Artillery

Input File: Problem8.txt

Your forces are under attack by the enemy. You are an officer of the army in charge of artillery. To destroy the enemy, you must fire multiple artillery barrage so that the way is clear for your troops to move forward. The enemy's structures are placed on a 2D plane at all grid points – these are the points (x, y) such that both x and y are integers (positive, negative or 0). The artillery barrage can take the shape of triangle, circle or square, and all structures who fall within that shape (including its boundaries) are destroyed. Given the types of artillery barrage and the details regarding where you can call the strikes, output the number of structures of the enemy you have destroyed.

Input

The first line contains the number of test cases T. T test cases follow.

Each case contains an integer N on the first line, denoting the number of artillery strikes. N lines follow, each containing the description of the strike.

If the **i**th strike is a triangle, then the line will be of the form 'T x1 y1 x2 y2 x3 y3'. Here, (x1, y1), (x2, y2) and (x3, y3) are the coordinates of the vertices of the triangle.

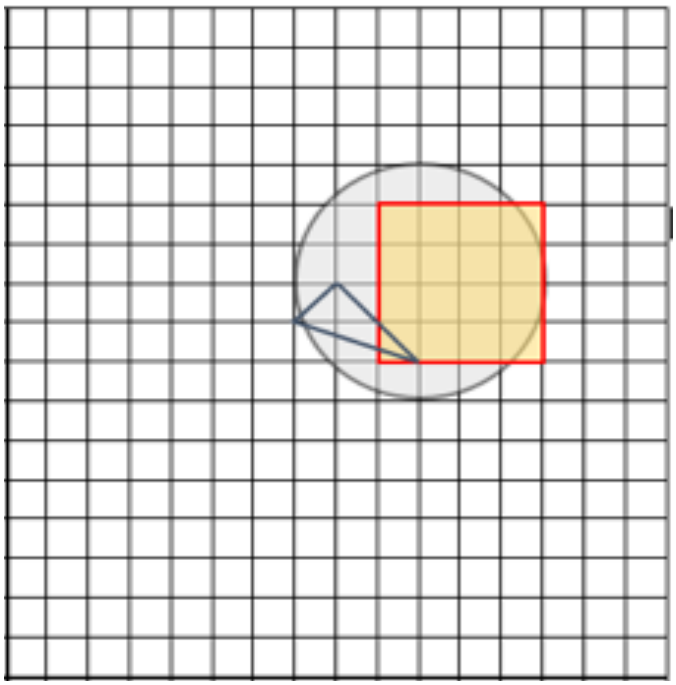
If the **i**th strike is a circle, then the line will be of the form 'C x y r'. Here, (x, y) is the center and r is the radius of the circle.

If the **i**th strike is a square, then the line will be of the form 'S x y l'. Here, (x, y) denotes the coordinates of the bottom-left corner of the square (the corner having the lowest x and y values) and l is the length of each side.

Output

Output T lines, one for each test case,

denoting the number of structures you destroy.



Constraints:

All numbers in the input are integers

between -50 and 50, inclusive.

The areas of all geometric figures

will be > 0. Explanation of Sample

Input: Illustration of Test case 4.

Sample Input

```
4
1
C 5 5 2
1
S 3 3 4

1
T 1 1 1 3 3 1
3
C 10 10 3
S 9 8 4
T 7 9 10 8 8 10
```

Sample Output

```
Case #1: 13

Case #2: 25

Case #3: 6

Case #4: 34
```