Christian Schindelhauer   Freiburg, 26.11.2014
                                                         Discussion 02.12.2014

Exercises for the Lecture

Graph Theory

Winter 2014/15

Blatt 3 (15 points)

Task 1:   5 points
Prove Theorem 8: A finite undirected connected graph

1. is Eulerian, if all nodes have even degree.

2. possesses an Eulerian path, if exactly two nodes have odd degree.

Task 2:   5 points

1. Give an algorithm which checks for a given sequence of edges, whether it represents a simple path.

2. Give an algorithm that enumerates all possible simple paths.

3. Give an algorithm which computes for a given undirected graph the longest simple path.

4. Estimate the run-time of your algorithm with respect to the number of nodes n and the number of edges m.

Task 3:   5 points
Prove or disprove:

1. The line graph $L(G)$ of an Eulerian graph G is Hamiltonian.

2. If the line graph $L(G)$ of a graph G is Hamiltonian, then G is Eulerian.