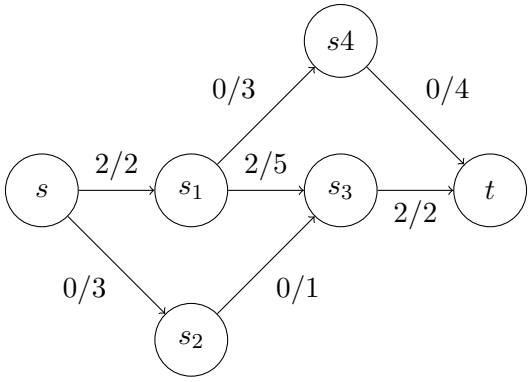
Technische Universität München
Institut für Informatik
Theoretical Computer Science

Fundamental Algorithms 13

Exercise 1 (Ford-Fulkerson)

Consider the following flow network G during the execution of Ford-Fulkerson. The edge labels, written f/c, denote the flow f and capacity c of the respective edge. Draw the residual graph G_f, find an augmenting path, and apply the Ford-Fulkerson operations. Continue this procedure until you identified the maximum flow in G.



Exercise 2 (Marriage)

The *maximum bipartite matching* problem is defined as follows. Given a bipartite graph $((U, V), E)$, i.e. a graph where edges are exclusively between U and V, find a largest set of edges such that no two edges share a vertex. Informally, this can be interpreted as *marriage problem*: The vertex sets represent the males and females of a particular population, edges represent mutual interest. Now, we want to identify the maximum amount of marriages.

Think about how to apply Ford-Fulkerson to solve this problem.