

Problem 9

Mobile Phone Coverage

A mobile phone company ACMICPC (Advanced Cellular, Mobile, and Internet-Connected Phone Corporation) is planning to set up a collection of antennas for mobile phones in a city called Maxnorm. The company ACMICPC has several collections for locations of antennas as their candidate plans, and now they want to know which collection is the best choice.

For this purpose, they want to develop a computer program to find the coverage of a collection of antenna locations. Each antenna A_i has power r_i , corresponding to "radius". Usually, the coverage region of the antenna may be modeled as a disk centered at the location of the antenna (x_i, y_i) with radius r_i . However, in this city Maxnorm such a coverage region becomes the square:

$$[x_i - r_i, x_i + r_i] \times [y_i - r_i, y_i + r_i]$$

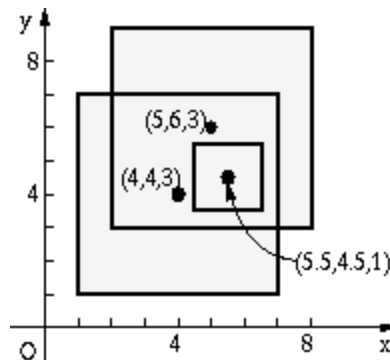
As an example, consider the following collection of 3 antennas

4.0 4.0 3.0

5.0 6.0 3.0

5.5 4.5 1.0

depicted in the following figure:



where the i^{th} row represents x_i, y_i, r_i such that (x_i, y_i) is the position of the i^{th} antenna and r_i is its power. The area of regions of points covered by at least one antenna is 52.00 in this case.

Write a program that finds the area of coverage by a given collection of antenna locations.

Input

The input contains multiple data sets, each representing a collection of antenna locations. The first integer n is the number of antennas, such that $2 \leq n \leq 100$. The coordinate of the i^{th} antenna is given by (x_i, y_i) , and its power is r_i . x_i, y_i and r_i are fractional numbers between 0 and 200 inclusive.

The input contains multiple data sets, each representing a collection of antenna locations. A data set is given in the following format:

$$\begin{array}{ccc}
 n & & \\
 x_1 & y_1 & r_1 \\
 x_2 & y_2 & r_2 \\
 \dots & & \\
 x_n & y_n & r_n
 \end{array}$$

The end of the input is indicated by a data set with 0 as the value of n .

Output

For each data set, your program should output its sequence number (1 for the first data set, 2 for the second, etc.) and the area of the coverage region. The area should be printed with two digits to the right of the decimal point, after rounding it to two decimal places.

Sample input

```
file.txt
```

Sample input file (file.txt)

```

3
4.0 4.0 3.0
5.0 6.0 3.0
5.5 4.5 1.0
2
3.0 3.0 3.0
1.5 1.5 1.0
0

```

Sample output

```

1 52.00
2 36.00

```