Gopher Strategy

Agent Cooper: *"Look at that! Ducks... on the lake!"*
Harley Peyton, "Twin Peaks."

Gophers like to feed in the field, but they always have to look out for hawks that might hunt them. A group of gophers have decided to get more organized and need your help developing an escape strategy in case of a hawk attack.

Given the coordinates of **m** gophers and **n** holes in the field, what is the minimum time required for each gopher to reach a hole (at most one gopher per hole)? Every gopher runs in a straight line at a speed of 1 unit per second, and the group can tolerate the loss of at most **k** gophers. (Gophers are lost when they do not have enough time to reach an empty hole.)

Input

The first line of input gives the number of cases, **N**. **N** test cases follow. Each one starts with a line containing the integers **m**, **n** and **k** (0 <= **m**, **n** <= 50, 0 <= **k** <= **m**). The next **m** lines will give the x,y-coordinates of the gophers. The **n** lines after that will give the coordinates of the holes. All coordinates are integer numbers between -1000 and 1000.

Output

For each test case, output the line "Case #**x**:", where **x** is the number of the test case. Then print the minimal time required for at least **m**-**k** gophers to reach a hole, with exactly 3 decimal places. Please note the given time should be large enough for them to escape, e.g., always round *up* if rounding is necessary.
Print "Too bad." if there is no solution. Print an empty line after each test case.

Sample Input	Sample Output
4 3 3 1 0 0 1 0 2 0 0 1 1 1 2 2 3 3 1 0 1 1 2 2 1 1 0 1 1 2 0 3 3 0 0 1 1 2 2 1 1 0 1 1 2 0 1 0 0 102 205	Case #1: 1.000 Case #2: 1.000 Case #3: 1.415 Case #4: Too bad.

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Alternate solutions: Yury Kholondyrev, Bartholomew Furrow