, calculate the sum of the exact days on which every continuous subsegment of length at least two fully contained within $[L, R]$ first becomes able to carry their messages:

$$\sum_{L \le i < j \le R} \mathrm{sec}(i, j).$$

If $L = R$, there is no segment containing at least two gates, so the answer is 0.

Input

The first line contains two integers n and q ($1 \le n, q \le 2 \cdot 10^5$).

The second line contains n integers $p_1, p_2, \ldots, p_n$ forming a permutation of $\{1, 2, \ldots, n\}$.

Each of the next q lines contains two integers L and R ($1 \le L \le R \le n$), describing a query.

Output

Print q lines. The t-th line must contain the answer to the t-th query.

Samples

Sample input 1	Sample output 1
4 4 3 1 4 2 1 4 2 4 1 2 3 3	18 10 3 0

Explanation of sample 1.

- For query $[1, 4]$, the second minimum values over all subarrays of length at least two are $3, 3, 2, 4, 2, 4$, summing to 18.
- For query $[2, 4]$, the values are $4, 2, 4$, summing to 10.
- For query $[1, 2]$, the only valid subarray has second minimum 3.
- For query $[3, 3]$, there is no subarray of length at least two, so the answer is 0.