534 Frogger

Freddy Frog is sitting on a stone in the middle of a lake. Suddenly he notices Fiona Frog who is sitting on another stone. He plans to visit her, but since the water is dirty and full of tourists' sunscreen, he wants to avoid swimming and instead reach her by jumping.

Unfortunately Fiona's stone is out of his jump range. Therefore Freddy considers to use other stones as intermediate stops and reach her by a sequence of several small jumps.

To execute a given sequence of jumps, a frog's jump range obviously must be at least as long as the longest jump occuring in the sequence.

The *frog distance* (humans also call it *minimax distance*) between two stones therefore is defined as the minimum necessary jump range over all possible paths between the two stones.

You are given the coordinates of Freddy's stone, Fiona's stone and all other stones in the lake. Your job is to compute the frog distance between Freddy's and Fiona's stone.

Input Specification

The input file will contain one or more test cases. The first line of each test case will contain the number of stones n ($2 \leq n \leq 200$). The next n lines each contain two integers x_i, y_i ($0 \leq x_i, y_i \leq 1000$) representing the coordinates of stone $\#i$. Stone #1 is Freddy's stone, stone #2 is Fiona's stone, the other $n-2$ stones are unoccupied. There's a blank line following each test case. Input is terminated by a value of zero (0) for n.

Output Specification

For each test case, print a line saying "`Scenario #`x" and a line saying "`Frog Distance = `y" where x is replaced by the test case number (they are numbered from 1) and y is replaced by the appropriate real number, printed to three decimals. Put a blank line after each test case, even after the last one.

Sample Input

```
2
0 0
3 4
3
17 4
19 4
18 5
0
```

Sample Output

```
Scenario #1
Frog Distance = 5.000

Scenario #2
Frog Distance = 1.414
```