Problem J - Squirrels

Time Limit: 10 sec

One day, a curious squirrel took a trip to Unknown Island of Unrest and Chaos (UIUC). He found out that there was great grassland on UIUC, and he would like to lie down on the grass and enjoy the sunshine.

But there is one problem. Several other squirrels had already occupied some pieces of land. The curious squirrel didn't want to bother them, so he would like to find a place which is furthest from all the other squirrels. Unfortunately, this curious squirrel didn't know how to find such a place, so he turned to your help.

Assume the grassland is on a 2-D plane. The southwest corner is at (0, 0), and the northeast one is at (X, Y). There are **N** squirrels (other than the curious one) on this grassland, and the i-th squirrel stays at (x_i, y_i). You are asked to find a point (x, y) to maximize the Manhattan distance from this point to the nearest squirrel.

The Manhattan distance of two points (x_i, y_i) and (x_j, y_j) is defined as $|x_i - x_j| + |y_i - y_j|$.

Input

The first line of input gives the number of test cases, **T**. **T** test cases follow. There could be zero or more blank lines preceding any test case.

Each case begins with a line containing three integers, **X**, **Y** and **N**. The next **N** lines give the x and y coordinates of the squirrels. No two squirrels would occupy the same place.

Output

Output consists of a single line for each test case, giving the maximum distance with four digits after the decimal point.

Constraints

- $\mathbf{T} \leq 50$
- $1 \leq \mathbf{X}, \mathbf{Y} \leq 10^6$
- $1 \leq \mathbf{N} \leq 1000$
- $0 \leq \mathbf{x_i} \leq \mathbf{X}, 0 \leq \mathbf{y_i} \leq \mathbf{Y}$

Sample Input

```
2
10 10 4
2.0 2.0
8.0 2.0
2.0 8.0
```

```
8.0 8.0
5 5 7
4.5 4.5
1.5 3.5
4.0 2.0
0.5 1.0
2.5 0.5
5.0 0.0
0.0 5.0
```

Sample Output

```
6.0000
2.5000
```