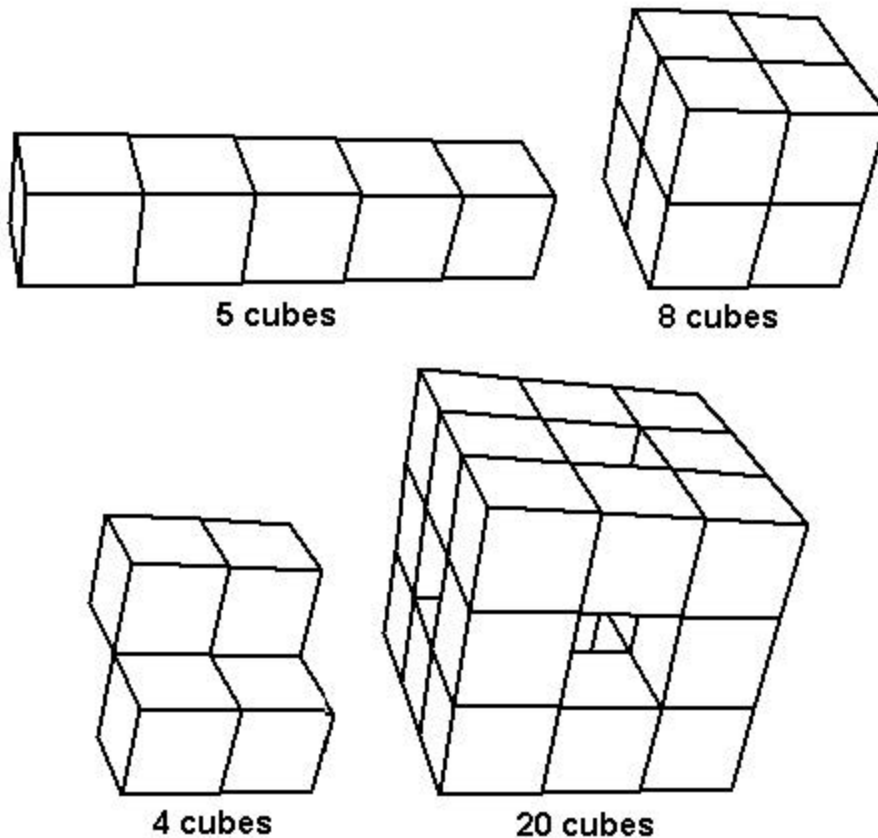# G · Area of Polycubes

A *polycube* is a solid made by gluing together unit cubes (one unit on each edge) on one or more faces. The figure in the lower-left is *not* a *polycube* because some cubes are attached along an edge.

5 cubes

8 cubes

4 cubes

20 cubes

For this problem, the *polycube* will be formed from unit cubes centered at integer lattice points in 3-space. The *polycube* will be built up one cube at a time, starting with a cube centered at (**0,0,0**). At each step of the process (after the first cube), the next cube must have a face in common with a cube previously included and not be the same as a block previously included. For example, a 1-by-1-by-5 block (as shown above in the upper-left *polycube)* could be built up as:

(**0,0,0**) (**0,0,1**) (**0,0,2**) (**0,0,3**) (**0,0,4**)

and a 2-by-2-by-2 cube (upper-right figure) could be built as:

(**0,0,0**) (**0,0,1**) (**0,1,1**) (**0,1, 0**) (**1,0,0**) (**1,0,1**) (**1,1,1**) (**1,1, 0**)

Since the surface of the *polycube* is made up of unit squares, its area is an integer.

Write a program which takes as input a sequence of integer lattice points in 3-space and determines whether is correctly forms a *polycube* and, if so, what the surface area of the *polycube* is.

Input

The first line of input contains a single integer N, $(1 \le N \le 1000)$ which is the number of data sets that follow. Each data set consists of multiple lines of input. The first line contains the number of points P, $(1 = P = 100)$ in the problem instance. Each succeeding line contains the centers of the cubes, eight to a line (except possibly for the last line). Each center is given as 3 integers, separated by commas. The points are separated by a single space.

Output

For each data set, you should generate one line of output with the following values: The data set number as a decimal integer (start counting at one), a space and the surface area of the *polycube* if it is correctly formed, OR, if it is not correctly formed, the string "NO" a space and the index (starting with 1) of the *first* cube which does not share a face with a previous cube. Note that the surface area includes the area of any included holes.

Sample Input	Sample Output
4	1 22
5	2 24
0,0,0 0,0,1 0,0,2 0,0,3 0,0,4	3 NO 3
8	4 72
0,0,0 0,0,1 0,1,0 0,1,1 1,0,0 1,0,1 1,1,0 1,1,1	
4	
0,0,0 0,0,1 1,1,0 1,1,1	
20	
0,0,0 0,0,1 0,0,2 0,1,2 0,2,2 0,2,1 0,2,0 0,1,0	
1,0,0 2,0,0 1,0,2 2,0,2 1,2,2 2,2,2 1,2,0 2,2,0	
2,1,0 2,1,2 2,0,1 2,2,1	