

Problem C. Changing the Sequences

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 1024 mebibytes

There are sequences $A = (a_1, \dots, a_N)$ and $B = (b_1, \dots, b_N)$ with the same length N . a_i denotes the i -th element of A , and its value is an integer between 1 and M , and the same is true for b_j , which is the j -th element of the sequence B .

You can do a magic trick to the sequence A only once: you can prepare a permutation $P = (p_1, \dots, p_M)$ of integers from 1 through M , and can change the sequence A to A' by using P as follows: $a'_i = p_{a_i}$ ($1 \leq i \leq N$).

You want to make the distance between the sequence A' and another sequence B closer by changing A to A' through a magic trick.

The *distance* between two sequences is defined as Hamming distance. The Hamming distance between two equal-length sequences is the number of positions at which the corresponding values are different.

Among all possible A' , you have to find a sequence which satisfies all of the following conditions.

- No other possible sequences as A' have a smaller distance to B than the distance between this sequence and B .
- It is the lexicographically smallest sequence among possible sequences which has the same distance between B .

Here, a sequence $X = (x_1, x_2, \dots, x_N)$ is "lexicographically smaller" than another same length sequence $Y = (y_1, y_2, \dots, y_N)$ if and only if the following condition holds: there exists an index i ($1 \leq i \leq N$), such that $x_j = y_j$ for all indices j ($1 \leq j < i$), and $x_i < y_i$.

Input

The first line of the input consists of two integers N ($1 \leq N \leq 100\,000$) and M ($1 \leq M \leq 60$), which represent that the length of sequences are N , and each sequence has N values between 1 and M .

The second line consists of N integers. The i -th integer is denoted a_i ($1 \leq a_i \leq M$).

The third line consists of N integers. The i -th integer is denoted b_i ($1 \leq b_i \leq M$).

Output

Print N integers, with spaces in between. The i -th integer should be the i -th element of a sequence which satisfies all conditions in the problem statement. Each element of a sequence should be printed as an integer.

Examples

standard input	standard output
4 3 2 2 3 3 2 2 2 2	1 1 2 2
5 3 2 2 3 3 2 2 2 2 2 3	3 3 2 2 3