Accent

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	512 megabytes

The accent is on 'pe'.

— Dan The Badger, *Uncountable Talents*

Dan The Badger and Sorin The Golden Child gathered in the studio one day to solve a problem. Dan told Sorin that for any array the accent falls on the third smallest number. Thus, we can denote $f(b_1, b_2, ..., b_k)$ to be the third smallest number among b_1, b_2,..., b_k. If a number appears multiple times, it is counted multiple times. Now, they have an array a_1, a_2,..., a_n and q queries of the form (l, r) for which they have to determine the following:

$$\sum_{i=l}^{r-2} \sum_{j=i+2}^{r} f(a_i, a_{i+1}, ..., a_j)$$

Input

The first line of input contains the numbers n and q ($3 \leq n, q \leq 5 \cdot 10^5$).

The second line contains n numbers a_1, a_2,..., a_n ($1 \leq a_i \leq 10^6$).

The next q lines contain two numbers, l and r ($1 \leq l, r \leq n$ and $r \geq l + 2$), denoting a query.

Output

The first q lines will contain one number each, representing the answer for the corresponding query.

Example

standard input	standard output
6 4 1 2 4 3 4 4 2 4 1 4 3 6 1 6	4 11 12 37

Note

For the first query, we have $f(1, 2, 4) = 4$.

For the second query, we have $f(1, 2, 4) + f(2, 4, 3) + f(1, 2, 4, 3) = 4 + 4 + 3 = 11$.

For the thirs query, we have $f(4, 3, 4) + f(3, 4, 4) + f(4, 3, 4, 4) = 4 + 4 + 4 = 12$