C. Soldier and Cards

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Two bored soldiers are playing card war. Their card deck consists of exactly n cards, numbered from 1 to n, **all values are different**. They divide cards between them in some manner, it's possible that they have different number of cards. Then they play a "war"-like card game.

The rules are following. On each turn a *fight* happens. Each of them picks card from the top of his stack and puts on the table. The one whose card value is bigger wins this *fight* and takes both cards from the table to the bottom of his stack. More precisely, he first takes his opponent's card and puts to the bottom of his stack, and then he puts his card to the bottom of his stack. If after some turn one of the player's stack becomes empty, he loses and the other one wins.

You have to calculate how many *fights* will happen and who will win the game, or state that game won't end.

Input

First line contains a single integer n ($2 \le n \le 10$), the number of cards.

Second line contains integer k_1 ($1 \le k_1 \le n - 1$), the number of the first soldier's cards. Then follow k_1 integers that are the values on the first soldier's cards, from top to bottom of his stack.

Third line contains integer k_2 ($k_1 + k_2 = n$), the number of the second soldier's cards. Then follow k_2 integers that are the values on the second soldier's cards, from top to bottom of his stack.

All card values are different.

Output

If somebody wins in this game, print 2 integers where the first one stands for the number of *fights* before end of game and the second one is 1 or 2 showing which player has won.

If the game won't end and will continue forever output -1.

Examples

input
4 2 1 3 2 4 2
output
6 2

input
3 1 2 2 1 3
output
-1

Note

First sample:

Second sample:

Codeforces Round #304 (Div. 2)
Finished

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Problem tags

brute force dfs and similar

No tag edit access

→ Contest materials

- Announcement
- Tutorial

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