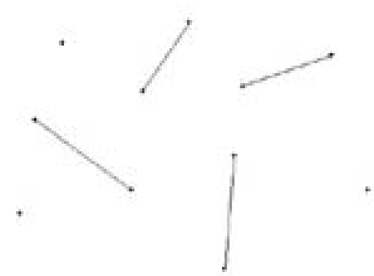
Problem C
Weird Fence
Input: Standard Input
Output: Standard Output

In the land of our great Sultan, the World Weird Fence (WWF) festival is going to take place again. For the festival, some poles are set up in a Cartesian plane. Each pole is colored in either red or blue color. You can connect two poles with a chain that consists of multi-colored rings thus creating a weird fence. Each pole has a single hook so you can not connect more than one chain to a pole. Now, though you have an unlimited supply of chains all having the same length, it's important to note that each of the chains has a red ring at one end & a blue ring at the other end and you are only allowed to hook up a ring to a pole with same color. Also, it's obvious that you can use a chain to connect two poles if & only if the chain's length is greater than or equal to the linear distance of those two poles.



Given the co-ordinates of the poles & a positive integer **k**, write a program to find the minimum possible integer length for the chains so that at least **k** weird fences can be made. The fences may cross each other.

Input

The first line of the input file is the number of test cases **N**. This line will be followed by a blank line. **N** test cases follow. First line of each test case contains two positive integers **P** & **k** where **P** is the number of poles on the plane. (**1<=P,k<=100**). Each of the next **P** lines has two integers **X** & **Y** & the word "**red**" / "**blue**". **X** & **Y** are the co-ordinates of the pole (**-1000<=X,Y<=1000**) & the word is the color of that pole. No two poles will be in the same location. There will be a blank line between test cases.

Output

For each test case output a single integer in a line which is the minimum integer length of the chains that is necessary to make at least **k** fences. If it is not possible to build **k** fences with the given constraints, print the word "**Impossible**" in a single line.

Sample Input	**Sample Output**
2 6 2 -3 5 blue -3 3 red 1 5 blue 2 0 red 4 6 blue 4 -1 red 6 4 -3 5 blue -3 3 red 1 5 blue 2 0 red 4 6 blue 4 -1 red	6 Impossible

Problemsetter: Mohammad Mahmudur Rahman
Special thanks To: Manzurur Rahman Khan