# System Solver

#### **Time limit:** 1.0s **Memory limit:** 16M

A system of linear equations is a collection of linear equations involving the same set of variables. A general system of m linear equations with n unknowns can be written as:

$$egin{array}{lll} a_{11}x_1+&a_{12}x_2+\cdots+&a_{1n}x_n=b_1\ a_{21}x_1+&a_{22}x_2+\cdots+&a_{2n}x_n=b_2\ dots&dots&dots\ a_{m1}x_1+a_{m2}x_2+\cdots+&a_{mn}x_n=b_m. \end{array}$$

Here,  $x_1, x_2, \ldots, x_n$  are the unknowns,  $a_{11}, a_{12}, \ldots, a_{mn}$  are the coefficients of the system, and  $b_1, b_2, \ldots, b_m$  are the constant terms. (Source: Wikipedia)

Write a program that solves a system of linear equations with a maximum of 100 equations and variables.

#### **Input Specification**

Line 1 of the input contains integers n and m ( $1 \le n, m \le 100$ ), indicating the number of variables to solve for and the number of equations in the system.

The next m lines will each contain n+1 integers, where the first n integers are the coefficients of the equation and the last integer is the constant term.

Every number in the input is guaranteed to have absolute value at most  $10^6$ .

It is guaranteed that the input is generated randomly. Specifically, for each test case, n and m will be picked arbitrarily, and so will two other integers, l and r. Then, all other values in the input will be integers picked uniformly at random between l and r.

#### **Output Specification**

If the system can be solved, output n lines, the values of the unknowns  $x_1, x_2, \ldots, x_n$ . Your solution will be considered correct if each value has at most  $10^{-5}$  absolute or relative error. If there are no solutions to the system, or if there are infinite solutions to the system, output  $NO \ UNIQUE \ SOLUTION$ .

#### Sample Input 1

2 2

1 3 4

2 3 6

#### **Sample Output 1**

20.66667

### **Explanation for Sample Output 1**

This asks for the solution(s) for x in the system:

$$\begin{cases} x + 3y = 4 \\ 2x + 3y = 6 \end{cases}$$

Solving for x in the first equation gives x=4-3y. Substituting this into the 2-nd equation and simplifying yields 3y=2.

Solving for y yields  $y = \frac{2}{3}$ . Substituting y back into the first equation and solving for x yields x = 2.

Therefore the solution set is the single point  $(x,y)=(2,\frac{2}{3})$ .

#### Sample Input 2

2 3

6 2 2

12 4 8

6 2 4

## **Sample Output 2**

NO UNIQUE SOLUTION

### **Explanation for Sample Output 2**

All of the lines are parallel. Therefore, the system of equations cannot be solved.