

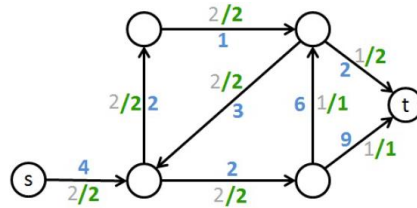
Given two strings $x = x_1x_2 \cdots x_n$ and $y = y_1y_2 \cdots y_m$, we wish to find the length of their *longest common substring*, that is, the largest k for which there are indices i and j with $x_ix_{i+1} \cdots x_{i+k-1} = y_jy_{j+1} \cdots y_{j+k-1}$. Show how to do this in time $O(mn)$.

6.22. Give an $O(nt)$ algorithm for the following task.

Input: A list of n positive integers a_1, a_2, \dots, a_n ; a positive integer t .

Question: Does some subset of the a_i 's add up to t ? (You can use each a_i at most once.)

4. Use the Cycle Canceling algorithm to find a min-cost s, t -flow $0 \leq f \leq c$ of value 2 and minimum cost in the graph below (the green values are the capacities, the gray values are the current flow, and the blue values are the costs). Use the current flow as starting point. Show each of the iterations, including the residual networks.



- 5) Given a directed graph $G=(V,E)$, a subset E' of edges is called a *feedback arc set* if the removal of edges E' makes G acyclic.

The Feedback Arc Set Problem is the following: Given a directed graph G and a number b , decide if there is feedback arc set of size at most b .

Show that this problem is in NP.