Problem F

Min Max Convert

Input File: standard input
Output File: standard output
Time Limit: 0.4 seconds (C/C++)
Memory Limit: 256 megabytes

Let A be a sequence of N elements. You can perform two types of operations on this sequence:

1. Select an interval of positions $[a, b](1 \leq a \leq b \leq N)$. Let x be the maximum value on this interval. Replace all the elements in the interval with x.
2. Select an interval of positions $[a, b](1 \leq a \leq b \leq N)$. Let x be the minimum value on this interval. Replace all the elements in the interval with x.

Determine a sequence of operations such that sequence A becomes another given sequence B (of also N elements). The number of operations must be less or equal than $2 * N$.

Input

The first line of the input contains a single number N. The second line contains A, a sequence of N elements. The third line contains B, another sequence of N elements.

Output

If there is **no solution** such that sequence A becomes B, print **–1**. Otherwise, print on the first line a single number x, the minimum number of operations needed to transform sequence A in B. Each of the next x lines will contain a character (the type of the operation: m if the operation use the minimum and M for the maximum) and an interval (a, b), describing the operations needed for the process. If there are multiple solutions, print any of them.

Constraints

- $1 \leq N \leq 100.000$
- All values in A and B are integer numbers from $[1, N]$

Sample input	Sample output
5 1 5 5 3 4 1 1 4 4 4	3 m 1 2 M 4 5 m 3 5
5 1 2 3 4 4 2 2 2 2 5	-1