

Matrix Power Series

<https://vjudge.csgrandeur.cn/problem/POJ-3233>

Given a $n \times n$ matrix A and a positive integer k , find the sum $S = A + A^2 + A^3 + \dots + A^k$.

Input

The input contains exactly one test case. The first line of input contains three positive integers n ($n \leq 30$), k ($k \leq 10^9$) and m ($m < 10^4$). Then follow n lines each containing n nonnegative integers below 32,768, giving A 's elements in row-major order.

Output

Output the elements of S modulo m in the same way as A is given.

Sample

Input	Output
2 2 4 0 1 1 1	1 2 2 3