

Round C APAC Test 2017

[A. Monster Path](#)

**B. Safe Squares**

[C. Evaluation](#)

[D. Soldiers](#)

[Questions asked](#)

#### Submissions

##### Monster Path

7pt	Not attempted <b>752/1194 users</b> correct (63%)
8pt	Not attempted <b>655/740 users</b> correct (89%)

##### Safe Squares

6pt	Not attempted <b>1460/1651 users</b> correct (88%)
13pt	Not attempted <b>621/1296 users</b> correct (48%)

##### Evaluation

12pt	Not attempted <b>625/943 users</b> correct (66%)
15pt	Not attempted <b>552/615 users</b> correct (90%)

##### Soldiers

16pt	Not attempted <b>106/239 users</b> correct (44%)
23pt	Not attempted <b>24/63 users</b> correct (38%)

#### Top Scores

johngs	100
NAFIS	100
nathanajah	100
asdsteven	100
hello92world	100
pkwv	100
Sumeet.Varma	100
akulsareen	100
nhho	100
aguss787	100

## Problem B. Safe Squares

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input  
6 points

Solve B-small

Large input  
13 points

Solve B-large

### Problem

Codejamon trainers are actively looking for monsters, but if you are not a trainer, these monsters could be really dangerous for you. You might want to find safe places that do not have any monsters!

Consider our world as a grid, and some of the cells have been occupied by monsters. We define a *safe square* as a grid-aligned  $D \times D$  square of grid cells (with  $D \geq 1$ ) that does not contain any monsters. Your task is to find out how many safe squares (of any size) we have in the entire world.

### Input

The first line of the input gives the number of test cases,  $T$ .  $T$  test cases follow. Each test case starts with a line with three integers,  $R$ ,  $C$ , and  $K$ . The grid has  $R$  rows and  $C$  columns, and contains  $K$  monsters.  $K$  more lines follow; each contains two integers  $R_i$  and  $C_i$ , indicating the row and column that the  $i$ -th monster is in. (Rows are numbered from top to bottom, starting from 0; columns are numbered from left to right, starting from 0.)

### Output

For each test case, output one line containing Case # $x$ :  $y$ , where  $x$  is the test case number (starting from 1) and  $y$  is the the total number of safe zones for this test case.

### Limits

$1 \leq T \leq 20$ .

$(R_i, C_i) \neq (R_j, C_j)$  for  $i \neq j$ . (No two monsters are in the same grid cell.)

$0 \leq R_i < R$ ,  $i$  from 1 to  $K$

$0 \leq C_i < C$ ,  $i$  from 1 to  $K$

### Small dataset

$1 \leq R \leq 10$ .

$1 \leq C \leq 10$ .

$0 \leq K \leq 10$ .

### Large dataset

$1 \leq R \leq 3000$ .

$1 \leq C \leq 3000$ .

$0 \leq K \leq 3000$ .

### Sample

Input	Output
2	Case #1: 10
3 3 1	Case #2: 51
2 1	
4 11 12	
0 1	
0 3	
0 4	
0 10	
1 0	
1 9	
2 0	
2 4	
2 9	
2 10	
3 4	
3 10	

The grid of sample case #1 is:

```
0 0 0
0 0 0
0 1 0
```

Here, 0 represents a cell with no monster, and 1 represents a cell with a monster. It has 10 safe squares: 8 1x1 and 2 2x2.

The grid of sample case #2 is:

```
0 1 0 1 1 0 0 0 0 0 1
1 0 0 0 0 0 0 0 0 1 0
1 0 0 0 1 0 0 0 0 1 1
0 0 0 0 1 0 0 0 0 0 1
```

Note that sample case #2 will only appear in the Large dataset. It has 51 safe squares: 32 1x1, 13 2x2, 5 3x3, and 1 4x4.

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