Exercises

1. Recall that the user character 0 runs from a chasing character * in the program `chase.C` (from the `Public/os/demo_thread` directory). Explain what you would need to do the program so that it had two chasers. You don’t need to code it - just describe what to do.

2. Suppose that day, month, and year are shared global variables, and daysInMonth is an array storing the number of days in each month. Here is code to change to the next day:

   ```c
   void next_day() {
       day++;  
       if (day > daysInMonth[month]) {
           day = 1;
           month++;
           if (month > 12) {
               month = 1;
               year++;
           }
       }
   }
   ```

   Suppose the variables are day=31, month=12, year=2015, and two threads run `next_day()` simultaneously. What are the possible results of this computation?

3. Explain why spinlocks are never appropriate for uniprocessor systems.

4. Using an atomic TSL instruction, entry to a spinlock can be achieved with `while(TSL(lock));` Some processors provide an atomic `SWP(lock)` instruction, which swaps the contents of a register with the memory location `lock`. Show how to use atomic `SWP` instead of `TSL` for a spinlock.