Last name _____

First name _____

LARSON—MATH 656—CLASSROOM WORKSHEET 14
Stable Matchings.

Organizational Notes

1. Don't forget to send your Notes / Classroom worksheet after each class (make the email subject useful: like "Math 656 c13 notes").
2. The VCU Discrete Math Seminar is every Wednesday.
3. Homework #4 (h04) is due next Monday.
4. Homework #5 (h05) is the Test Review.
5. Test 1 is Monday, Mar. 22.
6. Read ahead! Next up we'll talk about general matching algorithms (Sec. 3.3), Tutte's Theorem and the Gallai-Edmonds Mathcing Decomposition (as described in the West paper).

Concepts & Notation

- Sec. 3.2: maximum bipartite matching algorithm, maximum weighted bipartite matching algorithm, transversal, Assignment Problem, stable matching.
- Sec. 3.3: general (cardinality) matching, Tutte's Theorem, Edmonds-Gallai Decomposition.

Review

1. Given n "men", n "women" and linearly ordered preferences for each, what is an *unstable pair*?

2. Given n "men", n "women" and linearly ordered preferences for each, what is a *stable matching*?

3. Given n "men", n "women" and linearly ordered preferences for each, what is an algorithm for producing a stable matching?

Notes

1. Is this algorithm *biased* (does it produce similar outputs regardless of whether men's or women's preferences are favored)?

2. Why is this algorithm guaranteed to terminate?

3. Why is this algorithm guaranteed to produce a stable matching?

4. What is the problem with applying the idea of Berge's Theorem to finding a maximum matching in a general graph (and why did it work in bipartite graphs)?

5. What is the main idea of Edmond's Blossom Algorithm?

6. What is a Hungarian Tree/Forest with respect to a matching M in a general graph?

7. What is Tutte's Theorem?