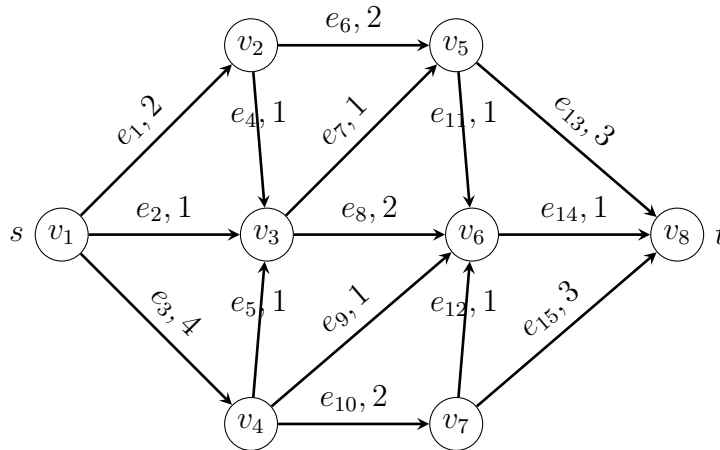


Due Friday, April 11, 2014

Students in section B13 (three credit hours) need to solve any two of the following three problems. Students in section B14 (four credit hours) must solve all three problems.

1. Apply the Ford-Fulkerson algorithm to the following network. On each iteration, list the edges of the augmenting path and θ . Prove that the flow is maximal by finding a minimal cut. The provided worksheet may be helpful.



2. Suppose there are n men and n women and m marriage brokers (labeled c_1, \dots, c_m). Each broker has a list of men and women as clients and can arrange marriages between any pairs of men and women on the list. In addition, we restrict the number of marriages that broker i can arrange to a maximum of b_i . Each man can be married to at most one women and each women can be married to at most one man. Translate the problem of finding a solution with the most marriages into one of finding the maximum flow in a flow network.
3. Using maximum flows, find a maximum matching in the bipartite graph below on the left. Prove that the matching is optimal.

