# Candies in Shape

Input file: Problem6.txt

A factory is making candies in the form of squares. However, it is a startup and cannot yet buy high accuracy machine for cutting the candy. So the machine cuts both square and rectangular. The factory then separates the candies which are square and the ones which are rectangular and sell them at different rates. The factory puts a camera above the conveyer belt, which can detect corners of the candies, but cannot determine their shape.

Given integer coordinates of the four corners of a candy: $X_1$, $Y_1$, $X_2$, $Y_2$, $X_3$, $Y_3$, $X_4$, $Y_4$. Determine whether these inputs form a rectangle, a square or neither in coordinate plane. Assume that two consecutive inputs form a coordinate point (x, y). If the points form a rectangle or a square then output name of shape with its perimeter.

## Input
The input consists of multiple test cases. The first line is the number of test **cases N (1≤ N ≤5000)**. After that, the next N lines will have 4 coordinates each.

## Output
For each test case in the input, first output "Case #n: " where n is the test case number, followed by the statement: "The points given form a <specify shape> with perimeter m units".

## Sample Input
2
0 0 0 4 4 0 4 4
0 0 4 0 0 2 4 2

## Sample Output
Case #1: The points given form a square with perimeter 16 units
Case #2: The points given form a rectangle with perimeter 12 units