code jam
System.out.println("hello, world!");

Practice Mode

Round 1C 2009

- Submissions

All Your Base

8pt	Not attempted **2176/2473 users** correct (88%)
15pt	Not attempted **1441/2203 users** correct (65%)

Center of Mass

10pt	Not attempted **823/1428 users** correct (58%)
17pt	Not attempted **737/913 users** correct (81%)

Bribe the Prisoners

15pt	Not attempted **1061/1579 users** correct (67%)
35pt	Not attempted **302/735 users** correct (41%)

- Top Scores

tikitikirevenge	100
Progbeat	100
Zeroline	100
maojm	100
WSX	100
Onufry	100
Imba	100
ZhukovDmitry	100
Al.Cash	100
Ostap	100

Problem B. Center of Mass

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the Quick-Start Guide to get started.

Small input 10 points	Solve B-small
Large input 17 points	Solve B-large

Problem

You are studying a swarm of **N** fireflies. Each firefly is moving in a straight line at a constant speed. You are standing at the center of the universe, at position (0, 0, 0). Each firefly has the same mass, and you want to know how close the center of the swarm will get to your location (the origin).

You know the position and velocity of each firefly at t = 0, and are only interested in t ≥ 0. The fireflies have constant velocity, and may pass freely through all of space, including each other and you. Let M(t) be the location of the center of mass of the **N** fireflies at time t. Let d(t) be the distance between your position and M(t) at time t. Find the minimum value of d(t), d_{min}, and the earliest time when d(t) = d_{min}, t_{min}.

Input

The first line of input contains a single integer **T**, the number of test cases. Each test case starts with a line that contains an integer **N**, the number of fireflies, followed by **N** lines of the form

```
x y z vx vy vz
```

Each of these lines describes one firefly: (x, y, z) is its initial position at time t = 0, and (vx, vy, vz) is its velocity.

Output

For each test case, output

```
Case #X: d_min t_min
```

where **X** is the test case number, starting from 1. Any answer with absolute or relative error of at most 10^{-5} will be accepted.

Limits

All the numbers in the input will be integers.
1 ≤ **T** ≤ 100
The values of x, y, z, vx, vy and vz will be between -5000 and 5000, inclusive.

Small dataset

$3 \le \mathbf{N} \le 10$

Large dataset

$3 \le \mathbf{N} \le 500$

Sample

Input	Output
3 3 3 0 -4 0 0 3 -3 -2 -1 3 0 0 -3 -1 2 0 3 0 3 -5 0 0 1 0 0 -7 0 0 1 0 0 -6 3 0 1 0 0 4 1 2 3 1 2 3 3 2 1 3 2 1 1 0 0 0 0 -1 0 10 0 0 -10 -1	Case #1: 0.00000000 1.00000000 Case #2: 1.00000000 6.00000000 Case #3: 3.36340601 1.00000000

Notes

Given **N** points (x_i, y_i, z_i), their center of the mass is the point (x_c, y_c, z_c), where:

$$x_c = (x_1 + x_2 + ... + x_N) / N$$
$$y_c = (y_1 + y_2 + ... + y_N) / N$$
$$z_c = (z_1 + z_2 + ... + z_N) / N$$