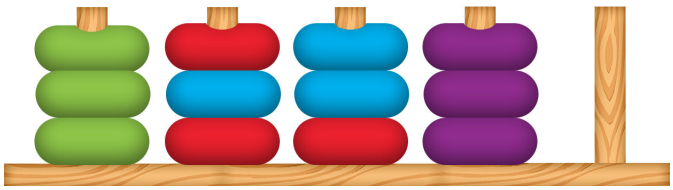
# Problem D. Disk Sort

| | |
|---|---|
| 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<br>2 3 1 4<br>2 1 1 4<br>2 3 3 4 | 8<br>3 5<br>3 5<br>2 3<br>2 5<br>2 3<br>5 2<br>5 2<br>5 2 |
| 2<br>1 2<br>1 2<br>1 2 | 0 |