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Pearls of Algorithms
WS 2012/13
Homework 3

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Exercise 1:

Reduce the problem of the computation of a maximum matching in a bipartite undirected graph to the problem of the computation of a maximum flow in a flow network.

Exercise 2:

Let $G = (A, B, E)$ be a bipartite graph. A perfect matching of G is a matching $M \subseteq E$ such that each node in $A \cup B$ is end node of an edge in M.

a) Show that the existence of a perfect matching in G implies $|A| = |B|$.

b) Let w be a function which assigns to each edge $e \in E$ a positive weight $w(e)$. Find an algorithm which constructs a perfect matching M_0 such that $\min_{e \in M_0} w(e) \geq \min_{e \in M} w(e')$ for all perfect matchings M of G.

Exercise 3:

Work out the algorithm Ford-Fulkerson.