B: Neighborhoods

Those Who Know About Buffaloes are aware of the way buffaloes group into "Buffalo Neighborhoods". They went on a field trip in the great plains (a huge rectangular pasture whose points are identified by rectilinear coordinates X and Y), and they have observed N buffaloes (conveniently numbered from 1 to N). Each buffalo is grazing at one point in the plane (identified by rectilinear coordinates), and no two buffalo share the same coordinates.

It is interesting to consider when two buffaloes are *neighbors*. This can happen for one of two reasons:

- If the buffaloes are no further than some integer Manhattan distance C apart, they are neighbors. [Manhattan distance is calculated as $d = |x_1 - x_2| + |y_1 - y_2|$.]
- As buffaloes are very friendly, if buffalo A is a neighbor of buffalo Z and buffalo B is a neighbor of buffalo Z, then buffalo A is a neighbor of buffalo B (the "transitive closure of neighbors").

A neighborhood of buffaloes is a set of buffaloes in which any two buffaloes are neighbors. Given the locations of the buffaloes and the distance C, determine the number of neighborhoods, and the number of buffaloes contained in the largest neighborhood.

By way of example, consider the pasture below. When $C = 4$, this pasture has four neighborhoods: a big one on the left, two neighborhoods of size 1 (the lonely buffaloes at the middle), and a huge neighborhood on the right with 60 different buffaloes.

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Input

The first line of the input consists of two space-separated integers giving the number N of buffaloes ($1 \leqslant N \leqslant 100\,000$) and the distance threshold C ($1 \leqslant C \leqslant 1\,000\,000\,000$).

The next N lines give the positions of buffaloes. For $1 \leqslant i \leqslant N$, the i-th of these lines gives the position of the i-th buffalo and consists of two space-separated integers X_i and Y_i, with $1 \leqslant X_i \leqslant$

1 000 000 000. The position $X = 1$, $Y = 1$ corresponds to the lower left corner: for instance, in the figure above, there are buffaloes at position $X = 2$, $Y = 2$ and $X = 5$, $Y = 1$.

Output

A single line with two space-separated integers: the number of buffalo neighborhoods and the size of the largest buffalo neighborhood.

Sample Input

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4 2
1 1
3 3
2 2
10 10
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Sample Output

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2 3
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Sample Explanation

There are 2 neighborhoods, one formed by the first three buffaloes and the other containing only the last buffalo. The largest neighborhood thus contains 3 buffaloes.