Problem Ski Circuit

Input file	stdin
Output file	stdout

After leaving Los Angeles, Little AD arrived in the Info(1)cup Ski Resort, the largest ski resort in the Info(1)cup Kingdom. The ski resort is made of $N + 1$ points numbered from 0 to N. The height of point i is H_i, and $H_0 = 0$. There are no two points that have the same height.

For any two points i and j with $H_i < H_j$, there exists one chairlift that takes skiers from point i to point j and one slope that takes skiers from point j to point i. Taking the slope from point j to point i takes exactly $H_j - H_i$ seconds. Please note that when taking the slope from point j to point i, skiers are **not** required to visit all points p with $H_i < H_p < H_j$. Moreover, when taking a chairlift from point i to point j, skiers cannot stop at any point $p \neq j$.

It takes a skier U_i seconds to get on a chairlift at point i (regardless of where that chairlift goes) and C_i seconds to get off a chairlift at point i (regardless of where that chairlift comes from). $U_0 = C_0 = 0$.

Little AD wants to make a K-second circuit. That is, he wants to start from point 0, visit all the other N points exactly once, and then return to point 0, and he wants to spend **at least** K seconds on the slopes.

Little AD hates (as much as any proven skier) to stay in one point for too long. Therefore, let W_i be the total time Little AD spends at point i, and let M be the maximum value among all W_i. Note that $W_0 = 0$ and, for all $1 \leq i \leq N$:

- $W_i = 0$, if Little AD reaches point i on a slope and leaves point i on a slope,
- $W_i = C_i$, if Little AD reaches point i with a chairlift and leaves point i on a slope,
- $W_i = U_i$, if Little AD reaches point i on a slope and leaves point i with a chairlift,
- $W_i = U_i + C_i$ if Little AD reaches point i with a chairlift and leaves point i with a chairlift.

Now Little AD wonders: how much time does he need to spend in a single point so that he skis for a total of at least K seconds? That is, what is the minimum value of M he could achieve in order to spend at least K seconds on the slopes?

Little AD needs your help! For T given scenarios, you must find the minimum value of M and help Little AD enjoy his well deserved ski holiday!

Input data

The first line of input contains T, the number of scenarios your program will have to solve. For each of the T scenarios, the first line will contain N and K. The i-th of the following N lines will contain three values H_i, U_i and C_i. Please note that the input does not contain the values H_0, U_0 and C_0, since $H_0 = U_0 = C_0 = 0$.

Output data

There should be exactly T lines of output, with the i-th line of output containing the answer for the i-th scenario.

Restrictions

- It is guaranteed that LITTLE AD can ski at least K seconds.
- $1 \leq T \leq 200$.
- Let $\sum N$ denote the sum of the values of N for all scenarios.
- $1 \leq \sum N \leq 200\,000$.
- $1 \leq K \leq 10^{12}$
- $1 \leq H_i, U_i, C_i \leq 10^6$, for all $1 \leq i \leq N$

#	Points	Restrictions
1	6	$1 \leq \sum N \leq 10$
2	9	$1 \leq \sum N \leq 17$
3	19	$1 \leq \sum N \leq 300$
4	22	$1 \leq \sum N \leq 2\,000$
5	44	No further restrictions.

Examples

Input file	Output file
2	2
3 5	8
1 8 6	
5 3 2	
2 6 8	
3 6	
1 8 6	
5 3 2	
2 6 8	

Explanations

First scenario. LITTLE AD gets on the chairlift at point 0, then he gets off at point 2 and skies down to point 3. There he skies down to point 1, where he skies back to point 0.

$$W_0 = W_1 = W_3 = 0; W_2 = 2$$

Second scenario. LITTLE AD gets on the chairlift at point 0 and goes up to point 2, where he gets off. Then he skies down to point 1. There he gets on the chairlift and goes up to point 3, where he gets down and skies back to point 0.

$$W_0 = 0; W_1 = W_3 = 8; W_2 = 2$$