PROBLEM F
Radio Transmitters

Congratulations! You've just taken a job as an analyst for KACM radio, a station that broadcasts to a region extending over the square from [−10,−10] to [10,10] inclusive.

KACM has some (one or more) transmitters of varying power, all located at integer coordinates inside the broadcast region. They would like to have their signal strength exceed a constant at every integer coordinate in the zone. The signal strength at a point is just the sum of the signals from all transmitters. This total signal must exceed 100.

The signal at location L from a transmitter T of power P is given by:

```
floor(P / D(L,T)^2)
```

That is, signal degrades quadratically in this world.

Sometimes the signal at all points is above the threshold, but usually it isn't. In such cases, KACM wants to know where to build a single new tower with sufficient (but not excess) power to cover the region. Your job is to determine the integer X,Y location and integer power P such that the signal at all locations within the region exceeds 100.

Note that it is possible to place more than one transmitter at a single location. If such is the case, the power for each transmitter is evaluated separately.

INPUT:
A series of transmitter lists. Each list consists of X Y P integer triples. The end of each list is a "0 0 0" triple, and the series ends with an empty group (i.e., an extra "0 0 0").

The input file is **f.dat**.

OUTPUT:
For each transmitter list, your program is to determine the location of the lowest−powered transmitter that can be added to the grid to provide the needed signal strength at all locations on the grid. If more than one location can be used for such a transmitter, select the location with the smallest X coordinate. If more than one location exists with the same X coordinate, select the location with the smallest Y coordinate. Print a line indicating the transmitter power required and selected location using a format similar to that of the sample output. If every location on the grid already receives a signal of adequate strength, print the message "No additional transmitters needed" on a separate line.

Sample INPUT:

```
0 0 20000
0 0 0
0 0 10000
0 0 0
5 5 5000
-5 5 5000
0 0 0
7 7 1224
7 -7 1224
-7 7 1224
0 0 0
7 7 2000
7 -7 2000
-7 7 2000
0 0 0
5 2 1000
7 6 3000
-7 5 2000
-10 10 300
10 -10 5000
-10 -10 3000
0 0 0
0 0 0
```

Sample OUTPUT:

```
No additional transmitters needed
Add a power 10000 transmitter at 0,0
Add a power 6900 transmitter at 0,-10
Add a power 9990 transmitter at -3,-3
Add a power 6120 transmitter at -4,-4
Add a power 169 transmitter at -1,3
```

Note:
The sum S at any location is guaranteed to be less than 1,000,000 (we're not going to throw a bunch of high–powered transmitters at you and watch your program overflow).