Problem I. Easy Fix

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	512 mebibytes

Since Grammy plays Hollow Knight day and night and forgets the homework Tony gives her, she already has no time to do it. As a talented programmer and good friend of Grammy, you decide to help her. The problem is described as follows.

Given a permutation $p = p_1, p_2, \ldots, p_n$. We define A_i as the number of j satisfying that $j < i \wedge p_j < p_i$, B_i as the number of j satisfying that $j > i \wedge p_j < p_i$, and $C_i = \min(A_i, B_i)$.

There are m queries. For the i-th query, you should output the value of $\sum_{i=1}^{n} C_i$ if we swap p_u and p_v. Note that we will recover the permutation p after each query which means queries are independent of each other.

Input

The input contains only a single case.

The first line contains one positive integer n ($1 \le n \le 100\,000$). It is guaranteed that p is a permutation of $1, 2, \ldots, n$.

The second line contains n **distinct integers** $p_1, p_2, \ldots, p_n$ ($1 \le p_i \le n$).

The third line contains one positive integer m ($1 \le m \le 200\,000$).

The following m lines describe m queries. The i-th line contains two integers u and v ($1 \le u, v \le n$), denoting the parameter of the i-th query. Note that u may be equal to v.

Output

The output contains m lines. Each line contains one integer, denoting the answer to the i-th query.

Examples

standard input	standard output
7 1 6 2 7 5 4 3 7 1 7 2 6 3 5 4 4 1 1 2 1 3 7	7 6 6 7 7 6 8
5 5 3 1 2 4 3 3 1 2 5 3 3	3 0 0