
Algorithms Lab

Exercise 0 – Count the faces

A *planar graph* is a graph with an embedding in to the plane such that no two edges cross in the embedding. Figure 1 shows a plane embedding of K_4 , with the vertices numbered 1–4.

A *face* of the planar graph is a region of the plane which is bounded by edges. In the figure, the faces are labelled with letters.

Your task is to compute the number of faces, given the graph. The number of faces only depends on the graph, not on the exact embedding.

Input The input is a series of test cases, terminated by EOF.

Each test case starts with the number of vertices $n \leq 10000$ and edges $m \leq 10000$ on a line separated by space. Then there are m lines, one for each edge, consisting of two integers u, v which denote the endpoint of the edge. The vertices are numbered from 1 to n , i.e., $1 \leq u, v \leq n$.

Output For each test case, print a line containing the integer f , which is the number of faces in a planar embedding of the graph.

Sample Input

```
2 1
1 2
4 6
1 2
2 3
1 3
1 4
2 4
3 4
```

Sample Output

```
1
4
```

(100 Points)

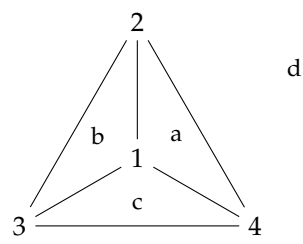


Figure 1: K_4 planar embedding with faces