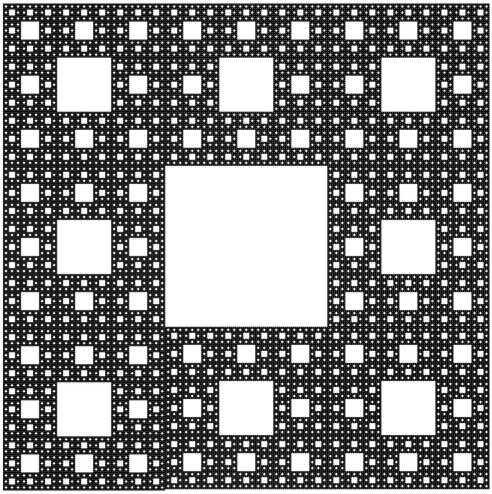
The Sierpinski carpet is a typical plane fractal. The construction of it begins with a square. The square is cut into 9 congruent subsquares in a 3-by-3 grid, and the central subsquare is removed. The same procedure is then applied recursively to the remaining 8 subsquares, ad infinitum.

Let's call the first figure (single square) from which we begin carpet construction S_0, next figure (combined 8 squares) S_1, S_2 figure is combined of 64 squares and so on.

Here is an example of full Sierpinski carpet (S_∞):



In this problem you will be given a point in the plain and you have to find the maximal figure S_N to which this point still belongs.

Input

The number of tests T ($T \le 100$) is given on the first line. Each of next T lines contains two floating point numbers cordinates X ($0 < X < 1$) and Y ($0 < Y < 1$) of a given point. Point's cordinates are given with maximal precision of 6 digits after decimal point.

Output

For each test case output a single line '`Case` T`:` N'. Where T is the test case number (starting from 1) and N is the maximal index of figure S that point still belongs to. If point is in Sierpinski Carpet itself (S_∞) then N must be equal to '`-1`'.

Sample Input

```
2
0.111 0.111
0.123 0.123
```

Sample Output

```
Case 1: 10
Case 2: 1
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