URI Online Judge | 1295

The Closest Pair Problem

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Timelimit: 2

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 file contains several sets of input. Each set of input starts with an integer **N** (0 ≤ **N** ≤ 10000), which denotes the number of points in this set. The next **N** lines contain 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. This set should not be processed. The value of the coordinates will be less than 40000 and non-negative.

Output

For each set of input produce a single line of output containing a floating point number (with four digits after the decimal point) which denotes the distance between the closest two points. If there is no such two points in the input whose distance is less than **10000**, print the line **INFINITY**.

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

"Generally, a brute force method has only two kinds of reply, a) Accepted b) Time Limit Exceeded."
Adapted by Neilor.