

Problem F. Frogs secret meeting

Source file name: F.c, F.cpp, F.java, F.py2, F.py3
Input: Standard
Output: Standard
Author(s):

Lately there have been a lot of problems about frogs. It seems this is not some kind of coincidence. Frogs have been meeting secretly to plan how to get a problem set with just frogs problems on “El Gran Premio”.

These reunions can lead to have a very boring set, all talking about frogs, jumps and rocks. You want to stop it and have studied how frogs behave before their meetings so you are now ready to interrupt one of the meetings and avoid at all cost that the frogs take the problem set for the next competition.

The frogs plan their reunion in a pond where a number of frogs are standing on a number of rocks. The frogs can have the meeting in a rock where all the frogs can stand at the same time. The frogs do not like to get into the water because it can make a lot of noise and then their meeting would not be secret that's why they jump from one rock to another as long as their distance is less or equal to the maximum distance D a frog can jump.

Frogs put a lot of caution before their meetings, they know that too much jumps may look suspicious so they avoid jumping out too much from any rock because doing much jumps from the same rock could look suspicious to anyone looking at the pond. As frogs are experts hiding their plans they already know exactly how many times they can jump out of each rock before jumping from that rock looks suspicious, it is not suspicious that a frog lands on a rock, only when they jump out of the rocks.

Can you find all the rocks where the frogs can have their secret meeting?

Input

On the first line one positive number T the number of test cases. Each of the T test cases start with one line with the integer N and a floating-point number D , denoting the number of rocks in the pond and the maximum distance a frog can jump. Each of the next N lines contains X_i , Y_i , n_i and m_i , denoting for rock i its X and Y coordinate, the number of frogs on it and the maximum number of times a frog can jump off this rock before it looks suspicious.

- $1 \leq T \leq 100$
- $1 \leq N \leq 100$
- $1 \leq D \leq 10^5$
- $-10^4 \leq X_i, Y_i \leq 10^4$
- $0 \leq n_i \leq 10$
- $1 \leq m_i \leq 200$

Output

For each test case print one line containing a space-separated list of 0-based indices of the rocks on which the frogs can have their meeting this list should be in increasing order. If no such rock exists, output a line with the single number -1.

Example

Input	Output
2	1 2 4
5 3.5	-1
1 1 1 1	
2 3 0 1	
3 5 1 1	
5 1 1 1	
5 4 0 1	
3 1.1	
-1 0 5 10	
0 0 3 9	
2 0 1 1	