Problem F. The Glorious Karlutka River =)

Input file:	`karlutka.in`
Output file:	`karlutka.out`
Time limit:	2 seconds
Memory limit:	256 megabytes

A group of M *tourist*s are walking along the Karlutka river. They want to cross the river, but they couldn't find a bridge. Fortunately, there are some piles of rubbish floating in the water, and the *tourist*s have decided to try to cross the river by jumping from one pile to another.

A *tourist* can move up to D meters in any direction at one jump. One jump takes exactly one second. *tourist*s know that the river is W meters wide, and they have estimated the coordinates of rubbish piles (X_i, Y_i) and the capacity of each pile (Ci, the maximum number of *tourist*s that this pile can hold at the same time). Rubbish piles are not very large and can be represented as points. The river flows along the X axis. *tourist*s start on the river bank at 0 by Y axis. The Y coordinate of the opposite bank is W.

*tourist*s would like to know if they can get to the opposite bank of the river, and how long it will take.

Input

First line of input consists of four integers: number of rubbish piles N ($0 \leqslant N \leqslant 50$), number of *tourist*s M ($0 < M \leqslant 50$), maximum length of *tourist*'s jump D ($0 \leqslant D \leqslant 1000$), and width of the river W ($0 < W \leqslant 1000$) Following N lines describe the rubbish piles, each line consists of three integers: ($0 < X_i < 1000, 0 < Y_i < W, 0 \leqslant C_i \leqslant 1000$) — pile coordinates and capacity.

Output

Output a single number indicating the minimal time (in seconds) in which all *tourist*s will be able to cross the river, or the line "IMPOSSIBLE" if it is impossible to cross the river.

Examples

karlutka.in	karlutka.out
3 10 3 7 0 2 2 4 2 2 2 4 3	6
3 10 3 8 0 2 2 4 2 2 2 4 3	IMPOSSIBLE