The 32nd Annual

ACM International Collegiate Programming Contest ASIA Regional - Seoul

Problem F

Meteor

The famous Korean internet company nhn has provided an internet-based photo service which allows users to directly take a photo of an astronomical phenomenon in space by controlling a high-performance telescope owned by nhn. A few days later, a meteoric shower, known as the biggest one in this century, is expected. nhn has announced a photo competition which awards the user who takes a photo containing as many meteors as possible by using the nhn photo service. For this competition, nhn provides the information on the trajectories of the meteors at their web page in advance. The best way to win is to compute the moment (the time) at which the telescope can catch the maximum number of meteors.

You have n meteors, each moving in uniform linear motion; the meteor m_i moves along the trajectory $p_i + t \times v_i$ over time t, where t is a non-negative real value, p_i is the starting point of m_i and v_i is the velocity of m_i. The point $p_i = (x_i, y_i)$ is represented by X-coordinate x_i and Y-coordinate y_i in the (X, Y)-plane, and the velocity $v_i = (a_i, b_i)$ is a non-zero vector with two components a_i and b_i in the (X, Y)-plane. For example, if $p_i = (1,3)$ and $v_i = (-2,5)$, then the meteor m_i will be at the position $(0, 5.5)$ at time $t = 0.5$ because $p_i + t \times v_i = (1,3) + 0.5 \times (-2,5) = (0,5.5)$. The telescope has a rectangular frame with the lower-left corner (0, 0) and the upper-right corner (w, h). Refer to Figure 1. A meteor is said to be in the telescope frame if the meteor is in the interior of the frame (not on the boundary of the frame). For example, in Figure 1, p_2, p_3, p_4, and p_5 cannot be taken by the telescope at any time because they do not pass the interior of the frame at all. You need to compute a time at which the number of meteors in the frame of the telescope is maximized, and then output the maximum number of meteors.

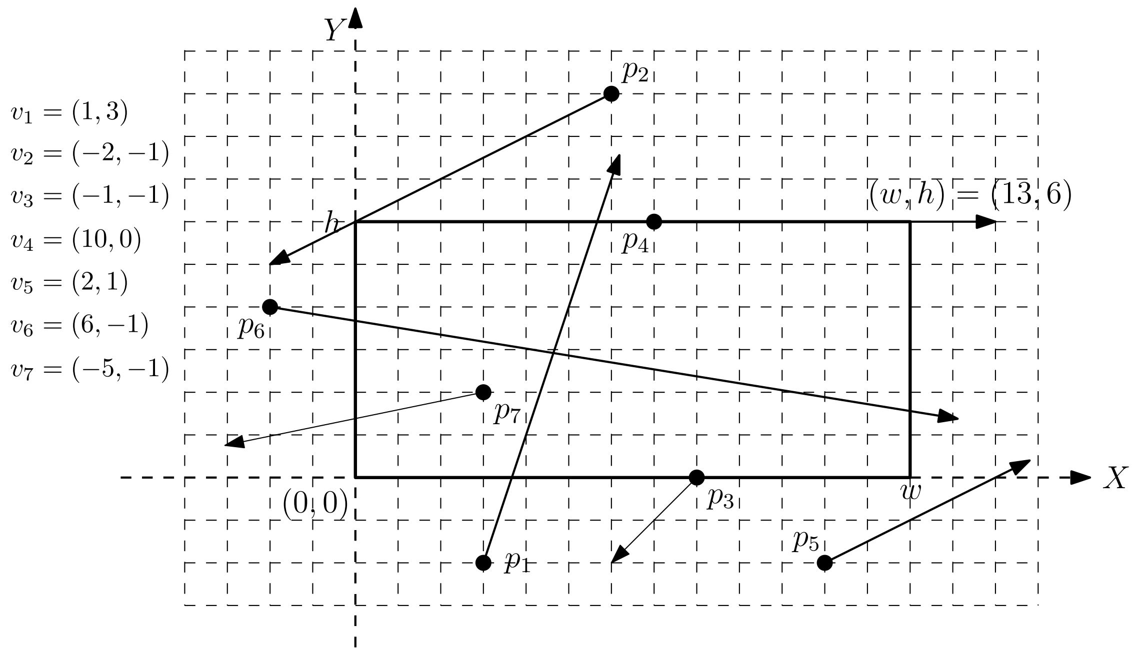

Figure 1

Input

Your program is to read the input from standard input. The input consists of T test cases. The number of test cases T is given in the first line of the input. Each test case starts with a line containing two integers w and h ($1 \le w, h \le 100{,}000$), the width and height of the telescope frame, which are separated by single space. The second line contains an integer n, the number of input points (meteors), $1 \le n \le 100{,}000$. Each of the next n lines contain four integers x_i, y_i, a_i, and b_i; (x_i, y_i) is the starting point p_i and (a_i, b_i) is the non-zero velocity vector v_i of the i-th meteor; x_i and y_i are integer values between -200,000 and 200,000, and a_i and b_i are integer values between -10 and 10. Note that at least one of a_i and b_i is not zero. These four values are separated by single spaces. We assume that all starting points p_i are distinct.

Output

Your program is to write to standard output. Print the maximum number of meteors which can be in the telescope frame at some moment.

The following shows sample input and output for two test cases.

Sample Input	Output for the Sample Input
2 4 2 2 -1 1 1 -1 5 2 -1 -1 13 6 7 3 -2 1 3 6 9 -2 -1 8 0 -1 -1 7 6 10 0 11 -2 2 1 -2 4 6 -1 3 2 -5 -1	1 2