Problem K. Match

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

Given two sequences a and b of length n, a bipartite graph is generated in the following manner:

The nodes of the bipartite graph are divided into two parts: the left side and the right side. There are n nodes on both sides. An edge exists between the i-th node on the left side and the j-th node on the right side if and only if $a_i \oplus b_j \geq k$, where $\oplus$ denotes the bitwise XOR operator.

For each x in the range $[1, n]$, output the number of matchings of size x in the bipartite graph, with the result modulo 998244353.

Input

The first line contains two non-negative integers n, k,$(1 \leq n \leq 200, 0 \leq k < 2^{60})$.

The second line contains n non-negative integers, representing the sequence a,$(0 \leq a_i < 2^{60})$.

The third line contains n non-negative integers, representing the sequence b,$(0 \leq b_i < 2^{60})$.

Output

Output n non-negative integers, where the i-th integer represents the number of matchings of size i in the graph, with the result taken modulo 998244353.

Example

standard input	standard output
9 5 1 7 2 8 4 9 2 5 10 1 3 2 4 5 8 8 8 9	51 1034 10768 62195 200965 348924 294444 97344 7200