IOI Training Camp 2011 – Final 1, 21 June, 2011

Problem 1 Complan Carnival

In the Complan Carnival, there are N fun rides. Each ride has a height restriction: to enter ride i your height must be at least t_i. It costs m_i to take the ride and, as you might expect, your height increases by h_i at the end of the ride.

Initially you have M units of money and your height is H. Your aim is to take as many rides as possible, subject to satisfying the height and cost constraints, with the condition that no ride is taken twice.

For instance, suppose the carnival has 5 rides, as follows.

i	$t[i]$	$m[i]$	$h[i]$
1	3	4	5
2	10	1	13
3	2	4	0
4	1	10	7
5	1	2	2

Assume that your height is initially 1 and you start with 10 units of money. You can begin with ride 5, spend 2 units of money and increase your height to 3. Since your height is at least 3, you can now take ride 1, spend 4 units of money and increase your height to 8. At this point you have 4 units of money left. Finally, you can take ride 3, after which you have run out of money. In this example, it turns out that the maximum number of rides you can take is 3.

Your task is to write a program that computes the maximum number of rides you can take in a given instance of the Complan Carnival.

Input format

The first line contains 3 integers: N, the number of rides, M, the amount of money you start with and H, your initial height.

The next N lines describe the N rides. For $1 \leq i \leq N$, line i+1 of the input contains 3 integers describing ride i: t_i, how tall you have to be to take this ride, m_i, the cost of this ride and h_i, the amount your height increases if you take this ride.

Output format

A single integer denoting the maximum number of rides you can go on.

Test Data

In all subtasks, $0 \leq m_i \leq M \leq 10^3$.

- *Subtask 1 (10 marks):* $1 \leq N \leq 18$, $0 \leq t_i, H, h_i \leq 100$.
- *Subtask 2 (30 marks):* $1 \leq N \leq 100$, $0 \leq t_i, H, h_i \leq 100$.
- *Subtask 3 (60 marks):* $1 \leq N \leq 100$, $0 \leq t_i, H, h_i \leq 10^7$.

Sample input

```
5 10 1
3 4 5
10 1 13
2 4 0
1 10 7
1 2 2
```

Sample output

```
3
```

Time and memory limits

The time limit for this task is 1 second. The memory limit is 128 MB.