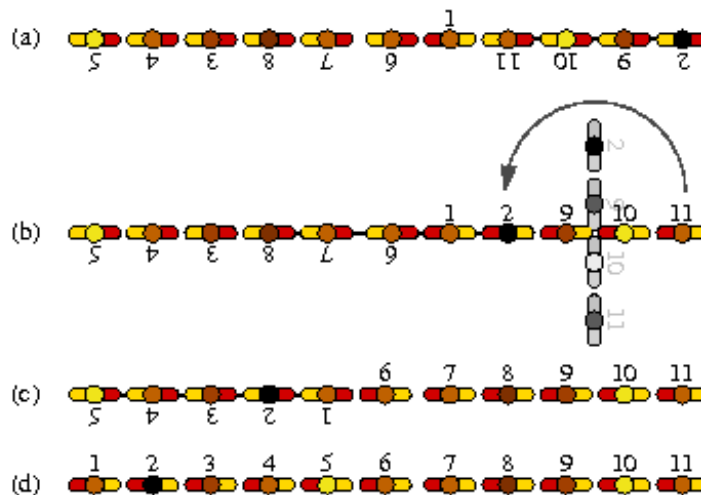


Soccer Choreography

Mr. Bitmann, the coach of the national soccer team of Bitland, is a perfectionist. He taught his players optimal tactics and improved their endurance and shape. So they qualified for the soccer worldcup this year. Due to his perfectionism the coach attaches importance not only to the performance in the game but also before the game. So he told the team captain in what formation the team should assemble before the national anthem is played. Since each of the 11 team members has a unique number between 1 and 11 on his shirt, he can represent the formation as a permutation of numbers.

Before the first game the coach told the captain that the team should line up in increasing order (picture (d)). But some players forgot the ordering and the orientation of the formation like in picture (a). Only player 1 has the right orientation. The coach went nearly mad when he saw this disaster! How could he solve the problem?



"Hmmm... I'll let my players dance!". A great idea! He took his notebook and started to create a choreography which leads to his expected formation. Due to the fact that no one of the players took dancing lessons he restricts his dance to one basic move: One player or more players who stand side by side can turn 180 degrees around the center of the move. Picture (b) contains an example: The players

-11 -10 -9 -2

(we mark players which stand in the wrong direction with a minus) can do one move to

2 9 10 11

As perfect as he is he calculated a dance with a minimum number of moves. It works perfectly and now he's planning to do dancing performances with teams with more than 11 members. So he needs your help to find optimal dancing moves...

Input

Each testcase starts with the number of team members n ($0 \leq n < 2200$). The next lines represent

the formation at the beginning and the expected formation at the end of the choreography.

Output

For each testcase output m , the minimal number of moves which are necessary to reach the expected formation. The next $m+1$ lines should represent one possible scenario of moves.

Example

Input:

```
11
-5 -4 -3 -8 -7 -6 1 -11 -10 -9 -2
1 2 3 4 5 6 7 8 9 10 11
11
1 2 3 -4 -5 -6 -7 -8 -9 10 11
11 9 8 7 6 5 4 3 2 10 1
0
```

Output:

```
3 Steps
-5 -4 -3 -8 -7 -6 +1 -11 -10 -9 -2
-5 -4 -3 -8 -7 -6 +1 +2 +9 +10 +11
-5 -4 -3 -2 -1 +6 +7 +8 +9 +10 +11
+1 +2 +3 +4 +5 +6 +7 +8 +9 +10 +11
5 Steps
+1 +2 +3 -4 -5 -6 -7 -8 -9 +10 +11
+1 +2 -3 -4 -5 -6 -7 -8 -9 +10 +11
+1 -2 -3 -4 -5 -6 -7 -8 -9 +10 +11
+1 -2 -3 -4 -5 -6 -7 -8 -9 -11 -10
+11 +9 +8 +7 +6 +5 +4 +3 +2 -1 -10
+11 +9 +8 +7 +6 +5 +4 +3 +2 +10 +1
```