

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