6784 Step by Step

Bob wants to climb a mountain. The terrain is rough, however, so he can only place his feet in certain positions without falling down. Moreover Bob can move each of his feet only a certain distance from the other. Find out whether Bob can reach the summit.

Positions are given as three-dimensional Cartesian coordinates. Initially Bob's feet occupy two given positions. In each step he can move either his left foot or his right foot. While moving his left foot, his right foot stays fixed. The new position of the left foot must satisfy three criteria:

- It must differ from the position of the right foot in its x- or y-coordinate, or both.
- It must be at most a certain distance d away from the position of the right foot; the value of d depends on Bob's anatomy.
- It must not cross over the right foot. To be precise, let P be the plane that contains the position of the right foot and is perpendicular to the line between the position of the right foot and the point which has the x- and y-coordinates of the old position of the left foot and the z-coordinate (height) of the position of the right foot. Then the new position of the left foot must be on P or on the side of P that contains the old position of the left foot.

The constraints for moving the right foot are symmetrical: swap left and right in the above description. Bob needs to perform a sequence of such steps to put his feet into given target positions. Your task is to find the smallest distance d for which this is possible.

Input

The first line of the input contains an integer t specifying the number of test cases. Each test case starts with a line containing an integer n that specifies the number of positions on which Bob can place a foot during his climb ($4 \leq n \leq 100$).

Each of the following n lines contains the three integer coordinates x, y and z of a position ($-10^6 \leq x, y, z \leq 10^6$); the z-coordinate is its height. The first position is the initial position of Bob's left foot; the second is the initial position of his right foot. The next-to-last position is the target position of his left foot; the last is the target of his right foot.

Positions in a test case are distinct.

Output

For each test case, display the smallest integer that is greater than or equal to the smallest distance d for which Bob can reach the target positions. Note that d is at least as large as the distance between the initial positions of Bob's feet. Display '`impossible`' (without the quotes) if Bob cannot reach the target positions.

Sample Input

```
3
4
1 0 0
2 0 0
3 1 0
```

```
0 1 0
4
100 0 0
200 0 0
0 100 0
300 100 0
4
100 0 0
200 0 0
100 100 0
200 100 0
```

Sample Output

```
impossible
300
142
```