

# Matrix inverse

Let  $p$  a prime number. A set  $F_p = \{0, 1, \dots, p-1\}$  equipped with the mod  $p$  addition and multiplication is a finite field. In this problem you have to compute the multiplicative inverse of some  $F_p$  valued (quadratic) matrices.

The input consists of blocks. The structure of a block is:

$n$   $p$

$A_{11} \dots A_{1n}$

...

$A_{n1} \dots A_{nn}$

where  $p$  is a prime number,  $1 < n, p < 101$ , and  $A_{ij}$  are in  $F_p$ . The last block followed by 0 0.

The output for each block is either the multiplicative inverse of a given matrix if it exists or the word "singular"

## Example

**Input:**

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

3 7  
3 5 0  
0 5 1  
6 6 6

2 2  
1 1  
1 0

3 5  
4 0 0  
2 4 1  
0 2 3

3 7  
0 1 4  
6 1 2  
2 1 1

0 0

**Output:**

0 1 0 1  
0 0 1 1  
1 1 0 0  
0 0 1 0

6 3 3  
5 1 1  
3 3 2

0 1  
1 1

singular

singular