

Problem C. Portkeys

Input file: *standard input*
Output file: *standard output*
Time limit: 3 seconds
Memory limit: 256 mebibytes

There are n portkeys located on a straight line. Each portkey has three characteristics: x_i (coordinate of the portkey), l_i and r_i . A portkey can be used to teleport to different points on the line. That is, if you are standing at the point x_i , you can use the portkey to instantly teleport to any point y that satisfies $l \leq |x_i - y| \leq r$. You are not allowed to move along the line without using a portkey. Initially, you are located at the point x_1 (the location of the first portkey).

You are also given m target points on the line. For each target point, find the smallest number of portkeys to be used to get to this point from the start.

Input

The first line contains one integer n , the number of portkeys ($1 \leq n \leq 2 \cdot 10^5$).

Each of the next n lines contains three space-separated integers x_i, l_i, r_i : the characteristics of the i -th portkey ($-10^9 \leq x_i \leq 10^9, 0 \leq l_i \leq r_i \leq 10^9$).

The next line contains one integer m , the number of target points ($1 \leq m \leq 2 \cdot 10^5$).

The last line contains m space-separated integers y_i : the coordinates of the target points ($-10^9 \leq y_i \leq 10^9$).

Note that an arbitrary number of portkeys and target points can be located at the same point on the line.

Output

On the first line, print space-separated answers for all target points in the same order the points are given in the input. The answer for a target point is the smallest number of portkeys that are needed to be used in order to get to the point, or -1 if the target point is unreachable via portkeys.

Examples

standard input	standard output
1 1 2 3 4 1 2 3 4	0 -1 1 1
2 0 3 5 5 6 7 5 3 3 12 5 6	1 1 2 1 -1