

3D

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 512 megabytes

n points a_1, a_2, \dots, a_n are **randomly** generated inside a cube of size 1.

You are given a matrix d with $d_{i,j} = d_{j,i} = \text{dist}(a_i, a_j) + \text{rand}(-0.1..0.1)$ and $d_{i,i} = 0$. Here $\text{dist}(p, q)$ is the distance between points $\sqrt{(p_x - q_x)^2 + (p_y - q_y)^2 + (p_z - q_z)^2}$ and $\text{rand}(-0.1..0.1)$ is a random shift chosen uniformly from interval $[-0.1..0.1]$. Shifts for different pairs of points are chosen independently.

You need to construct a list of points b_1, b_2, \dots, b_n such that $\forall_{i,j} |\text{dist}(b_i, b_j) - d_{i,j}| \leq 0.1$.

Input

The first line contains one integer n ($1 \leq n \leq 10$) — the number of points.

The next n lines contain the description of matrix d . The i -th line contains n real values $d_{i,j}$ ($-0.1 \leq d_{i,j} \leq \sqrt{3} + 0.1$). Each value is given with 6 digits after the decimal point.

It is guaranteed that $d_{i,i} = 0$ and $d_{i,j} = d_{j,i}$.

Output

Print n lines describing the points. i -th line should contain three real numbers $x_i \ y_i \ z_i$ ($-10.0 \leq x_i, y_i, z_i \leq 10.0$).

Example

standard input	standard output
4	0.210269 0.581333 0.000000
0.000000 0.758400 0.557479 0.379026	0.090086 0.000000 0.458722
0.758400 0.000000 0.516608 0.446312	0.000000 0.498388 0.501723
0.557479 0.516608 0.000000 0.554364	0.204618 0.204262 0.075724
0.379026 0.446312 0.554364 0.000000	

Note

This problem has 30 test cases.