Round 1A 2012

A. Password Problem
B. Kingdom Rush
C. Cruise Control

Contest Analysis
Questions asked

Submissions

Password Problem
10pt | Not attempted **3506/3846 users** correct (91%)
10pt | Not attempted **2329/3371 users** correct (69%)

Kingdom Rush
15pt | Not attempted **1908/3460 users** correct (55%)
18pt | Not attempted **1616/1844 users** correct (88%)

Cruise Control
17pt | Not attempted **65/312 users** correct (21%)
30pt | Not attempted **22/42 users** correct (52%)

Top Scores

SnapDragon	100
pieguy	100
dzhulgakov	100
squark	100
wata	100
Plagapong	100
omeometo	100
ploh	100
cedriclin	100
MRoizner	100

Problem C. Cruise Control

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
17 points
Solve C-small

Large input
30 points
Solve C-large

Problem

Cruise control is a system that allows a car to go at a constant speed, while the driver controls only the steering wheel. The driver can, of course, turn off the cruise control to avoid collisions.

In this problem, we will consider a one-way road with two lanes, and **N** cars using cruise control on the road. Each car is 5 meters long and goes at some constant speed. A car can change lanes at any time if it would not cause the car to collide with some other car (touching does not count as collision). Assume that changing lanes is instantaneous and simply causes the car to switch to the other lane. We are interested in whether any driver will have to turn off cruise control eventually to avoid a collision, or is it possible for all of them to drive (possibly switching lanes, but at constant speed) without collisions indefinitely. Note that even though changing lanes is instantaneous, two cars driving side by side *cannot* exchange places by changing lanes at the same time.

Input

The first line of the input file gives the number of test cases, **T**. **T** test cases follow. Each test case begins with the number **N**. **N** lines follow, each describing a single car. Each line contains a character $\mathbf{C_i}$ (denoting whether the car is initially in the left or the right lane), two integers describing the speed $\mathbf{S_i}$ of the car (in meters per second), and the initial position $\mathbf{P_i}$ of the car (in meters), denoting the distance between the rear end of the car and some fixed line across the road. All the cars are moving away from this line, and no car is behind the line.

Output

For each test case output one line containing "Case #x: y", where x is the case number (starting from 1) and y is either the word "Possible" (quotes for clarity only), if the cars can drive at the given constant speeds indefinitely, or the maximum number of seconds they can drive before somebody has to change speed to avoid a collision. Answers accurate to within 10^{-5} absolute or relative error will be accepted.

Limits

$1 \le \mathbf{T} \le 30$.
$1 \le \mathbf{S_i} \le 1000$.
$0 \le \mathbf{P_i} \le 10000$.
Each of the $\mathbf{C_i}$ characters will be either *L*, denoting the left lane, or *R*, denoting the right lane.
Initially the cars' positions are such that they do not collide, that is, if two cars *i* and *j* have the same initial starting lane (that is, $C_i = C_j$), then $|P_i - P_j| \ge 5$.

Small dataset

$1 \le \mathbf{N} \le 6$.

Large dataset

$1 \le \mathbf{N} \le 50$.

Sample

Input	Output
4 2 L 5 10 L 100 0 3 L 100 0 R 100 0 L 50 505 6 L 30 0	Case #1: Possible Case #2: 10 Case #3: 1.4 Case #4: 12

```
R 30 2
L 10 39
R 10 42
L 25 13
L 15 29
4
L 4 0
L 2 29
L 1 35
L 1 44
```

In the first case, the faster car can shift over to the right lane and easily overtake the slower one. In the second case, the two cars driving side-by-side at 100 m/s will reach the car going 50 m/s in 10 seconds, and somebody will have to change speed, as both lanes will be blocked.

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