Problem G. Great Chase

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	1024 megabytes

Game of *Cops and Robber* is played on a long street, which for the purpose of this problem can be identified with the number axis. One player (the robber) places himself on the 0 position on the axis, and the remaining n players (cops) stand on both of his sides (at least one on each side). At the start of the game, each cop starts running towards the robber at a set speed, and the robber starts escaping at the speed of v, which is greater than the speed of any cop, going rightwards (along the increasing values on the axis). Every time the robber reaches the first cop rushing at him, he turns back in negligibly short time and continues running in the opposite direction. This situation repeats until two cops running in the opposite directions meet, with the robber between them.

For a given set of initial positions of the robber and the cops, determine the total distance the robber will travel throughout the game.

Input

The first line of input contains the number of test cases z ($1 \le z \le 10\,000$). The descriptions of the test cases follow.

The first line of the test case contains two integers n ($2 \le n \le 400\,000$) and v ($1 < v \le 10^6$) - number of cops and robber's speed.

Each of the following n lines of the test case contains two integers p_i ($-10^{12} \le p_i \le 10^{12}$, $p_i \neq 0$) and v_i ($1 \le v_i < v$) - the starting position and the speed of the i-th cop.

The total number of cops in all test cases will not exceed $2 \cdot 10^6$.

Output

For each test case, on a separate line, write one real number in decimal format (not in scientific notation), representing the distance travelled by the robber. For the answer to be considered correct, the relative or absolute error should not exceed 10^{-8}. In other words, if your algorithm answers a and the correct answer is b, then your answer will be accepted if $\frac{|a-b|}{\max(1,b)} \le 10^{-8}$.

Your output number should have no more than 20 digits after the decimal point.

Example

standard input	standard output
3 4 9 10 2 -7 2 -6 1 7 1 2 8 -1 7 1 6 2 3 -1000000000000 1 1000000000000 1	38.25 1.23076923 3000000000000

Empty lines in the sample input have been added for readability. They are not present in the test files on which your solution will be run.

Notes

Note that in this problem we consider both absolute and relative error. In particular, this means that when the correct answer is large, your program's allowed error is also large. In the last sample test case, the correct answer is $3 \cdot 10^{12}$, so any number that differs from it by no more than 30 000 would be accepted.