Thread Synchronization

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CMPT166
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Quiz 5

- Name and describe two examples of component architectures. What are the components? What are the interfaces between components? [6]
- Contrast TCP with UDP. Give an example application appropriate to each. [6]
- Name and describe in words three of the five states in which a thread can be. [4]
- Tell me everything you know about task schedulers. [4]

Quiz 6: answers #1-2

- Name and describe two examples of component architectures.
  - JavaBeans, ActiveX/VB, plugins (Firefox, Apache), Zope/ZCA, Rails, hardware ....
- Contrast TCP with UDP.
  - TCP: connection-oriented, more overhead
    - e.g., web pages, downloading a file
  - UDP: connectionless, no guarantee of delivery, packets may arrive out of order or duplicated
    - e.g., streaming media, real-time stock ticker

Quiz 5: answers #3-4

- Name and describe in words three of the five states in which a thread can be.
  - New, runnable, waiting, timed wait, terminated
- Tell me everything you know about task schedulers.
  - Decides what thread gets the CPU: may preempt currently running thread to give CPU to another thread with higher priority, prevent starvation

Thread synchronization

- Threads are run by the Executor
- If two threads wish to modify a shared object, we need synchronization
  - Mutual exclusion (mutex): only one thread accesses shared object at a time
  - Locks: a way to implement mutex
    - Thread asks for lock before modifying object
    - If it gets the lock, it can modify
    - If not, wait (block) until the lock is freed
    - Free the lock when done modifying

Lock interface

- Any object can be a lock if it implements Lock
    - In package java.util.concurrent.locks
  - Two methods: .lock() and .unlock()
    - .lock() will wait until the lock is freed
    - If many threads are waiting, which one gets it first?
- ReentrantLock: can set fairness policy
  - Longest-waiting thread gets the lock first
- Deadlock happens when each thread is waiting on a lock held by another thread