Browse

Elly and her herd of sheep are in trouble again. After a long day of browsing it is time to bring them into the barns in order to be safe for the night. The size of the barns is limited – each barn can accommodate at most **K** sheep. Some of the barns might remain not entirely full; they can even remain completely empty. It is only important that each sheep is in a barn.
For simplicity the sheep can be represented as **N** points and the barns as **M** points with integer coordinates on the plane. It is possible that several sheep, several barns or several sheep and barns share the same coordinates.
Elly's sheep walk a unit of distance per second. Thus, if for example one of them is at position (0, 0) and wants to go to a barn at (1, 3) it will need approximately 3.16227766 seconds. If the barn was at coordinates (3, 4) instead, the animal would need exactly 5 seconds.
Help Elly by calculating what is the minimal time needed in order all sheep to get into barns. The sheep can move simultaneously and you can assume that they do not disturb each-other's movement.

Input
On the first line of the standard input will be given three integers **N**, **M** and **K** – the number of sheep, the number of barns, and the maximal number of sheep in a barn, respectively. On each of the next **N** lines will be given a pair of integers, giving the coordinates of the sheep. Then follow **M** lines, each containing a coordinate of a barn.

Output
On a single line of the standard output print one real number, rounded to exactly 6 digits after the decimal point – the minimal time needed for all sheep to get into barns, in such way that each barn contains **K** or less sheep. The test data guarantees that this will be always possible (i.e. **N** ≤ **M** * **K**).

Constraints
- 1 ≤ **N**, **M**, **K** ≤ 500
- -1000 ≤ **X**, **Y** ≤ 1000
- In 50% of the cases **N**, **M** and **K** will be less than or equal to 15.

Sample Input	*Sample Output*	*Clarification*
5 3 2 2 13 9 6 4 8 13 7 11 3 2 11 10 6 4 12	7.810250	*One of the optimal answers is achieved if the sheep with coordinates (2, 13) and (4, 8) go to the barn at (2, 11); the sheep at (9, 6) go to (4, 12) and (11, 3) with (13, 7) go to (10, 6). Note that we would have a better answer if the sheep at (9, 6) also goes to (10, 6), however the barn would give shelter to 3 sheep, when 2 is its limit. The time to go from (9, 6) to (4, 12) is largest of all and is rounded to 7.810250.*