CSE 415 - Operating Systems
Homework Assignment #2
Spring 2011 - Prof. Butler
Due date: May 22, 2012

All questions must be done by yourself without outside assistance (with the exception of question 1, as noted below). Use the turnin script, located at

`http://systems.cs.uoregon.edu/apps/turnin.cgi`

to submit your assignment. You may submit either a plain text or a PDF file for the written questions. Don't send Word or OpenOffice files. You should submit a tarfile containing your written solutions and the code that you will write for question 1. Make sure to answer the questions posed, but remember that brevity is the soul of wit: be concise rather than rambling. If we can't understand your answer or it doesn't make sense, you will lose marks.

1. **Threads and Synchronization** (30 pts)
   Write a solution to the producer-consumer problem as shown in question 6.40 in Silberschatz 8/e. Write your code in C using the pthreads library. Do not use the Win32 API. For this question, you may look up online documentation about pthreads, though Chapter 4 of the book and the slides contain all of the API calls that you will need.

2. **Synchronization** (10pts)
   Answer questions 6.10 (prove Eisenburg/McGuire) and 6.12 (spinlocks) in Silbershcatz 8/e.

3. **Deadlock** (20pts)
   Answer questions 7.11 (dining philosophers deadlock), 7.14 (banker's algorithm), 18.4 (expense of distributed vs centralized deadlock), 18.5 (dealing with deadlock in networks) in Silbershcatz 8/e.

4. **Memory Management** (10pts)
   Answer questions 8.12 (supporting dynamic memory allocation) and 8.14 (accessing memory in paging systems) in Silbershcatz 8/e.

Note: Like all assignments in this class **you are prohibited from copying any content from the Internet or sharing ideas, code, configuration, text or anything else or getting help from anyone in or outside of the class, except where noted**. Failure to abide by this requirement will result in sanctions ranging from zero on the assignment to dismissal from the class.