Problem A. Lock Puzzle

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Welcome to another task about breaking the code lock! Explorers Whitfield and Martin came across an unusual safe, inside of which, according to rumors, there are untold riches, among which one can find the solution of the problem of discrete logarithm!

Of course, there is a code lock is installed on the safe. The lock has a screen that displays a string of n lowercase Latin letters. Initially, the screen displays string s. Whitfield and Martin found out that the safe will open when string t will be displayed on the screen.

The string on the screen can be changed using the operation «`shift` x». In order to apply this operation, explorers choose an integer x from 0 to n inclusive. After that, the current string $p = \alpha\beta$ changes to $\beta^R\alpha$, where the length of β is x, and the length of α is $n - x$. In other words, the suffix of the length x of string p is reversed and moved to the beginning of the string. For example, after the operation «`shift 4`» the string «`abcacb`» will be changed with string «`bcacab` », since $\alpha =$ `ab`, $\beta =$ `cacb`, $\beta^R =$ `bcac`.

Explorers are afraid that if they apply too many operations «`shift`», the lock will be locked forever. They ask you to find a way to get the string t on the screen, using no more than m operations.

Input

The first line contains two integers numbers n and m, the length of the strings s and t, and the maximum number of operations.

After that, there are two strings s and t, consisting of n lowercase Latin letters each.

Output

If it is impossible to get string t from string s using no more than m operations «`shift`», print a single number -1.

Otherwise, in the first line output the number of operations k ($0 \le k \le m$). In the next line output k numbers x_i corresponding to the operations «`shift` x_i» ($0 \le x_i \le n$) in the order in which they should be applied.

Scoring

Subtask	Score	Constraints	
		n	m
1	9	$1 \le n \le 8$	$m = 10\,000$
2	21	$1 \le n \le 100$	$m = 10\,000$
3	24	$1 \le n \le 1\,000$	$m = 10\,000$
4	12	$1 \le n \le 2\,000$	$m = 10\,000$
5	12	$1 \le n \le 2\,000$	$8\,100 \le m \le 10\,000$
6	11	$1 \le n \le 2\,000$	$6\,100 \le m \le 10\,000$
7	11	$1 \le n \le 2\,000$	$5\,100 \le m \le 10\,000$

Examples

standard input	standard output
6 10000 abacbb babcba	4 6 3 2 3
3 10000 aba bba	-1

Explanation

In the first example, after applying the operations, the string on the screen will change as follows:

1. abacbb → bbcaba
2. bbcaba → ababbc
3. ababbc → cbabab
4. cbabab → babcba