C. Watering Flowers

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

A flowerbed has many flowers and two fountains.

You can adjust the water pressure and set any values $r_1(r_1 \geq 0)$ and $r_2(r_2 \geq 0)$, giving the distances at which the water is spread from the first and second fountain respectively. You have to set such r_1 and r_2 that all the flowers are watered, that is, for each flower, the distance between the flower and the first fountain doesn't exceed r_1, or the distance to the second fountain doesn't exceed r_2. It's OK if some flowers are watered by both fountains.

You need to decrease the amount of water you need, that is set such r_1 and r_2 that all the flowers are watered and the ${r_1}^2 + {r_2}^2$ is minimum possible. Find this minimum value.

Input

The first line of the input contains integers n, x_1, y_1, x_2, y_2 ($1 \leq n \leq 2000$, $-10^7 \leq x_1, y_1, x_2, y_2 \leq 10^7$) — the number of flowers, the coordinates of the first and the second fountain.

Next follow n lines. The i-th of these lines contains integers x_i and y_i ($-10^7 \leq x_i, y_i \leq 10^7$) — the coordinates of the i-th flower.

It is guaranteed that all $n + 2$ points in the input are distinct.

Output

Print the minimum possible value ${r_1}^2 + {r_2}^2$. Note, that in this problem optimal answer is always integer.

Examples

input
2 -1 0 5 3 0 2 5 2

output
6

input
4 0 0 5 0 9 4 8 3 -1 0 1 4

output
33

Note

The first sample is (${r_1}^2 = 5$, ${r_2}^2 = 1$): The second sample is (${r_1}^2 = 1$, ${r_2}^2 = 32$):