PROBLEM K **MICROSPIKES** **30 POINTS**

In a study of domestic power consumption, researchers built a simulator for New Zealand homes. For each home the software simulates the power consumption of appliances. The goal of the project was to identify microspikes in power usage – short periods of time during which total power consumption rose above a specified limit.

Before a simulation starts all appliances are turned off (using no power). At various times during the simulation period appliances will increase or decrease their power usage. Every time this happens the simulator outputs a record with the appliance number, the time (seconds) since that appliance's last change (or since the start of the simulation if it's the first record for the appliance), and the change in power level (watts). For a given appliance, records are in order, but unfortunately the simulation was written in such a way that results for different appliances are randomly interleaved. In particular, it cannot be assumed that a record for appliance A, written before a record for appliance B, reports an event on appliance A that occurred before B's event.

Your task is to write a program to read files of appliance records and count the number of microspikes that occur. For any given simulation you will be given a power threshold M and a time threshold S. A microspike occurs if the power level P satisfies $P > M$ for a period of time t_s: $1 \le t_s \le S$.

Input

Your input is data from a one simulation. It begins with a line holding three integers (T, M and S), separated by single spaces. T is the total simulation time in seconds , M is the power threshold and S is the maximum spike duration.

Following are N power change lines. Each holds three integers (a, t and p), again separated by single spaces: 'a' is the appliance number, 't' is the time in seconds since that appliance's last change and 'p' is the change in power level.

A line with three zeros indicates the end of data for the simulation.

A microspike is only counted if:

1. The total power increases from at or below the threshold to above it at some time during the simulation, and
2. The total power decreases again to the threshold or below during the simulation, and
3. The duration of the spike is between 1 and S seconds inclusive.

Input limits

- $0 \le T \le 100{,}000$
- $0 \le M \le 10^9$
- $1 \le S \le 1000$
- $0 \le N \le 1{,}000{,}000$
- $1 \le a \le 100{,}000$
- $0 \le t \le T$

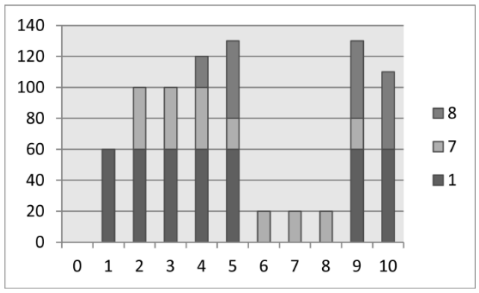
- -10,000 ≤ *p* ≤ 10,000
- You can assume that the power level of an appliance never goes negative, and that total power consumption never exceeds 1,000,000,000.

Output

For each simulation one line of output is required: the number of microspikes observed.

Sample Input (see graph on right)

```
10 100 2
8 4 20
8 1 30
1 1 60
7 2 40
7 3 -20
1 5 -60
1 3 60
7 5 -20
8 1 -50
8 3 50
0 0 0
```



Total power consumption for sample input. Labels on the horizontal axis are the times for the starts of the seconds represented by the bar. All power changes occur instantaneously at the start of a second. Note that the column at time 10 is not part of the simulation. It is included in the chart to show the power level that continues indefinitely after the simulation end.

Output for Sample Input

```
1
```