CPSC 3125, Operating Systems Homework 25

Chapter 31, *Operating Systems, Three Easy Pieces*

Readings

Read chapter 32 in the *Operating Systems, Three Easy Pieces* book.

Discussion Questions

Answer the discussion questions in writing.

1. What is a *semaphore*, in the context of threading?
2. What are the arguments to `sem_wait()`? What is the return value? What does it do?
3. What are the arguments to `sem_post()`? What is the return value? What does it do?
4. What are the arguments to `sem_trywait()`? What is the return value? What does it do?
5. What are the arguments to `sem_init()`? What is the return value? What does it do?
6. "[T]he value of the semaphore, when negative, is equal to the number of waiting threads." Explain this statement and show why it is true.
7. Look at Figure 31.2 (page 368). For `sem_wait()` when does the function return assuming the value of `semaphore` is < 0? For `sem_post()` when does the function return assuming the value of `semaphore` is ≥ 1?
8. How can we use a *binary semaphore* as a lock?
9. How can a semaphore be used to mimic a condition variable?
10. In your own words, summarize Dijkstra's solution to the Dining Philosophers Problem.

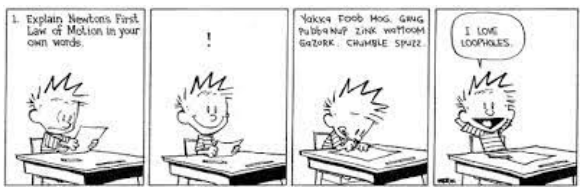

Figure 1: In Your Own Words