Problem D: Largest square

Advanced Algorithms for Programming Contests

Restrictions

Time: 5 seconds
Memory: 512 MB

Problem description

There is an $N \times N$ mosaic of square solar cells. Each solar cell is either good or bad. There are W bad cells. You need to find the largest square within the mosaic containing at most L bad cells.

Input

The input will begin with a number T ($1 \leq T \leq 20$), the number of test cases, on a line by itself. Then follow the T test cases, each consisting of

- one line containing N, W and L ($1 \leq N \leq 2000, 1 \leq W \leq 5 \cdot 10^4$, $0 \leq L \leq W$) – the side length of the grid, the number of bad cells and the maximum amount of bad cells allowed in the subgrid, respectively
- W lines, each containing integers a and b ($1 \leq a, b \leq N$), representing the coordinates of a location of one of the bad solar cells.

Output

For each input instance, the output should be a single integer representing the area of the largest square that contains no more than L bad solar cells.

Sample input and output

Input	**Output**
1 4 3 1 1 1 2 2 2 3	4

Clarification

In the given sample, the mosaic is 4×4, and contains the following arrangement of good and bad cells ('`G`' represents good and '`B`' bad):

```
BGGG
GBBG
GGGG
GGGG
```

Several 2×2 squares at the bottom contain no bad solar cells, but all 3×3 squares contain at least two bad solar cells.