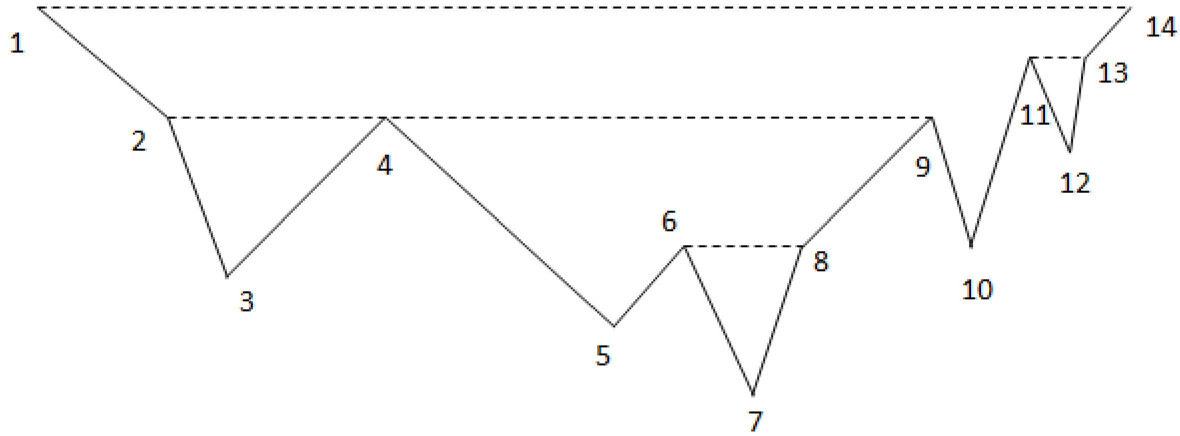
12929 Aerial Tramway

An aerial tramway, cable car, ropeway or aerial tram is a type of aerial lift which uses one or two stationary ropes for support while a third moving rope provides propulsion. With this form of lift, the grip of an aerial tramway cabin is fixed onto the propulsion rope and cannot be decoupled from it during operations.

– Wikipedia

You own a park located on a mountain, which can be described as a sequence of n points (x_i, y_i) from left to right, where $x_i, y_i > 0$, $x_i < x_{i+1}$, $y_i \neq y_{i+1}$ (that means there will not be horizontal segments in the mountain skyline), illustrated below (the x-coordinate of p_i is i):



Since the mountain is very sloppy, some aerial tramways across the park would be very helpful. In the figure above, people can go from p_4 to p_9 directly, by taking a tram. Otherwise he must follow a rather zigzag path: $p_4 - p_5 - p_6 - p_7 - p_8 - p_9$.

Your job is to design an aerial tramway system. There should be exactly m trams, each following a horizontal segment in the air, between two points p_i and p_j. "Horizontal" means $y_i = y_j$, "in the air" means all the points in between are strictly below, i.e. $y_k < y_i$ for every $i < k < j$. For example, no tram can travel between p_2 and p_9, because p_4 is not strictly below $p_2 - p_9$. However, you can have two trams, one from p_2 to p_4, and one p_4 to p_9. There is another important restriction: no point can be strictly below k or more tramways, because it'll be dangerous. For example, if $k = 3$, we cannot build these 3 tramways simultaneously: $p_1 - p_{14}$, $p_4 - p_9$, $p_6 - p_8$, because p_7 would be dangerous.

You want to make this system as useful as possible, so you would like to maximize the total length of all tramways. For example, if $m = 3$, $k = 3$, the best design for the figure above is $p_1 - p_{14}$, $p_2 - p_4$ and $p_4 - p_9$, the total length is 20. If $m = 3$, $k = 2$, you have to replace $p_1 - p_{14}$ with $p_{11} - p_{13}$, the total length becomes 9.

Input

There will be at most 200 test cases. Each case begins with three integers n, m and k ($1 \leq n, m \leq 200$, $2 \leq k \leq 10$), the number of points, the number of trams in your design and the dangerous parameter introduced earlier. The next line contains n pairs of positive integers x_i and y_i. ($1 \leq x_i, y_i \leq 10^5$).

Output

For each test case, print the case number and the maximal sum. If it is impossible to have exactly m tramways, print '`-1`'.

Sample Input

```
14 3 3
1 8
2 6
3 4
4 6
5 3
6 4
7 1
8 4
9 6
10 4
11 6
12 5
13 6
14 8
14 3 2
1 8
2 6
3 4
4 6
5 3
6 4
7 1
8 4
9 6
10 4
11 6
12 5
13 6
14 8
```

Sample Output

```
Case 1: 20
Case 2: 9
```