Chapters 6 & 7 Objectives

Questions may be asked in class, on quizzes, and on exams

Be able to:

* + briefly explain the concepts of concurrency and synchronization and how they contribute to Operating System actions
  + briefly explain what a race condition is, and provide an example
  + The aim is to describe the output of a system or process showing an unpredictable and fatal dependence on the order of events relative to time.
  + The two signals try to compete with each other to influence who outputs first.
  + what the three parts of a solution to the critical section problem, and briefly explain each
  + 1) Mutual Exclusion：A mutex is a special type of binary semaphore used to control access to a Shared resource.
  + It includes a priority inheritance mechanism to avoid the problem of extended priority inversion.
  + No more than one process can execute at a time in its critical section.
  + 2) Process solution ：This solution is used when no one is in the critical part that someone wants.
  + Then, those processes that are not part of their reminder should have a limited amount of time to decide who should get in.
  + 3)Bound waiting：When a process requests access to a critical region, there is a specific limit on the number of processes that can access the critical region.
  + Therefore, when this limit is reached, the system must allow requests to a process into its critical section.
  + given the code, show the results of implementing Peterson’s solution in a specific situation
  + given the code, show the results of implementing Dekker’s solution in a specific situation
  + explain how the book’s test and set model works and why it must work as an atomic process
  + explain or show in code how a mutex lock might be used to protect a critical section
  + explain or show in code how a semaphore locking system might be used to protect a critical section
  + given a small number of processes that incorporate either mutex or semaphore locking systems, show how, if possible, the processes might support successful process completion
  + explain deadlock and provide a representative example that may or may not be related to a computing system
  + briefly explain the bounded buffer problem; describe some real-world condition that would represent this problem
  + briefly explain the Readers-Writers problem; describe some real-world condition that would represent this problem
  + briefly explain the Dining Philosophers problem; describe some other real-world condition that would represent this problem
  + Exercises
    - Exercises: 6.6, 6.7, 6.8, 6.13, 7.3, 7.4, 7.11