

In a distant land far away from the UOM, two countries engage in a brutal war over a highly valued piece of land. One of the armies is camping in a vast forest filled with dense woods. Skilled **N** spies, known for their expertise, have uncovered information about an impending guerrilla attack by the opposing country. These spies are scattered throughout the forest, hiding in various locations. Additionally, there are **M** camps built in different areas of the forest, also scattered about.

There is a pressing need to alert the army camps in the forest about an upcoming attack. The attack poses a serious threat to the army, and it is imperative that the camps are notified promptly. Unfortunately, we can only use **K** number of spies to convey the message to a **K** number of camps. To ensure that the army is well-prepared for the upcoming guerrilla attack, we need to minimize the delivery time of the message. This will enable the camps to save their soldiers and protect their base. All the army camps have the same number of soldiers, so there is no priority difference between them.

You are given the coordinates of these army camps as well as the coordinates of the spies throughout the forest and **K** number of camps that need to be notified about the upcoming attack. You need to calculate the square of the minimum time the **K** camps notified about the attack. Also note that each spy can only notify a single army camp.

Input Format

The first line contains the three integers **N**, **M**, **K** separated by a single whitespace. The following **N** lines contain **N** pairs of integers denoting the coordinates of the **N** spies. Each pair of integers separated by single white space. The next **M** lines contains the coordinates of the **M** army camp scattered though the forest in the similar way. The **K** denotes the number of camps that need to be notified

Constraints

- $1 \leq N \leq 250$
- $1 \leq M \leq 250$
- $1 \leq K \leq \min(N, M)$
- $0 \leq x_i, y_i \leq 10^7$

Output Format

A single line contains the square of the minimum time.

Note: time can be calculated as the distance between the coordinates of the spy and the appropriate camp.

Sample Input 0

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4 4 2
250 56
131 805
69 820
439 476
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441 471
120 638
761 594
909 548

Sample Output 0

28010