Problem F
Machine Works
Problem ID: works

You are the director of Arbitrarily Complex Machines (ACM for short), a company producing advanced machinery using even more advanced machinery. The old production machinery has broken down, so you need to buy new production machines for the company. Your goal is to make as much money as possible during the restructuring period. During this period you will be able to buy and sell machines and operate them for profit while ACM owns them. Due to space restrictions, ACM can own at most one machine at a time.

During the restructuring period, there will be several machines for sale. Being an expert in the advanced machines market, you already know the price P_i and the availability day D_i for each machines M_i. Note that if you do not buy machine M_i on day D_i, then somebody else will buy it and it will not be available later. Needless to say, you cannot buy a machine if ACM has less money than the price of the machine.

If you buy a machine M_i on day D_i, then ACM can operate it starting on day $D_i + 1$. Each day that the machine operates, it produces a profit of G_i dollars for the company.

You may decide to sell a machine to reclaim a part of its purchase price any day after you've bought it. Each machine has a resale price R_i for which it may be resold to the market. You cannot operate a machine on the day that you sell it, but you may sell a machine and use the proceeds to buy a new machine on the same day.

Once the restructuring period ends, ACM will sell any machine that it still owns. Your task is to maximize the amount of money that ACM makes during the restructuring.

Input

The input consists of several test cases. Each test case starts with a line containing three positive integers N, C, and D. N is the number of machines for sale ($N \leq 10^5$), C is the number of dollars with which the company begins the restructuring ($C \leq 10^9$), and D is the number of days that the restructuring lasts ($D \leq 10^9$).

Each of the next N lines describes a single machine for sale. Each line contains four integers D_i, P_i, R_i and G_i, denoting (respectively) the day on which the machine is for sale, the dollar price for which it may be bought, the dollar price for which it may be resold and the daily profit generated by operating the machine. These numbers satisfy $1 \leq D_i \leq D$, $1 \leq R_i < P_i \leq 10^9$ and $1 \leq G_i \leq 10^9$.

The last test case is followed by a line containing three zeros.

Output

For each test case, display its case number followed by the largest number of dollars that ACM can have at the end of day $D + 1$.

Follow the format of the sample output.

Sample input	Output for the Sample Input
6 10 20 6 12 1 3 1 9 1 2 3 2 1 2 8 20 5 4 4 11 7 4 2 10 9 1 0 0 0	Case 1: 44