

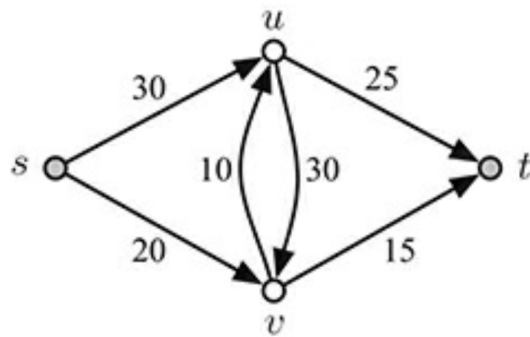
Last name _____

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LARSON—OPER 731—CLASSROOM WORKSHEET 27
Cutting Planes!

Concepts

- (Sec. 3.1) *dual LP, Weak duality theorem.*
- (Sec. 4.3) *complementary slackness, cone, cone of tight constraints.*
- (Sec. 4.4) *Farkas's Lemma.*
- (Sec. 5.1) *primal-dual algorithm.*
- (Sec. 5.3) *directed graph, flow, flow balance, flow value, capacity, totally unimodular matrix, max-flow min-cut.*



1. What is an s - t flow? What is the *value* of a flow?

2. Model the maximum s - t flow problem for this network.

3. Find a maximum flow for this network.

4. Argue that a maximum flow for a network with integer capacities will be integer (have an integer value on each arc).
5. What is an *s-t cut*? What is the *capacity* of an *s-t* cut?
6. Can you find a minimum cut in this network?
7. What is the dual LP for the above LP?
8. Argue that the dual LP has an integer optimum solution.
9. Find a feasible dual solution that proves optimality.
10. What is a *cutting plane*?