

Problem J:
Dance (a.k.a The Circles of Evil)

Source file: dance.{c | cpp | java}

Input file: dance.in

In an effort to preserve energy, a new dance floor has been designed with a layer of energy sensors underneath it. The purpose of the new design is to use the weights and movements of the dancers to store energy in batteries that are connected to the sensors. The sensors can collect energy from dancers within a circle of a specific radius.

In this problem, you will be given the locations of the energy sensors and the locations of the dancers on the dance floor. If the dancer is within the range of only one energy sensor, he or she contributes an energy value calculated as $K \times Ei$ where K is a constant for the dance floor, and Ei is the expected energy factor for dancer i . If the dancer is within the range of more than one sensor, the energy contribution for each sensor is calculated as $\frac{K \times Ei}{N}$ where N is the number of energy sensors dancer i is in the range of. Your task is to calculate the total energy contribution of all dancers on the dance floor.

Input

The first line of the input file contains an integer N indicating the number of test cases. The first line of each test case contains three integers D , S , and K ($0 < D, S, K \leq 1,000$) where D and S represent the number of dancers and sensors, respectively, and K is a constant as described above. D lines follow with three integers each. The first two integers represent the X and Y coordinates of a dancer, and the third integer is the expected energy factor of the dancer E ($0 < E \leq 10,000$). S lines follow with three integers each. The first two integers represent the X and Y coordinates of a sensor, and the third integer is the range of the sensor R ($0 < R \leq 1,000$). All X and Y coordinates have an absolute maximum of 10^8 . Multiple dancers can be located in the same coordinates, and also multiple sensors can be in the same coordinates.

Output

The output for each test case is in this form:

k. E

where k represents the test case number (starting at 1) followed by a single space, and E is the total energy contribution with an accuracy of two decimal points.

Sample Input

```
2
3 3 10
1 1 10
1 -2 10
5 5 10
0 1 2
0 -2 2
-5 -5 2
2 2 10
1 1 10
-1 -1 10
0 0 5
0 1 5
```

Output for Sample Input

```
1. 200.00
2. 200.00
```