

Alignment

Time Limit: 1 Second
Memory Limit: 2048 MB

LetianPie is very passionate about astronomy. He often takes photos of the sky at night to record the location of the stars and monitor how the position differs over time. He now has two pictures A and B of the sky taken at two different times and wants to align them together so that he can observe how the placement of the stars changes. LetianPie can move the photo A (but not rotate it) and he wants the overlapping between the two images maximized. More formally, he wants the maximum distance between any star in photo A and any star in photo B to be minimized. However, LetianPie is so busy with his CS 425 MPs, so he asks you for help.

Input

The first line of input contains a single integer n ($1 \leq n \leq 10^5$) - number of stars in photo A .

For the next n lines, each line contains two integers x_i, y_i ($|x_i|, |y_i| \leq 10^6$) - the location of the i -th star in photo A . It is guaranteed that the locations are distinct.

The next line of input contains a single integer m ($1 \leq m \leq 10^5$) - number of stars in photo B .

For the next m lines, each line contains two integers x_i, y_i ($|x_i|, |y_i| \leq 10^6$) - the location of the i -th star in photo B . It is guaranteed that the locations are distinct.

Output

Output three numbers: d , v_x , and v_y , separated by space, representing the minimum distance required, as well as how much the new photo should be translated in order to obtain this minimum distance. Your answer will be accepted if it has an absolute or relative error within 10^{-6} .

Sample Inputs

```
3
1 5
2 4
6 8
2
1 3
1 6
```

Sample Outputs

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4.03112887415 -3 -1.5
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