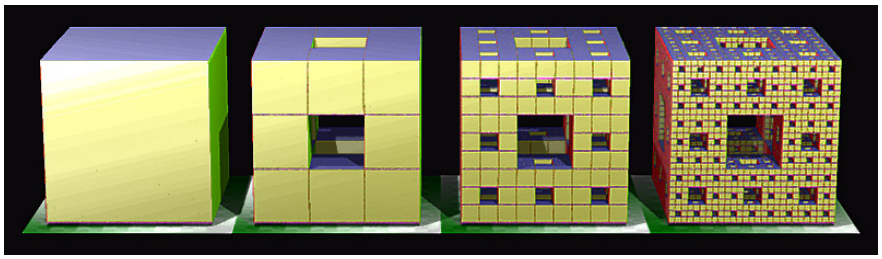
Problem J
Menger Sponge
Time limit: 2 seconds

The Menger sponge is a simple 3D fractal. Its level-L approximation can be constructed with the following algorithm:

> Start with a single solid $1 \times 1 \times 1$ cube with opposite corners at $(0, 0, 0)$ and $(1, 1, 1)$.
> For each iteration $i = 1, \ldots, L$:
>
> > For each cube:
> >
> > > Cut the cube into a regular $3 \times 3 \times 3$ grid of 27 subcubes.
> > > Delete the seven subcubes that don't touch an edge of the parent cube (see illustration).

The points in the level-L Menger sponge are those that remain after running the above algorithm. Points exactly on the boundary of cubes that remain in the sponge **are** part of the sponge.

The picture below shows the result for $L = 0$ through $L = 3$:



Given a level L and a point in space given by three rational coordinates, determine if the point is in the level-L Menger sponge.

Input

The single line of input contains seven integers L, x_{num}, x_{denom}, y_{num}, y_{denom}, z_{num}, z_{denom}:

$$0 \leq L \leq 10^5$$

$$0 < x_{\text{num}} < x_{\text{denom}} \leq 10^6$$

$$0 < y_{\text{num}} < y_{\text{denom}} \leq 10^6$$

$$0 < z_{\text{num}} < z_{\text{denom}} \leq 10^6$$

where L is the level of the Menger Sponge and the point in question is $\left(\frac{x_{\text{num}}}{x_{\text{denom}}}, \frac{y_{\text{num}}}{y_{\text{denom}}}, \frac{z_{\text{num}}}{z_{\text{denom}}}\right)$.

Output

Output a single integer, which is 1 if the point is in the level-L Menger Sponge, or 0 if not.

Sample Input 1	Sample Output 1
1000 1 3 1 3 1 3	1

Sample Input 2	Sample Output 2
2 49 81 5 6 20 81	1

Sample Input 3	Sample Output 3
3 49 81 5 6 20 81	0