Problem L. Not Another Constructive Problem

Consider a tree $T = (V, E)$ with n vertices, labeled from 1 to n. The i-th vertex initially has a value p_i. All the values of p_i are distinct integers from 1 to n. In other words, p_i is a permutation of length n.

You are asked to perform the following operations $n - 1$ times:

- Select an edge $e = (x, y) \in E$.
- Swap the value of p_x and p_y.
- Remove the edge e from E.

In the end, T will become a graph without any edges. Such a tree T is called *yummy* if there exists a way to apply these operations, such that p_i becomes q_i for all $1 \le i \le n$.

You may think Little Cyan Fish would like to find a plan to prove T is *yummy*. But we have too many constructive problems in this contest! Therefore, he gives you an undirected graph G with n vertices and many, many edges. In fact, there are $c_{i,j}$ distinct edges between the vertices i and j.

Little Cyan Fish would like you to count how many *yummy* spanning trees this graph contains. Two spanning trees are considered different if they contain different sets of edges. As the answer can be huge, output the answer modulo $10^9 + 7$.

Input

The first line of the input contains a single integer n ($1 \le n \le 500$), indicating the number of nodes of the graph.

The next line of the input contains a permutation $p_1, p_2, \ldots, p_n$, indicating the value on each node initially.

The next line of the input contains a permutation $q_1, q_2, \ldots, q_n$, indicating the value on each node eventually.

The next n lines describe the matrix c, each line with n integers. The j-th integer of the i-th line of these lines describes the value of $c_{i,j}$ ($0 \le c_{i,j} \le 10^9 + 6$), indicating the number of edges between nodes i and j.

It is guaranteed that $c_{i,i} = 0$, and $c_{i,j} = c_{j,i}$ for all $1 \le i, j \le n$.

Output

Output a single line that contains a single integer, indicating the number of *yummy* spanning trees of this graph modulo $10^9 + 7$.

Examples

standard input	standard output
4 1 2 3 4 3 4 2 1 0 1 1 1 1 0 1 1 1 1 0 1 1 1 1 0	12
6 1 2 3 4 5 6 5 3 4 1 6 2 0 3 3 2 1 2 3 0 2 2 2 1 3 2 0 3 2 3 2 2 3 0 1 2 1 2 2 1 0 1 2 1 3 2 1 0	5050