ITBU 373, Operating Systems Homework 23

Chapter 29, *Operating Systems, Three Easy Pieces*

Readings

Read chapter 29 in the *Operating Systems, Three Easy Pieces* book.

Discussion Questions

Answer the discussion questions in writing.

1. What does it mean to say that a data structure is *thread safe*?
2. Read the listing for the `A Counter With Locks` and explain the functions `increment()`, `decrement()`, and `get()`
3. Looking at the chart in Figure 29,3, we see that the precise algorithm does not scale. Why is this so?
4. How does the *approximate counter* work? Why is it more scalable than the precise counter?
5. Your grandmother has heard people talking about something called a "linked list" but she does not understand it. Explain it to her. (I replaced this question with one asking you for the pseudo-code for a linked list.)
6. What is *hand-over-hand locking*?
7. How does a concurrent queue work?
8. Explain how the hash table in Figure 29.10 works. Note that it does not contain a hashing function, like, for example, MD5 or SHA256. What's going on here, and why is it called a hash?
9. Why does Donald Knuth say that "premature optimization is the root of all evil?"