

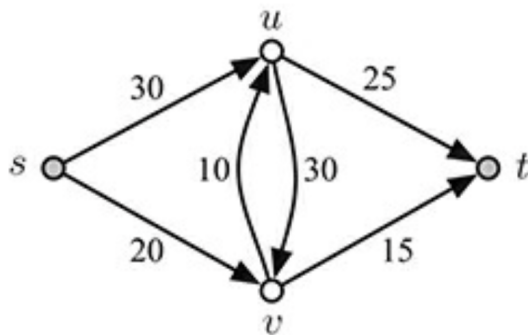
Last name _____

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LARSON—OPER 731—CLASSROOM WORKSHEET 26
Max Flow Min Cut!

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 the dual optimum.

10. What is the connection between this solution and a cut in the network?