Due at the start of class Wednesday, Feb 9, 2011.

**Problem 1.** Run the stable marriage algorithm on the following instance to create a stable marriage. Show all your steps.

**Instance:** There are 4 men, \( m_1, m_2, m_3, m_4 \) and 4 women, \( w_1, w_2, w_3, w_4 \). Following are the preference lists for the 4 men:

- \( m_1 : [w_1, w_2, w_4, w_3] \)
- \( m_2 : [w_1, w_4, w_2, w_3] \)
- \( m_3 : [w_1, w_2, w_3, w_4] \)
- \( m_4 : [w_4, w_3, w_1, w_2] \)

Preference list for the women are as follow:

- \( w_1 : [m_2, m_3, m_1, m_4] \)
- \( w_2 : [m_3, m_1, m_2, m_4] \)
- \( w_3 : [m_4, m_2, m_1, m_3] \)
- \( w_4 : [m_2, m_4, m_1, m_3] \)

**Problem 2.** Give an instance of the stable marriage problem where there are multiple stable marriages. Show at least two different stable marriages and show how you computed them.

**Problem 3.** Compute the GCD of 51 and 136. Show all the steps of Euclid’s algorithm.

**Problem 4.** Research the name “Atanasoff” and discuss his contributions to Computing.

**Problem 5.** Implement a program in Ruby to compute Factorial of \( N \). Factorial\((N)\) for an integer \( N > 0 \), is defined as the product of \( N \cdot (N - 1) \cdot (N - 2) \cdot \ldots \cdot 1 \). You have to run the program on linuxlab and then show us some sample outputs.