Problem K
P to Q

Time limit: 1 second
Memory limit: 1 Gigabyte

Problem Description

You are given 2 permutations P and Q of the integers 1 to N. Your score S is initialized as $\texttt{inversions}(P)^{\dagger}$.

You can do the following operation at most $10 \cdot N$ times:

- Select any integer x satisfying $1 \leq x \leq N$. Delete x from P, and then insert x back into P in any desired location. Replace S with $\max(S, \texttt{inversions}(P))$.

Your goal is to change P into Q while minimizing the final value of S. Also, print the operations performed.
Note that you **do not have to minimize** the number of operations performed.

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† $\texttt{inversions}(P)$ represents the number of pairs (i, j) satisfying $1 \leq i < j \leq N$ and $P_i > P_j$.

Input Format

- The first line of input will contain a single integer T, denoting the number of test cases.
- Each test case consists of three lines of input:
  - The first line of each test case contains N - the permutation length.
  - The second line contains N integers - $P_1, P_2, \ldots, P_N$ representing the permutation P.
  - The third line contains N integers - $Q_1, Q_2, \ldots, Q_N$ representing the permutation Q.

Output Format

For each test case, the output is as follows:

- Firstly, on a new line, output K $(0 \leq K \leq 10 \cdot N)$ - the number of operations you wish to perform.
- Each of the next K lines must contain 2 space-separated integers:
  - x $(1 \leq x \leq N)$: the number we choose to delete and reinsert in this operation; and
  - pos $(1 \leq pos \leq N)$: the position where we reinsert x. Note there are $N - 1$ elements left after deleting x. $pos = i$ means we will reinsert x right before the i-th element, and $pos = N$ means that we will insert it at the end.

Constraints

- $1 \leq T \leq 100$
- $1 \leq N \leq 500$
- $1 \leq P_i, Q_i \leq N$
- $P_i \neq P_j$ for all $i \neq j$
- $Q_i \neq Q_j$ for all $i \neq j$
- The sum of N over all test cases does not exceed 500.

Samples

Sample Input 1

```
3
2
1 2
2 1
3
1 2 3
1 2 3
3
2 1 3
3 1 2
```

Sample Output 1

```
1
1 2
0
2
1 1
3 1
```

Sample Explanation

Test Case 1: Initially, $S = 0$ because $\texttt{inversions}([1, 2]) = 0$.
We perform one operation, which is to delete 1 and re-insert at the 2nd position.
This changes the permutation to $[2, 1]$ and S gets updated to $\max(0, \texttt{inversions}([2, 1])) = 1$.

We have successfully converted P to Q, and it can be proven that it is impossible to have a lower score.

Test Case 3: We show the steps:

- Initial conditions: $P = [2, 1, 3]$, $S = 1$.
- Delete 1 and reinsert at position 1: $P = [1, 2, 3]$, $S = 1$.
- Delete 3 and reinsert at position 1: $P = [3, 1, 2]$, $S = 2$.