

# Check Ramsey

From Ramsey theorem we know that for every  $k, l$  pair there exists an integer:  $R(k, l)$  for that if  $n \geq R(k, l)$ , then if you color the edges of a complete graph on  $n$  vertices with red and blue then it contains a complete subgraph on  $k$  vertices whose edges are blue or a complete subgraph on  $l$  vertices whose edges are red. To get an impression of the theorem you have to count the number of complete subgraphs having  $k$  nodes with blue edges -  $K(k)$  and the number of complete subgraphs having  $l$  nodes with red edges -  $K(l)$  for each edge coloring.

To make the problem somewhat easier (or harder?) for each test the probability that an edge is red (or blue) is close to  $1/2$ . This means that on  $n$  vertices you will see about  $n(n-1)/4$  red edges.

## Input

The first line contains the number of test cases  $T$ , where  $T \leq 100$ . After it there is a blank line and also after every test. Each test starts with four integers  $n, k, l, e$  in this order, where  $3 \leq k \leq l \leq n < 100$ , here  $e$  is the number of red edges (we are not interested in very large monochromatic complete subgraphs, so you can assume that  $k, l \leq 10$  is also true). Then follow  $e$  lines, each of them gives two integers:  $x, y$ , it means that there is a red edge between points  $0 \leq x, y < n$ . All other edges are blue.

## Output

For each test print the case number then the count of blue  $K(k)$  and red  $K(l)$  for the edge coloring.

## Example

*Input:*

3

5 3 3 5

0 1

1 2

2 3

3 4

4 0

6 3 3 6

0 1

1 2

2 3

3 4

4 5

5 0

8 3 4 7

0 1

0 2

0 3

0 4

1 2

1 3  
2 3

*Output:*

Case #1:

The number of blue K(3) is 0 and the number of red K(3) is 0.

Case #2:

The number of blue K(3) is 2 and the number of red K(3) is 0.

Case #3:

The number of blue K(3) is 25 and the number of red K(4) is 1.