

## F. Little Artem and 2-SAT

time limit per test: 3 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

Little Artem is a very smart programmer. He knows many different difficult algorithms. Recently he has mastered in 2-SAT one.

In computer science, 2-satisfiability (abbreviated as 2-SAT) is the special case of the problem of determining whether a conjunction (logical AND) of disjunctions (logical OR) have a solution, in which all disjunctions consist of no more than two arguments (variables). For the purpose of this problem we consider only 2-SAT formulas where each disjunction consists of exactly two arguments.

Consider the following 2-SAT problem as an example: . Note that there might be negations in 2-SAT formula (like for  $x_1$  and for  $x_4$ ).

Artem now tries to solve as many problems with 2-SAT as possible. He found a very interesting one, which he can not solve yet. Of course, he asks you to help him.

The problem is: given two 2-SAT formulas  $f$  and  $g$ , determine whether their sets of possible solutions are the same. Otherwise, find any variables assignment  $x$  such that  $f(x) \neq g(x)$ .

### Input

The first line of the input contains three integers  $n$ ,  $m_1$  and  $m_2$  ( $1 \leq n \leq 1000$ ,  $1 \leq m_1, m_2 \leq n^2$ ) — the number of variables, the number of disjunctions in the first formula and the number of disjunctions in the second formula, respectively.

Next  $m_1$  lines contains the description of 2-SAT formula  $f$ . The description consists of exactly  $m_1$  pairs of integers  $x_i$  ( $-n \leq x_i \leq n$ ,  $x_i \neq 0$ ) each on separate line, where  $x_i > 0$  corresponds to the variable without negation, while  $x_i < 0$  corresponds to the variable with negation. Each pair gives a single disjunction. Next  $m_2$  lines contains formula  $g$  in the similar format.

### Output

If both formulas share the same set of solutions, output a single word "SIMILAR" (without quotes). Otherwise output exactly  $n$  integers  $x_i$  () — any set of values  $x$  such that  $f(x) \neq g(x)$ .

### Examples

input
2 1 1 1 2 1 2
output
SIMILAR

  

input
2 1 1 1 2 1 -2
output
0 0

### Note

First sample has two equal formulas, so they are similar by definition.

In second sample if we compute first function with  $x_1 = 0$  and  $x_2 = 0$  we get the result 0, because . But the second formula is 1, because .