

Problem TVSTATION2: TV station broadcasting II

Our problem is where to locate our TV station's broadcasting tower. We know the locations of the towns we should serve. Fortunately, we are located on the flat, flat prairie, so the only issue is where to locate the tower to minimize the broadcast radius that includes all the towns. We know the locations of the towns we should serve. The tower's location is **NOT** restricted to integer coordinates.

Input

The first line gives the number of test cases. Each test case contains two lines. The first line gives the x-coordinates of the towns, the second line gives the y-coordinates of the towns; the i -th element of x and y gives the coordinates of the i -th town. There are at most 50 towns, each coordinate is integer between -1000 and 1000 (inclusive).

Output

For each test case, print the minimal radius (rounded to four digits) in one line.

Sample Input 1

```
3
1 0 -1 0
0 1 0 -1
```

```
3
299
```

```
5 3 -4 2
0 4 3 2
```

Sample Output 1

```
1.0000
0.0000
4.7434
```