# I Collision of Bacteria

An experiment is being conducted to find out how different colonies of bacteria behave when they collide with each other. The individual colonies are placed on a large dish and the dish can be modeled in a **2D** plane. Initially, each colony occupies a rectangular area (sides parallel to axis) and the sizes of these colonies grow with time. The growth of the colonies occurs in the following manner:
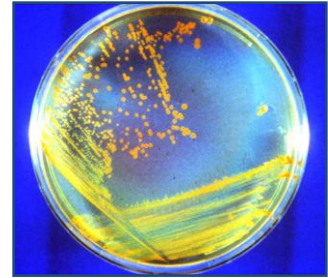
1. The **x** and **y** coordinate of the lower-left corner decrease.
2. The **x** coordinate of lower-right corner increases and the **y** coordinate decreases.
3. The **x** and **y** coordinate of upper-right corner increase.
4. The **x** coordinate of upper-left corner decreases and the **y** coordinate increases.

All the increments/decrements mentioned above occur at a constant rate **r** with respect to time. In this problem, you have to determine the smallest unit of time that elapses when there are at least two colonies that are not more than **d** distance apart. Here the distance refers to the shortest Euclidean distance between the rectangular areas occupied by the colonies.

Input

The first line of input will contain **T (≤ 100)** denoting the number of cases.

Each case starts with an integer **n (2 ≤ n ≤ 50)** denoting the number of colonies. Each of the next **n** lines contains 4 integers x_1 y_1 x_2 y_2 $(0 ≤ x_1, y_1, x_2, y_2 ≤ 10000, x_1 < x_2, y_1 < y_2)$ where (x_1, y_1) and (x_2, y_2) denote the lower-left and upper-right corner of the colony respectively. Next line contains two integers, **r** and **d (1 ≤ r, d ≤ 50)**.

Output

For each case, print the case number and the desired result rounded to **3** places after the decimal point. If two colonies overlap or just touch each other, they are considered to be zero distance apart.

Sample Input	Output for Sample Input
2 2 0 0 1 1 3 0 4 1 1 1 2 0 0 1 1 0 1 3 2 1 1	Case 1: 0.500 Case 2: 0.000