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	$\cdots$	$\cdots$	$N-1$,$N-1$
$\cdots$	$\cdots$	$\cdots$	$\cdots$	$\cdots$
2,0	2,1	2,2	$\cdots$	$\cdots$
1,0	1,1	1,2	$\cdots$	$\cdots$
0,0	0,1	0,2	$\cdots$	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
```