

K2 – Gears

A set of gears is installed on the plane. You are given the center coordinate and radius of each gear. For a given input and output gear, indicate what happens to the output gear if you attempt to rotate the input gear.

Input

The first line of input contains a single positive integer n ($2 \leq n \leq 1,000$), the total number of gears. Following this will be n lines, one per gear, containing three space-separated integers x_i , y_i , and r_i ($-10^4 \leq x_i, y_i \leq 10^4, 1 \leq r_i \leq 10^4$), indicating the center coordinate and the radius of the i th gear. Assume the tooth count for each gear is sufficiently high that the gears always mesh correctly. It is guaranteed that the gears do not overlap with each other. The input gear is the first gear in the list, and the output gear is the last gear in the list.

Output

If the input gear cannot move, print, on a single line, “The input gear cannot move.” (without the quotation marks).

If the input gear can move but is not connected to the output gear, print, on a single line, “The input gear is not connected to the output gear.” (without the quotation marks).

Otherwise, print, on a single line, the ratio the output gear rotates with respect to the input gear in the form of “##:##” (without the quotation marks), in reduced form. If the output gear rotates in the opposite direction as the input gear, write the ratio as a negative ratio. For example, if the output gear rotates clockwise three times as the input gear rotates counterclockwise twice, the output should be $-3 : 2$.

Input and output samples

Input:	Output:
2	-1:1
0 0 100	
200 0 100	

Input:	Output:
3	1:1
0 0 100	
200 0 100	
400 0 100	

Input:	Output:
16	1:1
10 10 5	
20 10 5	
30 10 5	
40 10 5	
10 20 5	
20 20 5	
30 20 5	
40 20 5	
10 30 5	
20 30 5	
30 30 5	
40 30 5	
10 40 5	
20 40 5	
30 40 5	
40 40 5	

Input:	Output:
3	The input gear cannot move.
0 0 1	
0 3 2	
4 0 3	