

Permutation Intersections - Hard

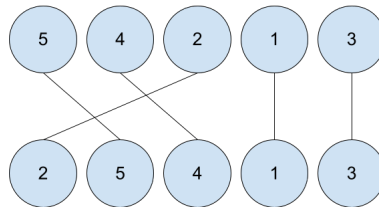
Input file: standard input
Output file: standard output
Time limit: 3 seconds
Memory limit: 256 megabytes

The only difference between the easy and hard version of the problem is the size of the constraints.

In this problem, you are given two permutations A and B of N numbers, and you need to play a game with them! In this game, you are required to perform the following steps:

1. For each number x , draw a line segment connecting between its positions in the given permutations.
2. Count the number of intersections between the line segments.

For example, let us consider two permutations $(5, 4, 2, 1, 3)$ and $(2, 5, 4, 1, 3)$. The following picture shows the permutations after drawing all line segments. In the picture, the number of intersections between the line segments is 2.



Given the permutations A and B , your task is to play the game and to count the number of intersections between the line segments.

Input

The first line contains an integer T ($1 \leq T \leq 100$) — the number of test cases.

The first line of each test case consists of an integer N ($1 \leq N \leq 100000$) — the size of the permutation.

Then a line follows, consisting of N distinct number A_1, A_2, \dots, A_n ($1 \leq A_i \leq N$) — the first permutation A .

Then another line follows, consisting of N distinct number B_1, B_2, \dots, B_n ($1 \leq B_i \leq N$) — the second permutation B .

The sum of N over all test cases does not exceed $7 \cdot 10^5$.

Output

For each test case, print a single line containing the number of intersections.

Example

standard input	standard output
2	2
5	1
5 4 2 1 3	
2 5 4 1 3	
4	
1 2 3 4	
1 2 4 3	