

Problem F. Fastest walking strategy

There is a 1D line. You are standing on a point with coordinate 0, and your aim is to go to your house, which is on a point with coordinate L . You and your house are both too small, so both can be considered as a point.

Currently, the time is 0. You want to return to your home as fast as possible. The only possible way to go is just walking. It takes 1 second for you to walk distance 1. By instinct, we know that in the best case, you need L seconds to arrive at your home.

However, in coordinates x_1, x_2, \dots, x_n (all distinct), there is a gate. The gate at coordinate x_i remains closed before time t_i comes, and it is open for a_i seconds, and then closed for b_i seconds, and then open for a_i seconds, and closed for b_i seconds, ..., and so on. So the gate is open only for the time intervals $[t_i, t_i + a_i]$, $[t_i + a_i + b_i, t_i + 2a_i + b_i]$, ..., $[t_i + na_i + nb_i, t_i + (n+1)a_i + nb_i]$ for all integers $n \geq 0$.

You can pass the gate only when it's open. When the gate at coordinate x_i is closed, you can go to coordinate x_i , but cannot go further. (points that have larger coordinates than x_i) Fortunately, it takes no time to pass the gate, so you can go further immediately after the gate is open.

Given L , $x_{1..n}$, $t_{1..n}$, $a_{1..n}$ and $b_{1..n}$, write a program that calculates the fastest time that you can go to your house.

Input

Your input consists of an arbitrary number of records, but no more than 50.

Each input record consists of $n + 1$ lines. The first line contains two integers n ($1 \leq n \leq 1,000$) and L ($2 \leq L \leq 10^9$). The $(i + 1)$ -th line ($1 \leq i \leq n$) contains four integers x_i ($1 \leq x_i < L$), t_i ($0 \leq t_i \leq 10^9$), a_i ($1 \leq a_i \leq 10^9$) and b_i ($1 \leq b_i \leq 10^9$), each separated by a space.

It is guaranteed that x_i are given in increasing order: $1 \leq x_1 < x_2 < \dots < x_n < L$.

The end of input is indicated by a line containing only the value -1 .

Output

For each input record, print a line that contains the integer describing the fastest time that you can go to your house.

Example

Standard input	Standard output
3 10 2 1 2 4 5 3 3 3 7 5 1 10 1 2 1 1000 99 88 -1	19 1001

Time Limit

1 second.