

I: Intruder Alert

A team of secret agents have been seated for a top-secret briefing. The rows of chairs are staggered so that attendees can easily interact with the two in front, the two in back and the one on either side, assuming the attendee is not along the edge, but notably not the one straight ahead or back two rows. We will refer to these potentially six adjacent persons in this honeycomb cell-like arrangement as neighbors of the secret agent in the middle of the cell. Furthermore the rows are arranged such that the chairs on the outside form a convex hull with no gaps. The only allowed angles of the sides of the hull allowed by this geometry are then 0, 45, and 135 degrees. All the chairs are filled. See example below.

Unfortunately there is an intruder. No one really knows anyone else yet, and each has to depend on whom his/her neighbors claim to be. The intruder must lie about his/her identity, claiming to be one of the secret agents on the attendance roll. He/she uses the same false alias when conversing with any of the neighbors. Your task is to root out the intruder, or at least the name of the secret agent he/she is claiming to be.

It was detected that there is one more person than there were invitees, so the organizers had each supposed agent, as he/she left in random order after the meeting, list the up to 6 neighbors. Unfortunately, they did not think to ask the agent's own name, because if they had, they would have quickly been able to narrow the intruder down to the two persons with the same name.

Input

Input may consist of multiple cases. The first line of a case contains a positive integer n , less than 100, representing the number of invited secret agents. Each of the following $n + 1$ lines contains the report of an agent or the imposter. The number of rows may range from 1 to $n + 1$. The report consists of six numbers, representing each neighboring secret agent's claimed identity, such as 007, in clockwise order of seating starting at the 3:00 position. A designation of 000 indicates no neighbor, which only happens if the agent is seated along the edge. Spaces delimit the numbers. It is the value of the number that is significant, eg. 007 and 07 would indicate the same agent. The numeric values of the agent designations range from 1 to n . The last case is followed by a line containing the number 0 (zero). The reports are listed in arbitrary order, as described by the scenario above, without regard to seating order.

Output

For each case, display the case number followed by the claimed identity, formatted as in the sample with 3 digits. If it is impossible to identify the claimed name of the intruder, print the message "sorry". Use single spaces as delimiters.

Sample Input

13
000 03 02 0 0 0
003 005 04 00 00 001
00 06 05 02 1 00
5 8 7 0 0 2
6 9 8 4 2 3
0 010 09 5 3 00
8 12 11 00 00 04
09 013 12 007 04 05
10 11 13 08 05 6
0 0 11 009 06 0
11 0 0 0 0 007
13 0 0 011 7 8
11 0 0 12 8 9
00 00 00 13 9 10
0

Sample Output

Case 1: 011

Example			Not Valid		
0			0		
row 1	45	X X X X X X X		X X X X	
row 2		X X N N X X X		X X X	
row 3		X X N P N X X 45	90	X X X X 90	
row 4	135	X X N N X X		X X X	
row 5		X X X X X		X X X X	
0			0		

The six N's represent the neighbors of agent P. Angles are shown in degrees.