

D. Friends and Subsequences

time limit per test: 2 seconds
memory limit per test: 512 megabytes
input: standard input
output: standard output

Mike and !Mike are old childhood rivals, they are opposite in everything they do, except programming. Today they have a problem they cannot solve on their own, but together (with you) — who knows?

Every one of them has an integer sequences a and b of length n . Being given a query of the form of pair of integers (l, r) , Mike can instantly tell the value of $\max\{a_l, a_{l+1}, \dots, a_r\}$ while !Mike can instantly tell the value of $\min\{b_l, b_{l+1}, \dots, b_r\}$.

Now suppose a robot (you!) asks them all possible different queries of pairs of integers (l, r) ($1 \leq l \leq r \leq n$) (so he will make exactly $n(n+1)/2$ queries) and counts how many times their answers coincide, thus for how many pairs is satisfied.

How many occasions will the robot count?

Input

The first line contains only integer n ($1 \leq n \leq 200\,000$).

The second line contains n integer numbers a_1, a_2, \dots, a_n ($-10^9 \leq a_i \leq 10^9$) — the sequence a .

The third line contains n integer numbers b_1, b_2, \dots, b_n ($-10^9 \leq b_i \leq 10^9$) — the sequence b .

Output

Print the only integer number — the number of occasions the robot will count, thus for how many pairs is satisfied.

Examples

input
6 1 2 3 2 1 4 6 7 1 2 3 2
output
2

input
3 3 3 3 1 1 1
output
0

Note

The occasions in the first sample case are:

1. $l=4, r=4$ since $\max\{2\} = \min\{2\}$.

2. $l=4, r=5$ since $\max\{2, 1\} = \min\{2, 3\}$.

There are no occasions in the second sample case since Mike will answer 3 to any query pair, but !Mike will always answer 1.