

Combinatorial Optimization

Fall 2008

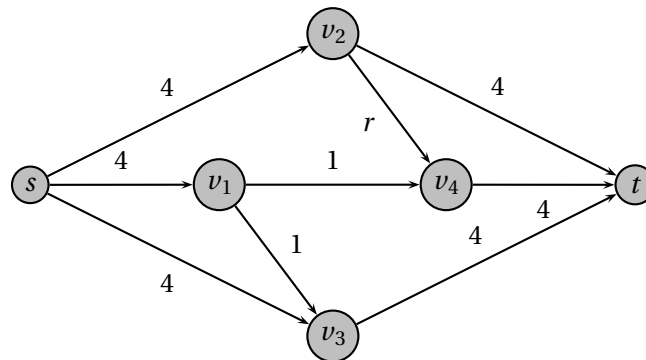
Assignment Sheet 6

Exercise 1 (Ford–Fulkerson algorithm)

Prove that the Ford–Fulkerson algorithm applied on the network with rational capacities terminates.

Exercise 2 (Ford–Fulkerson algorithm)

Show that the Ford–Fulkerson algorithm may not terminate on the following network.

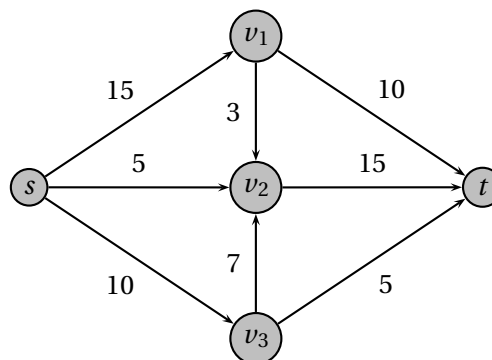


Here r is the positive solution of $r^2 + r - 1 = 0$, i.e., $r = (\sqrt{5} - 1)/2$.

Can we at least guarantee that the algorithm converges to the optimum solution?

Exercise 3 (Ford–Fulkerson algorithm)

Run the Ford–Fulkerson algorithm, to find the maximum s – t -flow in the following network.



Exercise 4 (Cycle-Cancelling Algorithm)

Show that the Cycle-Cancelling algorithm applied on the following network needs $2 \cdot 10^6$ iterations.

