

Problem K. Balancing Sequences

Input file: **standard input**
 Output file: **standard output**
 Time limit: **3 seconds**
 Memory limit: **1024 megabytes**

After traveling to Gensokyo, Little Cyan Fish obtained two sequences a_1 and a_2 . Each sequence contains n integers ranging from 1 to $2n$. All of the $2n$ integers are pairwise distinct.

He wants to transform a_1, a_2 into b_1, b_2 . Unfortunately, the sequences have a self-balancing system, so the only operation he can perform is to choose four integers (x_1, x_2, y_1, y_2) and swap the elements a_{x_1, x_2} and a_{y_1, y_2} . To protect the self-balancing system, these chosen integers must satisfy:

- $x_1, y_1 \in [1, 2]$ and $x_2, y_2 \in [1, n]$.
- $x_2 \neq y_2$.
- $a_{x_1, x_2} > a_{3-x_1, x_2}$.
- $a_{y_1, y_2} > a_{3-y_1, y_2}$.

Little Cyan Fish would like to know whether he can transform a_1, a_2 into b_1, b_2 , so he asked you for help. If it is possible, you need to provide a plan to guide him.

Input

There are multiple test cases. The first line contains one integer T ($1 \leq T \leq 10^5$), representing the number of test cases.

For each test case, the first line contains one integer n ($2 \leq n \leq 2 \times 10^3$), indicating the size of a_1, a_2, b_1 , and b_2 .

The next line contains n elements, describing a_1 ($1 \leq a_{1,i} \leq 2n$).

The next line contains n elements, describing a_2 ($1 \leq a_{2,i} \leq 2n$). All the $2n$ integers in the sequences a_1 and a_2 are pairwise distinct.

The next line contains n elements, describing b_1 ($1 \leq b_{1,i} \leq 2n$).

The next line contains n elements, describing b_2 ($1 \leq b_{2,i} \leq 2n$). All the $2n$ integers in the sequences b_1 and b_2 are pairwise distinct.

It is guaranteed that the sum of n^2 over all test cases does not exceed 4×10^6 .

Output

If it's not possible to transform the arrays a_1 and a_2 into b_1 and b_2 , output a single line consists a single integer -1 .

Otherwise, output a single integer s ($s \in [0, 5n]$) representing the number of steps required to transform a_1 and a_2 into b_1 and b_2 .

In the next s lines, for each line, output four numbers x_1, x_2, y_1, y_2 ($1 \leq x_1, y_1 \leq 2, 1 \leq x_2, y_2 \leq n$), indicating that you should swap a_{x_1, x_2} and a_{y_1, y_2} in this step.

It can be proven that if the transformation is possible, then it can be completed within $5n$ steps.

Example

standard input	standard output
2	-1
2	1
1 2	2 2 2 1
3 4	
4 3	
2 1	
3	
1 2 4	
3 5 6	
1 2 4	
5 3 6	