

10890 Maze

In this problem you are given a square maze of dimension N with $N * N$ blocks. Each block is numbered as follows:

| | | | | |
|-----------|-----------|-------|-----|---------------|
| $N - 1,0$ | $N - 1,1$ | ... | ... | $N - 1,N - 1$ |
| ... | ... | ... | ... | ... |
| $2,0$ | $2,1$ | $2,2$ | ... | ... |
| $1,0$ | $1,1$ | $1,2$ | ... | ... |
| $0,0$ | $0,1$ | $0,2$ | ... | $0,N - 1$ |

The maze has only one entry which is at $(0, 0)$ and only one exit which is at $(N - 1, N - 1)$. From each block you can move in four directions (N, E, W, S) and the cost is 1 for each movement among the maze but collecting treasure does not require any cost. Some blocks contain treasures that you will have to collect. Suppose there are T treasures in the maze and you have to collect at least S ($S \leq T$) treasures from them. In this problem, you are requested to find an optimal way from starting location to ending location and take at least S treasures from the maze. Remember that, you can visit a block more than once if you want.

Input

The first line of the input contains three integers N ($N \leq 30$), T ($T \leq 30$) and S ($S \leq 10$ and $S \leq T$) describing the dimension of the maze, number of treasures in the maze and number of treasures that you can take. After that, there are T lines. Each line contains two numbers representing the position of the treasure in the maze. The input may contain multiple test cases and ends with three zeros for N , T and S .

Output

Each test case produces one line of output. This line should contain the output serial no as shown in the sample output and a number representing the minimum cost which is required to collect the treasures.

Sample Input

```
4 4 4
2 0
2 1
2 2
```

```
0 2
4 4 2
2 0
2 1
2 2
0 2
0 0 0
```

Sample Output

```
Case 1: 10
Case 2: 6
```