Babylonian Wall

A civilized city, called X, in Old Babylon was surrounded by a wall of rectangular shape whose sides see precisely the north, south, east, and west. The location of this historical city is currently not known, while the wall of city X is known from the old literature to have thickness at most W meters at any point.

An English research team recently found a ruin that is considered of the Old Babylonian period. Your task is to decide if there is any possibility that this ruin is from the wall of X by a computer program. More specifically, your program should decide the ruin has a rectangular shape pointing north, south, east, and west of thickness at most W when the ruin is given by the locations of parts of the ruin.

The location of each part of the ruin is represented by a point with coordinates (x, y), where the x-axis and y-axis precisely point the west/east and the south/north, respectively. Thus, the ruin is given as a set of N points in the plane. The unit distance of this coordinate system is exactly 1 meter. That is, the distance between two points (0, 0) and (1, 0) is exactly 1 meter.

Note that a further research announced that some parts from the south and the north sides of the wall of X had been spread outwards from their original location; that is, at most K of the N input locations may have y-coordinate either at least that of the north side of the wall or at most that of the south side of the wall.

[Input]

The first line of the input file contains the number T of test cases in the file. In each test case, the first line contains three integers N (the number of points), K (the number of points that can be excluded from the north or south), and W (the maximum thickness of the wall). ($1 \leq N \leq 300,000$, $0 \leq K \leq 300,000$, $1 \leq W \leq 100,000$) The next N lines each contain two integers X and Y ($-2,000,000,000 \leq X, Y \leq 2,000,000,000$), representing the location of a part of the ruin as a point with coordinates (X, Y).

There are two kinds of inputs listed as follows.

- Small Set: $2 \leq N \leq 1,000$, $0 \leq K \leq 1,000$
- Large Set: $2 \leq N \leq 300,000$, $1 \leq K \leq 300,000$

[Output]

For each test case given, print one line with a string “YES” if there is any possibility that the ruin is from the wall of X in the Old Babylonian period; or “NO” otherwise.

[I/O Example]

Input

```
2
7 1 1
1 1
1 5
3 2
3 4
3 7
5 1
5 5
7 0 1
1 1
1 5
3 2
3 4
3 7
5 1
5 5
```

Output

```
YES
NO
```