

E. Collisions

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

On a number line there are n balls. At time moment 0 for each ball the following data is known: its coordinate x_i , speed v_i (possibly, negative) and weight m_i . The radius of the balls can be ignored.

The balls collide elastically, i.e. if two balls weighing m_1 and m_2 and with speeds v_1 and v_2 collide, their new speeds will be:

Your task is to find out, where each ball will be t seconds after.

Input

The first line contains two integers n and t ($1 \leq n \leq 10$, $0 \leq t \leq 100$) — amount of balls and duration of the process. Then follow n lines, each containing three integers: x_i , v_i , m_i ($1 \leq |v_i|$, $m_i \leq 100$, $|x_i| \leq 100$) — coordinate, speed and weight of the ball with index i at time moment 0.

It is guaranteed that no two balls have the same coordinate initially. Also each collision will be a collision of not more than two balls (that is, three or more balls never collide at the same point in all times from segment $[0; t]$).

Output

Output n numbers — coordinates of the balls t seconds after. Output the numbers accurate to at least 4 digits after the decimal point.

Examples

| input |
|------------------------------|
| 2 9 3 4 5 0 7 8 |
| output |
| 68.538461538 44.538461538 |

| input |
|---|
| 3 10 1 2 3 4 -5 6 7 -8 9 |
| output |
| -93.666666667 -74.666666667 -15.666666667 |