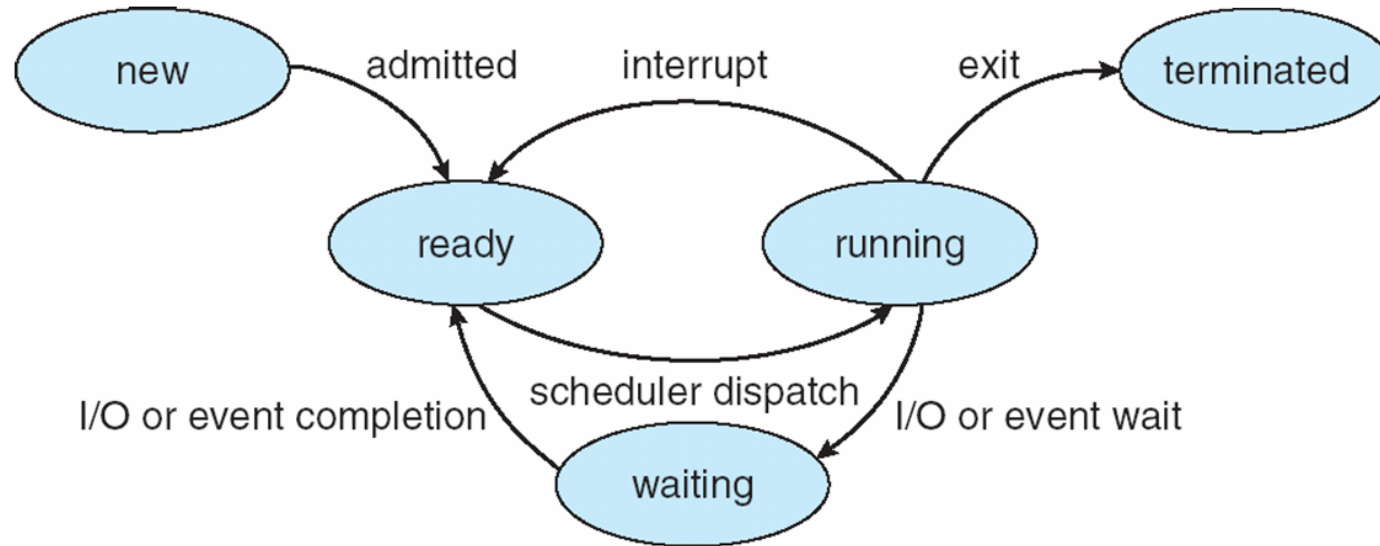


Final Exam Review

Covered Topics

- Chapter 5: Process Synchronization
- Chapter 6: CPU scheduling
- Chapter 8: Main Memory + Chapter 9: Virtual Memory
- Quiz 3

Diagram of Process State



Synchronization

- Concepts
 - Mutual Exclusion
 - Critical sections
 - Race conditions
 - Semaphores
 - Mutex Locks and Condition Variables
 - Interprocess communication
 - Atomic Transaction and Monitors
- Implementations (Know pseudocode for these!)
 - Producers Consumers with Semaphores
 - Readers Writers with Semaphores

Deadlock

- Know how to draw a resource allocation graph.
 - Be sure to label multiple requests for the same resource on the exam.
- Know the conditions for deadlock
 - Circular wait
 - Hold and wait
 - Mutual Exclusion
 - No preemption
- Know the Dining Philosophers example of deadlock and at least one programmatic way to fix it by preventing deadlock.

Handling Deadlock

- Prevention – ensure Deadlock does not exist by removing one of the four conditions for deadlock.
- Avoidance – Utilize the Banker's algorithm to ensure a safe state exists before allowing processes to proceed.
- Detect and Recover – Allow deadlock to occur, but use a heuristic or algorithm to detect it, then if a deadlock has occurred, then use a graph algorithm to determine which processes are in a circular wait, and rollback to a safe state.
- Ignore Deadlock – Ignore deadlock and require the user or system administrator to either kill off processes or reset the system.

CPU Scheduling

- Know scheduling policies
 - FCFS – First Come First Served
 - SJF – Shortest Job First
 - SRTN – Shortest Remaining Time Next
 - RR – Round Robin
- Know that others exist too (Dynamic/RT scheduling)
- Know about CPU Bursts, Time Slices, and how the Scheduler works with the Ready and Run States

Memory Management

- Partitions
- Contiguous vs Non-contiguous allocation
 - Frames
 - Pages
 - Segments
 - Fragmentation
- Process address space
- Swapping memory
- Virtual Memory

Paged Memory

- Paging policy
 - Fetch
 - Demand
 - Prepaging
- Replacement Policies
 - LRU
 - FIFO
 - Optimal

Exam date, time, and place

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