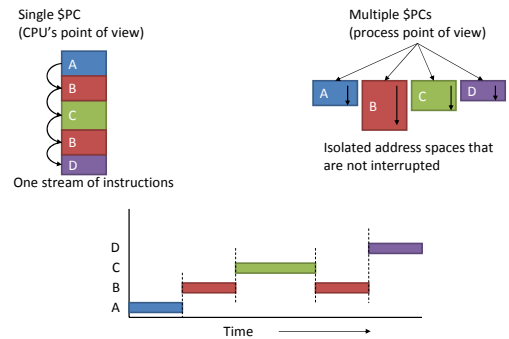


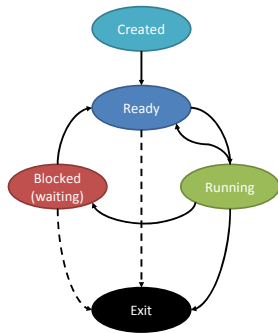
# CS 449 - Threads

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## Multiprogramming



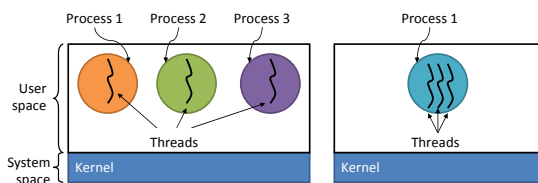
## Life Cycle of a Process



## Thread

A stream of instructions and their associated state

## Processes and Threads

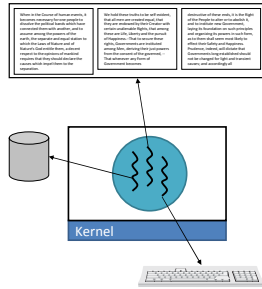


## Thread State

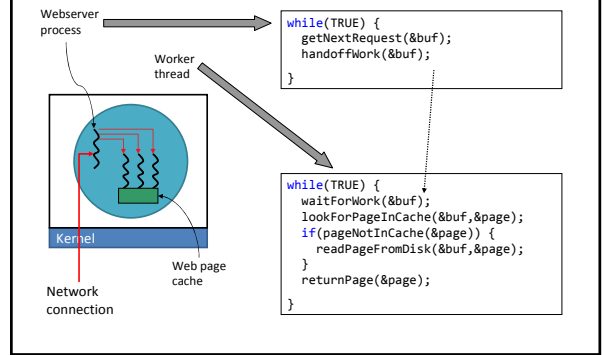
- Per process items**
- Address space
  - Open files
  - Child processes
  - Signals & handlers
  - Accounting info
  - Global variables

Per thread items	Per thread items	Per thread items
Program counter	Program counter	Program counter
Registers	Registers	Registers
Stack & stack pointer	Stack & stack pointer	Stack & stack pointer
State	State	State

# Multithreading in Action



# Multithreaded Webserver



# User Threads vs. Kernel Threads

