Problem H. Tree embedding

Input file:	stdin
Output file:	stdout
Time limit:	1 second
Memory limit:	512 megabytes

bobo has a tree with n vertices. bobo would like to assign an m-dimension vector $\mathbf{p}(v)$ to vertex v, such that for all a, b, $\text{dist}(a, b) = \langle \mathbf{p}(a), \mathbf{p}(b) \rangle$.

Note that $\text{dist}(a, b)$ is the length of the shortest path between vertices a and b. For two vectors $\mathbf{u} = (u_1, u_2, \ldots, u_m)$ and $\mathbf{v} = (v_1, v_2, \ldots, v_m)$, $\langle \mathbf{u}, \mathbf{v} \rangle = \max\{|u_1 - v_1|, |u_2 - v_2|, \ldots, |u_m - v_m|\}$.

Input

The first line contains an integer n ($2 \le n \le 1000$).

Vertices are numbered by $1, 2, \ldots, n$ for convenience.

Each of the following $(n - 1)$ lines contains 3 integers a_i, b_i, c_i, which denotes an edge between vertices a_i and b_i with length c_i ($1 \le a_i, b_i \le n, 1 \le c_i \le 100000$).

Output

The first line contains an integer m, which denotes the dimension of vectors ($1 \le m \le 16$).

Each of the following n lines contains m integers which denotes the vector $\mathbf{p}(i)$. The coordinates should be in $[-10^9, 10^9]$.

Any appropriate solution will get accepted.

Sample input and output

stdin	stdout
2 1 2 2	1 0 -2
4 1 2 1 1 3 1 1 4 1	2 0 0 -1 -1 -1 1 1 1