
Queries

Input file: **standard input**
Output file: **standard output**
Time limit: 4 seconds
Memory limit: 256 megabytes

You're given a sequence of numbers A of length N and Q queries. Each query is described by two numbers L and R . Before each query, all elements that *don't* satisfy the condition $L \leq A_i \leq R$ are erased. If X is the remaining sequence, then you need to calculate the value: $|X_1 - X_2| + |X_2 - X_3| + \dots + |X_{k-1} - X_k|$, where k is the number of elements in X . After processing the query, all removed elements are restored back. Note that when $k \leq 1$, answer is 0.

Input

The first line of input contains two positive integers N and Q ($1 \leq N, Q \leq 200000$) — the number of elements in the sequence and the number of queries.

The next line contains N integers A_1, A_2, \dots, A_N ($1 \leq A_i \leq 10^9$) — description of sequence A .

The next Q lines each contain two integers L and R ($1 \leq L, R \leq 10^9$) — descriptions of the queries.

Output

For each query print the answer — sum of the absolute difference between each neighbor pair in the remaining subsequence.

Scoring

This problem is made up of 8 subtasks, that meet the following constraints:

1. $N, Q \leq 1000$. Worth 7 points.
2. $a_i \leq a_{i+1}$. Worth 9 points.
3. $a_i \leq 300$. Worth 10 points.
4. $l_i \leq l_{i+1}, r_i \leq r_{i+1}$. Worth 13 points.
5. $N, Q \leq 50000$. Worth 10 points.
6. $N, Q \leq 75000$. Worth 11 points.
7. $N, Q \leq 100000$. Worth 11 points.
8. Original problem constraints. Worth 29 points.

Example

standard input	standard output
10 10	0
2 4 7 10 6 8 6 2 6 4	14
3 4	4
2 6	0
3 6	0
3 4	20
8 8	11
1 9	0
6 10	0
3 5	10
4 4	
3 8	