Computer Science 22: Object Oriented Programming

Lecture #15: Concurrency

In This Lecture

- Multitasking
- Threads
  - Four States
  - Priority of Threads
- Threads Demo

Multitasking

- Performing two or more tasks at the same time
  - **Process-based multitasking**
    - Two or more programs run in parallel (or **concurrently**)
  - **Thread-based multitasking**
    - One program that performs two or more tasks at the same time
- The goal of multitasking is to utilize the idle time of the CPU

Thread

- A thread is part of a program that is running
- In thread-based multitasking, multiple threads (multiple parts of one program) run concurrently
- Each thread executes independently of each other
- Threads are processed asynchronously

Four States of a Thread

- Running
  - A thread is being executed
- Suspended
  - Execution is paused and can be resumed where it left off
- Blocked
  - A resource cannot be accessed because it is being used by another thread
- Terminated
  - Execution is stopped and cannot be resumed

On Priorities

- Some threads are more important than other threads
- Each thread is given priorities
- Thread priorities are used to decide the order by which threads access resources such as CPU

THREADS DEMO