Kick Start 2017 - Round B

Center

Problem

There are **N** weighted points in a plane. Point **i** is at ($\mathbf{X_i}$, $\mathbf{Y_i}$) and has weight $\mathbf{W_i}$.

In this problem, we need to find a special center of these points. The center is a point (**X**, **Y**) such that the sum of max(|**X**-$\mathbf{X_i}$|, |**Y**-$\mathbf{Y_i}$|)*$\mathbf{W_i}$ is minimum.

Input

The input starts with one line containing exactly one integer **T**, which is the number of test cases. **T** test cases follow.

Each test case begins with one line containing one integer **N**. **N** lines follow. Each line contains three space-separated real numbers $\mathbf{X_i}$, $\mathbf{Y_i}$, and $\mathbf{W_i}$. $\mathbf{X_i}$, $\mathbf{Y_i}$ and $\mathbf{W_i}$ have exactly 2 digits after the decimal point.

Output

For each test case, output one line containing `Case #x: y`, where `x` is the test case number (starting from 1) and `y` is the sum of max(|**X**-$\mathbf{X_i}$|, |**Y**-$\mathbf{Y_i}$|)*$\mathbf{W_i}$ for center (**X**, **Y**).

`y` will be considered correct if it is within an absolute or relative error of 10^{-6} of the correct answer. See the FAQ for an explanation of what that means, and what formats of real numbers we accept.

Limits

1 ≤ **T** ≤ 10.
Memory limit: 1GB.
-1000.00 ≤ $\mathbf{X_i}$ ≤ 1000.00.
-1000.00 ≤ $\mathbf{Y_i}$ ≤ 1000.00.

Small dataset (Test set 1 - Visible)

Time limit: 20 seconds.
1 ≤ **N** ≤ 100;
$\mathbf{W_i}$ = 1.0, for all i.

Large dataset (Test set 2 - Hidden)

Time limit: 40 seconds.
1 ≤ **N** ≤ 10000;
1.0 ≤ $\mathbf{W_i}$ ≤ 1000.0, for all i.

Sample

Sample Input

```
3
2
0.00 0.00 1.00
1.00 0.00 1.00
4
1.00 1.00 1.00
1.00 -1.00 1.00
-1.00 1.00 1.00
-1.00 -1.00 1.00
2
0.00 0.00 1.00
1.00 0.00 2.00
```

Sample Output

```
Case #1: 1.0
Case #2: 4.0
Case #3: 1.0
```