CS590 Homework #3
Due: Tuesday, July 13, 2010

1. Implement a program to solve the dining philosopher's problem using pthreads.

   Five philosophers sit around a circular table.

   Each philosopher spends his life alternatively thinking and eating.

   In the center of the table is a large plate of spaghetti.

   A philosopher needs two chopsticks to eat a helping of spaghetti.

   Unfortunately, as philosophy is not as well paid as computing, the philosophers can only afford five chopsticks.

   One chopstick is placed between each pair of philosophers, and they agree that each will only use the chopstick to his immediate right and left.

   Each philosopher should be modeled as a thread, and each chopstick as a shared resource.

   Your program must be flexible enough to provide to alter the number of chopsticks and philosophers with little effort.

   Your program should also implement techniques to help prevent both deadlock (no philosophers can eat since they are all holding one chopstick), and starvation (some philosophers never get to eat).

2. Modify your shell program from homework #2 to provide support for commands with multiple pipes (i.e. ls | grep cs590 | wc). In addition, you should fix any outstanding deficiencies in your previous shell program.