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First name _____

LARSON—OPER 731—HOMEWORK WORKSHEET 11
2 Matroid Problems from our Book.

Here are 2 problems from Lee's book with supplemental comments.

1. Problem, p. 51.

You should work out some examples with small graphs first:

- (a) Let G be a graph.
- (b) Find the graphic matroid M whose independent sets are the forests of G .
- (c) Let A be the vertex-edge incidence matrix of G .
- (d) Let M' be the linear matroid (over the two-element field).
- (e) Now show that M is “really” M' .

After you have convinced yourself that this works for concrete examples, see if you can make a general argument for *any* graph G .

2. Problem, p. 58.

- (a) Clearly specify your matroid. (You will need an explicit ordering for the ground set of your matroid. But do *not* write out all the independent sets—there are far too many).
- (b) Explicitly put in all the steps of the weighted greedy algorithm (and record whether a considered set is an independent set or a dependent set. Keep track of S and U as these evolve.