Ivan Chowdhury

ECE-357: Computer Operating Systems

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Professor Hakner

Problem Set 6 - Synchronization

Problem Set 6 Submission

Problem 1 - TAS and Spin Lock

Program Compilation & Output

```
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ gcc -o spinlocktest spinlocktes
t.c spinlock.c tas64.S
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ ./spinlocktest
Ideal Count: 20000000
Count [No Mutex Protection]: 8562043
Count [Mutex Protection]: 20000000
```

Problem 4 - Test your FIFO

Program Output

Scenario 1 - 50 Iterations, 1 Writer

```
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ gcc -o fifotest fifotest.c fifo
.c sem.c spinlock.c tas64.S
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ ./fifotest
Success: All of the data sent by the writer process was received by the reader p
rocess
```

Program indicates that all of the sent data was received through the FIFO.

Scenario 2 - 10000 Iterations, 1 Writer

```
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ ./fifotest
Success: All of the data sent by the writer process was received by the reader p
rocess
```

The FIFO implementation also works for larger iterations

Scenario 3 - 1000 Iterations, with a flaw in the implementation (order of lock and unlock was changed in sem_inc)

```
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ gcc -o fifotest fifotest.c fifo
.c sem.c spinlock.c tas64.S
ubuntu@ubuntu:~/Documents/Source Code/osprog/p6$ ./fifotest
```

The program hangs indefinitely; it is broken.