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Chapter 3B – Process Scheduling

Spring 2023

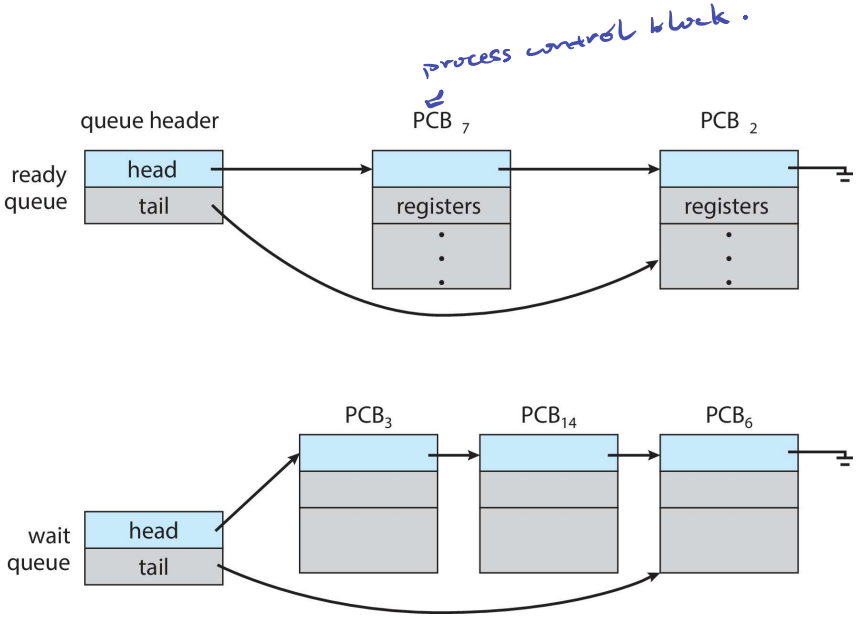
Process Scheduling

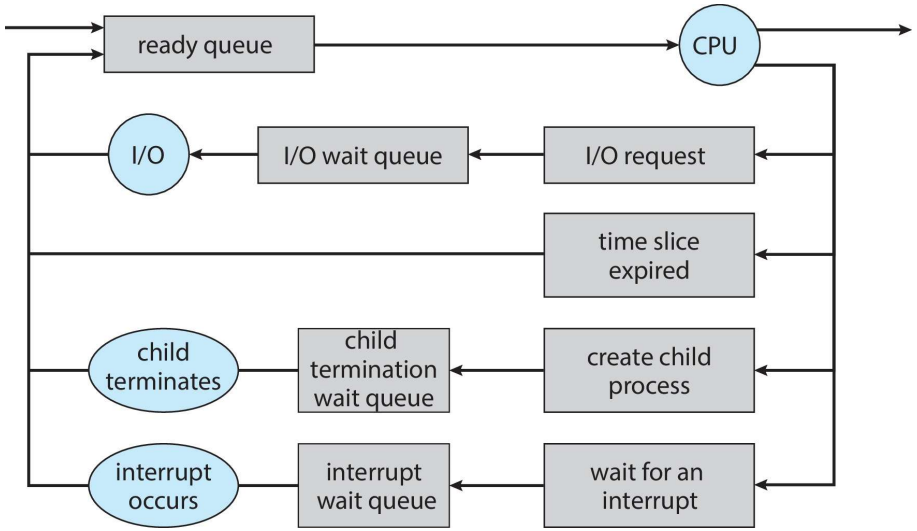
- Scheduling Queues
- CPU Scheduling
- Context Switch

Scheduling Queues

- **Process scheduler** selects among available processes for next execution on CPU core
- Goal – Maximize CPU use, quickly switch processes onto CPU core
- Maintains **scheduling queues** of processes
  - **Ready queue** – set of all processes residing in main memory, ready and waiting to execute
  - **Wait queues** – set of processes waiting for an event (i.e., I/O)
  - Processes migrate among the various queues

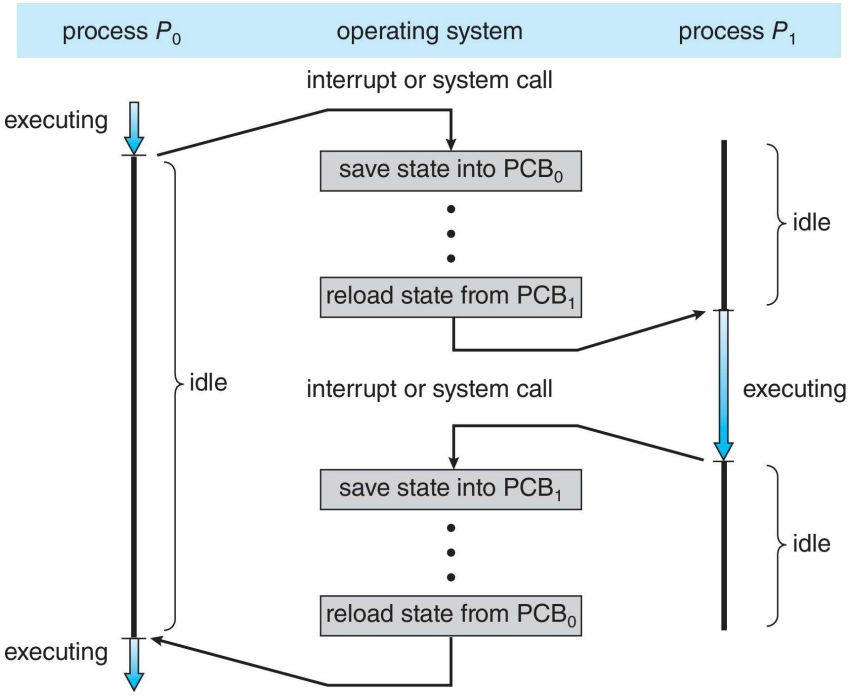
Scheduling Queues





CPU Scheduling

- A **context switch** occurs when the CPU switches from one process to another.



Context Switch

- When CPU switches to another process, the system must **save the state** of the old process and load the **saved state** for the new process via a **context switch**
- **Context** of a process represented in the PCB
- Context-switch time is pure overhead; the system does no useful work while switching
  - The more complex the OS and the PCB, the longer the context switch
- Time dependent on hardware support
  - Some hardware provides multiple sets of registers per CPU so multiple contexts loaded at once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