Due at the start of class Tuesday, Sep 15, 2009.

**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.** Research the name “Atanasoff” and highlight his contributions to computing.

**Problem 4.** Define the following terms:

- function
- predicate
- guard
- program

**Problem 5.** What is the difference between a function interface and a function implementation?

**Problem 6.** How does the roomba’s function implementation structurally differ from the wifi router’s? Note: we are not looking for the difference in functionality (room cleaner versus network router), but a more basic difference in the way each of these computers are implemented.