Language: Default ⌄

Matrix Power Series

Time Limit: 3000MS   **Memory Limit:** 131072K

Total Submissions: 24399   **Accepted:** 10145

Description

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

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

```
2 2 4
0 1
1 1
```

Sample Output

```
1 2
2 3
```

Source

POJ Monthly--2007.06.03, Huang, Jinsong

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