

Computer Operating Systems

Problem #1

Define a process, explain what "process state" is. A process may be in one of the 5 states. Name and describe them. Describe transitions between these states. Explain what context switch is. Describe what state transition involves context switch and why.

Problem #2

Explain why operating system design needs the concept of synchronization primitives, such as semaphores. Explain the operation of the two semaphore operations: wait() and signal(). Define the critical section (mutual exclusion) problem. Provide a semaphore-based solution (write code) to the critical section problem.

Problem #3

Introduce the concept of RAID as a mechanism to use hard disk space redundancy to counteract failure. Describe striping and mirroring as techniques. Explain what parity is and how it is used. Differentiate RAID levels 4 and 5. Explain their relative advantages and disadvantages.