CS483 - Practice Problems 5 (Due Nov 17th)
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Chapter 7

1. (5) Problem 1 (Chapter 7) ({s}, {u,v,t}), ({s,v}, {u, t}), ({s,u,v}, {t})) The unique minimum cut is (s, v, u, t), with two edges of capacity 2 going across.
2. (5) Problem 2 (Chapter 7) The flow value is 18. It is not a maximum flow. Define the set A to be s and the top node. The cut $(A, V-A)$ is minimum and has capacity 21.
3. (5) Problem 4 (Chapter 7) False. Consider graph with nodes s, v, w, t and edges $(s, v), (v, w), (w, t)$ capacities of 2 on (s, v) and (w, t) and capacity of 1 on (v, w). Then the maximum flow has value 1 and it does not saturate the edge out of s.
4. (5) Problem 5 (Chapter7) False. Consider graph with nodes S, v_1, v_2, v_3, w, t and edges (s, v_i) and (v_i, w) for each i and an edge (w,t). There is a capacity of 4 on (w, t) and a capacity of 1 on all other edges. Then $A = s$ and $B = V - A$ is the min cut with capacity 3. If we add 1 to every edges then this cut has capacity 6 which is more then cut with $B = t$ and $A = V - B$.