

C - The Closest Pair Problem

Source file name: pair.py

Time limit: 1 second

Given a set of points in a two dimensional space, you will have to find the distance between the closest two points.

Input

The input contains several sets of input. Each set of input starts with an integer N ($0 \leq N \leq 10\,000$), which denotes the number of points in this set. The next N line contains the coordinates of N two-dimensional points. The first of the two numbers denotes the x -coordinate and the latter denotes the y -coordinate. The input is terminated by a set whose $N = 0$ and should not be processed. The value of the coordinates will be less than 40 000 and non-negative.

The input must be read from standard input.

Output

For each set of input produce a single line of output containing a floating point number (rounded up to four decimals after the decimal point), denoting the distance between the closest two points. If there is no such two points in the input whose distance is less than 10 000, print the line 'INFINITY'.

The output must be written to standard output.

Sample Input	Sample Output
3 0 0 10000 10000 20000 20000 5 0 2 6 67 43 71 39 107 189 140 0	INFINITY 36.2215