

Sum of Pairwise Products

Given N non negative numbers, the task is to answer M queries.

Each query is as follows:

Given u,v you need to find the pairwise product sum (u and v are zero indexed)

$$a_u a_u + a_{u+1} a_{u+1} + a_{u+1} a_u + a_{u+2} a_{u+2} + a_{u+2} a_{u+1} + a_{u+2} a_u + \dots + a_v a_v + a_v a_{v-1} + \dots + a_v a_u$$

Input

N
a₀ a₁ ... a_{N-1}
M
u₁ v₁
u₂ v₂
...
u_M v_M

Output

Print the answer for each query in a separate line.

Example

Input:

5
2 0 1 3 3
3
0 2
1 2
3 4

Output:

7
1
27

Constraints

0 <= u <= v < N
N <= 100000
M <= 100000
0 <= a_i <= 1000000