Scheduling

- The scheduler executes the following:
  - Look at the ready list
  - Decide which process to run
- The dispatcher executes the following:
  - Switch context
  - Load the instruction pointer with the appropriate value

Scheduling Algorithm: First Come, First Served

- The ready list is a FIFO queue
  - New processes are added to the back of the queue
  - When the CPU becomes free the process at the front of the queue is selected for execution

Scheduling Algorithm: Shortest Job First

- The scheduler attempts to calculate the length of the next CPU-burst for each process on the ready list
- The process with the shortest CPU-burst is selected for execution

Scheduling Algorithm: Priority Scheduling

- Most important job first:
  - Processes on the ready list are allocated a priority
  - When the CPU becomes free the process with the highest priority is selected for execution

Scheduling Algorithm: Round-Robin Scheduling

- Used in time-sharing
  - Each process is allocated a slice of time with the processor
  - The ready list is a FIFO queue and when the CPU becomes free the process at the front of the queue is selected for execution
  - If the time slice for an executing process expires before the process blocks or terminates then the process is removed from the CPU and placed at the back of the ready queue

Multilevel Scheduling

- Multiple ready lists are maintained containing processes with different properties or requirements
- Different scheduling algorithms can be applied to the different lists
- The scheduler chooses between the lists usually on either:
  - A priority basis
  - A time-sharing basis

Other Types of Scheduling

- Real-time Scheduling:
  - Priority scheduling
  - Deadline scheduling
- Distributed Systems Scheduling:
  - Tightly-coupled microprocessors:
    - Master-Slave scheduling
    - Symmetric Multiprocessing
  - Loosely-coupled processors:
    - Load Balancing

Scheduling in UNIX

- UNIX CPU Scheduling is:
  - Multilevel
    - Multiple ready lists maintained containing processes of different priorities
  - Round-Robin
    - All processes allocated a time-slice
    - The scheduler searches the lists (highest-priority first) to find a process that needs executing