Praktikum Diskrete Optimierung

Due date: Monday, 14th May 2012, 12:00

Aufgabe 1 (Algorithm of Goldberg and Tarjan `goldberg`)

Let $G = (V, E)$ be a directed graph such that each edge $e \in E$ has integral capacity $c(e) \in \mathbb{N}$. Two of the nodes of G are named, the first is the source $s \in V$ and the second is the sink $t \in V$, $s \neq t$. Implement and animate the algorithm of Goldberg and Tarjan which computes a maximum flow in the given graph G.

The user should be able to choose source and sink at the beginning. Furthermore, it should be easy for the user to observe on the screen how the algorithm works. In particular, the active nodes should be marked, and each push- and relabel-operation should be vividly animated. In that respect it makes sense to display the excess and distance values of the nodes as labels.

Hints

You can use the directed graphs `flow1.gw` bis `flow4.gw` as inputs for your algorithm. These graphs store the integral capacities of the edges as strings in the user-labels of the edges. If the leftmost node is chosen as the source and the rightmost node as the sink, then the graphs `flow1.gw` to `flow4.gw` have the following maximum flow values: 40, 105, 340 and 50.