Problem C. Score Queries

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

Let B be an array of length M. The **score** of B is the number of indices i ($2 \le i \le M-1$) such that there exist indices x and y satisfying $1 \le x < i < y \le M$ and

$$2 \cdot B_i > B_x + B_y$$

You are given an array A of length N.

You need to answer Q queries.

For each query L R ($1 \le L < R \le N$, $R - L + 1 \ge 3$), find

$$\sum_{i=L}^{R-2} \sum_{j=i+2}^{R} \text{score}(A_i, A_{i+1}, \ldots, A_j)$$

In other words, find the sum of scores over all subarrays of length at least 3 fully contained inside $A_L, A_{L+1}, \ldots, A_R$.

Input

The input is given in the following format:

T
N Q
A_1 A_2 $\cdots$ A_N
L_1 R_1
$\vdots$
L_Q R_Q
$\vdots$

- All input values are integers.
- $1 \le T \le 10^4$
- $3 \le N \le 5 \times 10^5$
- $1 \le Q \le 5 \times 10^5$
- $1 \le L < R \le N$ and $R - L + 1 \ge 3$.
- It is guaranteed that the sum of N over all test cases does not exceed 5×10^5.
- It is guaranteed that the sum of Q over all test cases does not exceed 5×10^5.

Output

For each query, output one integer: the sum of scores over all subarrays of length at least 3 fully contained inside $A_L, A_{L+1}, \ldots, A_R$.

Examples

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

Note

Test case 1: For query $[1, 5]$, the subarrays of length at least 3 are:

- $[2, 5, 1]$, score $= 1$,
- $[5, 1, 3]$, score $= 0$,
- $[1, 3, 4]$, score $= 1$,
- $[2, 5, 1, 3]$, score $= 1$,
- $[5, 1, 3, 4]$, score $= 1$,
- $[2, 5, 1, 3, 4]$, score $= 2$.

So, the answer is 6.