

Problem K. Prefix MEX Equation

Input file: `standard input`
Output file: `standard output`
Time limit: 3 seconds
Memory limit: 1024 megabytes

Suppose you have two arrays X and Y , both of length M . You can perform the following operation however many times you like:

- Choose an index i ($1 \leq i \leq M$), and swap X_i with Y_i .

The pair of arrays (X, Y) is said to be **good** if it is possible to make their prefix MEX arrays equal by performing several such swaps.

The MEX of a set of integers is the smallest non-negative integer that does not appear in the set.

The prefix MEX array of an array Z is an array P of the same length as Z such that

$$P_i = \text{MEX}(Z_1, Z_2, \dots, Z_i)$$

for each $1 \leq i \leq |Z|$.

You are given two arrays A and B , both of length N .

Count the number of pairs (L, R) such that $1 \leq L \leq R \leq N$ and the pair of subarrays

$$(A_L, A_{L+1}, \dots, A_R) \quad \text{and} \quad (B_L, B_{L+1}, \dots, B_R)$$

is good.

Input

The input is given in the following format:

T
N
$A_1 A_2 \dots A_N$
$B_1 B_2 \dots B_N$
\vdots

- All input values are integers.
- $1 \leq T \leq 10^5$
- $1 \leq N \leq 2 \times 10^5$
- $0 \leq A_i \leq N$
- $0 \leq B_i \leq N$
- It is guaranteed that the sum of N over all test cases does not exceed 2×10^5 .

Output

For each test case, output a single integer — the number of pairs (L, R) such that $1 \leq L \leq R \leq N$ and the pair of arrays (A_L, \dots, A_R) and (B_L, \dots, B_R) is good.

Examples

standard input	standard output
3	2
4	6
0 2 1 0	4
0 1 0 2	
3	
1 2 1	
2 1 1	
4	
0 0 3 1	
2 0 1 1	

Note

Test case 1: The valid pairs are (1, 1) and (2, 2).

Test case 2: All pairs are valid.

Test case 3: The valid pairs are (2, 2), (3, 3), (4, 4), and (3, 4).