Matrix Inverse

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.5 seconds
Memory limit:	512 megabytes

Given a prime number p, we call a square array of size $n \times n$ with values ranging from 0 to $p-1$ inclusive, a *matrix*. The value in the i-th row and j-th column (for $1 \le i, j \le n$) of matrix M is denoted as $M_{i,j}$. Since we don't know of any other large prime numbers than $10^9 + 7$, we'll now assume that $p = 1\,000\,000\,007$.

We call matrix B the *inverse* of matrix A if the remainder when dividing the sum

$$\sum_{\ell=1}^{n} A_{i,\ell} \cdot B_{\ell,j}$$

by p is 1 when $i = j$, or 0 otherwise.

Matrix A is given. We guarantee that there is exactly one matrix B that is the inverse of matrix A. Your task is to find matrix B.

To make your life easier, we also give you matrix C, which differs from the sought matrix by at most **twelve** elements. Your task is to print a list of elements in which matrix C differs from the desired matrix B.

Input

The first line of input contains one integer n ($1 \le n \le 2000$) denoting the dimension of matrix A.

The next n lines describe matrix A; the i-th of these lines contains n integers, where the j-th number is element $A_{i,j}$ ($0 \le A_{i,j} \le p-1$). We guarantee that there exists exactly one matrix B that is the inverse of matrix A.

The subsequent n lines contain a description of matrix C in a similar format. You can assume that matrix C differs from matrix B in at most twelve elements. Specifically, there are at most twelve distinct pairs of natural numbers (i, j) such that $1 \le i, j \le n$ and $B_{i,j} \ne C_{i,j}$.

Output

The first line of the output should contain a single integer k ($0 \le k \le 12$) denoting the number of elements in matrix C that need to be changed to obtain matrix B.

Each of the next k lines should contain three integers. The numbers in the i-th row, sequentially x_i, y_i, and w_i ($1 \le x_i, y_i \le n$, $0 \le w_i \le p-1$), indicate that in the sought matrix B, it holds that $B_{x_i,y_i} = w_i$, while $C_{x_i,y_i} \ne w_i$. The changed elements should be printed in ascending order of row numbers, and in the event of ties, in ascending order of column numbers.

Note that according to the problem conditions, the correct output is uniquely defined.

Examples

standard input	standard output
2 1 1 0 2 1 2 3 500000004	2 1 2 500000003 2 1 0
3 0 1 0 0 0 1 1 0 0 0 0 1 1 0 0 0 1 0	0

Note

The inverse of the matrix $A = \begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix}$ is the matrix $B = \begin{bmatrix} 1 & 500\,000\,003 \\ 0 & 500\,000\,004 \end{bmatrix}$. Hence, in the matrix C provided in the input, two elements need to be changed.