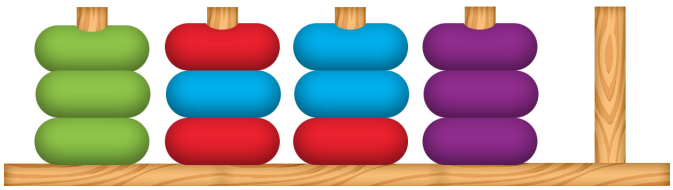
Problem D. Disk Sort

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are given $n + 1$ rods and $3n$ disks. Initially, each of the first n rods contains exactly 3 disks. Each of the disks has one of n colors (identified by numbers from 1 to n). Moreover, there are exactly 3 disks of each of the n colors. The $n + 1$-th rod is empty.



At each step we can select two rods a and b ($a \neq b$) such that a has at least 1 disk and b has at most 2 disks, and move the topmost disk from rod a to the top of rod b. Note that no rod is allowed to contain more than 3 disks at any time.

Your goal is to sort the disks. More specifically, you have to do a number of operations (potentially 0), so that, at the end, each of the first n rods contains exactly 3 disks **of the same color**, and the $n+1$-th rod is empty.

Find out a solution to sort the disks in at most $6n$ operations. It can be proven that, under this condition, a solution always exists. If there are multiple solutions, any one is accepted.

Input

The first line of the input contains a positive integer n ($1 \le n \le 1\,000$). The next 3 lines of the input contain n positive integers $c_{i,j}$ each ($1 \le i \le 3$, $1 \le j \le n$, $1 \le c_{i,j} \le n$), the color each of the disks initially placed on the rods. The first of the 3 lines indicates the upper row, the second line indicates the middle row, and the third line indicates the lower row.

Output

The first line of the output must contain a non-negative integer k ($0 \le k \le 6n$), the number of operations. Each of the following k lines should contain two **distinct** numbers a_i, b_i ($1 \le a_i, b_i \le n + 1$, for all $1 \le i \le k$), representing the i-th operation (as described in the statement).

Examples

standard input	standard output
4 2 3 1 4 2 1 1 4 2 3 3 4	8 3 5 3 5 2 3 2 5 2 3 5 2 5 2 5 2
2 1 2 1 2 1 2	0