

Problem 3 - Autoaim spam (autoaim)

RPGs make up a large part of the video-game scene worldwide, along with MOBAs and MMORPGs. But what really made some of these titles' famous wasn't just the chance to play online with, or against, other players. It was how easy they were to learn the game dynamics, without discouraging new players. By introducing the autoaim.

Autoaim is a system that allows all players to aim and shoot by simply pressing a button (or tapping the screen) and letting the CPU do all the dirty work. Imagine downloading a new "shoot-em-up" game, starting your campaign and being unable to kill your enemies because, you don't yet have the skills or confidence to aim and shoot. But start with autoaim and your gaming experience at the beginning will be much more positive because you'll make much more progress. And that releases serotonin in your body, which is a mood enhancer.

The battlefield is a grid (C columns \times R rows, counting from 0), where the bottom left corner has coordinate (0,0). You are Player1 and you're positioned in row 0, faced with a defined number of enemies E distributed in the battlefield. Each enemy has He life points and covers only one spot on the field with initial coordinate X and Y given. The battle is divided into rounds, and for each round you have S shots available. With each shot you autoaim at the nearest row, hitting each enemy on that row. Each enemy hit causes damage equal to $D - F \times H$ (0 if negative) where D is the base damage, F is the distance between the row where the enemy is, and row 0, H is the amount of damage. When your enemies life points reach 0 (or less) they are removed from the field. At the end of the round, your enemies will advance by one row towards row 0. If an enemy is already on row 0 at the end of the turn it will start next turn from the last row.

Calculate how many times Player1 must shoot to defeat all enemies.

Input data

The first line of the input file contains an integer T , the number of test cases to solve.

For each test case, the first line of the input file contains the integers:

- R , the numbers of rows on the grid
- C , the number on columns
- N , number of enemies
- S , number of shots for each round
- D , the damage that Player1 cause with each shot
- H , the amount of damage reduction for each row far from row 0

The next N lines will display enemy information:

- the enemy Id
- the life points He
- the X position on the grid
- the Y position on the grid

Where X is the row and Y is the column.

Output data

The output file must contain **T** lines.

For each test case in the input file, the output file must contain the number of shoots **C** used to clear the field.

Constraints

- $1 \leq D \leq 2\,500$
- $1 \leq He \leq 25\,000$
- $1 \leq H \leq 100\,000$
- $1 \leq S \leq 20$
- $1 \leq E \leq R \times C$

Scoring

- input 1** : $T = 5, R \leq 2, C \leq 2, H = 1$.
- input 2** : $T = 5, R \leq 10, C \leq 5, H \leq D$.
- input 3** : $T = 10, R \leq 25, C \leq 15, H \leq D$.
- input 4** : $T = 15, R \leq 50, C \leq 30, H \leq 2 \times D$.
- input 5** : $T = 20, R \leq 100, C \leq 200, H \leq 2 \times D$.

Examples

input	output
1 4 4 3 2 20 5 0 50 1 3 1 10 2 2 2 20 3 3	Case #1: 6

Explanation

In this example you have two shoots available per turn and you have to kill three enemies positioned as in the image. You shoot the enemy twice with id 0 and they lose 15 life points (20-5) twice, then all the enemies move towards row 0. Then you can kill two enemies (id 0 and 1). The first receives damage equal to 20 (no malus for distance) the other loses 15 life points (but only has 10). Finally, the enemy is eliminated with two shots of 15.

