Problem F
Messenger
Time Limit: 4 seconds

Misha needs to send packages to his friend Nadia. Both of them often travel across Russia, which is very large. So they decide to hire a messenger. Since the cost of the messenger service depends on the time it takes to deliver the package, they need your help to optimize a little bit.

Assume Misha and Nadia move on a two-dimensional plane, each visiting a sequence of places and moving along straight line segments from place to place. Your task is to find the shortest possible delivery time given their two paths.

Misha hands the package to the messenger at some point along his path. The messenger moves without delay along a straight line from the pick-up to intercept Nadia, who is traveling along her path. Misha, Nadia and the messenger move with a constant speed of 1 distance unit per time unit. The delivery time is the time between Misha handing over the package and Nadia receiving it.

Input

The input consists of a single test case. The test case contains two path descriptions, the first for Misha and the second for Nadia. Each path description starts with a line containing an integer n, the number of places visited ($2 \le n \le 50\,000$). This is followed by n lines, each with two integers x_i and y_i specifying the coordinates of a place ($0 \le x_i, y_i \le 30\,000$). Coordinates of the places are listed in the order in which they are to be visited, and successive places do not have the same coordinates.

Misha and Nadia start their journeys at the same time, visiting the places along their paths without stopping. The length of each path is at most 10^6. The package must be picked up at the latest when Misha reaches his final place and it must be delivered at the latest when Nadia reaches her final place.

Output

Display the minimal time needed for delivery. Give the answer with an absolute error of at most 10^{-3} or a relative error of at most 10^{-5}. If the package cannot be delivered, display `impossible` instead.

Sample Input 1	Sample Output 1
2 0 0 0 10 2 4 10 4 0	4.00000

Sample Input 2	Sample Output 2
2 0 0 1 0 3 2 0 3 0 3 10	5.00000