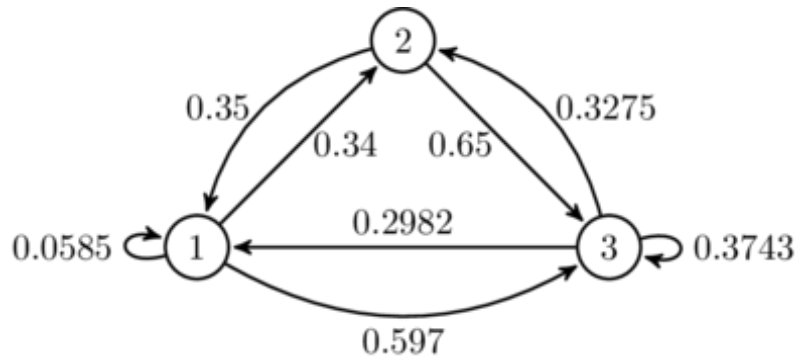


Markov Chain

Input File: markov.txt

In mathematics, there is a concept called Markov Chain. A markov chain is a set of points, each of which has a numerical value, and with every “step”, each point distributes its value based on defined instructions. Below is an example of a markov chain:



In the example above, for every step, point 1 gives 34% of its value to point 2, and point 2 gives 35% of its value to point 1. Point 1 also gives 5.85% of its value to itself (i.e. it keeps 5.85% of its value) and gives 59.7% of its value to point 3.

Eventually, after enough steps, the values of the points are in equilibrium, meaning they don't change. Your job is to determine the equilibrium value of each point of a given markov chain.

Input:

The first line contains an integer, N; There are N cases. For each case, the first line will be an integer, M. M lines of text will follow. These lines are defining the markov chain. They will be structure like this “A P - B”, which means point A gives P percent of its value to point B. For any undefined links between points, you may assume the value is 0. The total percentage distributed from a point will never rise above or below 1.

Output:

You should output the double values of each point in equilibrium, rounded to the nearest hundredth. It should be sorted, by alphabetical order, meaning point A's value should be displayed before point B's value.

Example Input:

3
8

A 0.0585 - A
A 0.3445 - B
A 0.597 - C
B 0.35 - A
B 0.65 - C
C 0.2982 - A
C 0.3275 - B
C 0.3743 - C
2
S 1 - X
X 1 - X
9
B 0 - B
A 0.25 - C
C 0.50 - B
C 0 - C
C 0.50 - A
A 0.50 - A
A 0.25 - B
B 0.33 - A
B 0.67 - C

Example Output:

0.25
0.25
0.50
0.00
1.00
0.46
0.26
0.29