Name: _____ **Student ID #:** _____

Lab #4: COMP 3000B (Operating Systems)
January 31 & Febuary 2, 2006

Please answer the following questions. All source is in the `threads` directory. All programs can be compiled using the `make` command. **Please shut down your computer when you are done.**

1. (1 pt) The program `threads.c` is a multithreaded producer/consumer program. Unfortunately it consumes faster than it produces, resulting in an error. Why does it not print the same number every time?

2. (2 pts) The program `passstr.c` is a multithreaded program using the *clone* function call. What is wrong with the way this program blocks, waiting for the string to arrive in the buffer?

3. (2 pts) Signals are one method of IPC. Write a program that catches the hangup signal and prints "I've been signalled" when the signal is received. You will need to use the `signal` C function. You can test your program using the `kill` or `killall` command. List your program below.

4. (5 pts) The program `pt.c` is a multithreaded producer/consumer program using pthreads. Use the variables `data->mutex`, `data->notFull` and `data->notEmpty` as well as the functions `pthread_cond_signal`, `pthread_mutex_unlock`, `pthread_mutex_lock` and `pthread_cond_wait` to implement locking. What did you add to the consumer function? What did you add to the producer function?