

# CS314: Lecture Note (Lecture #16, March 12, 2024)

## 1. Ask students to come forward and pick up:

- Attendance card

## 2. Announcements:

- Quiz #7 is scheduled on March 14th (Thursday) after the spring break

## 3. Threads (AKA, “light-weight processes”)

- The kernel-mode threads (Windows) and the user-mode (UNIX pthread) threads
- Disadvantages in using threads

## 4. Introducing Project #2 (may be moved to 3/14)

- thread synchronization
- interrupt and interrupt handler
- The essential system/library calls for Project #2:

### I. Thread (pthread)

- (a) ***pthread\_create***: create a new thread

### II. Interrupt handler (for your user-defined thread scheduler)

- (a) ***signal*** (for “SIGALRM” interrupt code)
- (b) ***alarm***

### III. pthread mutex variables

- (a) ***pthread\_mutex\_init***
- (b) ***pthread\_mutex\_lock***: the “wait” operation for a semaphore for processes
- (c) ***pthread\_mutex\_unlock***: the “signal” operation for a semaphore for processes

### IV. pthread conditional variables

- (a) ***pthread\_cond\_init***
- (b) ***pthread\_cond\_signal***

## 5. Midterm-exam review

- QUESTION #4 and #5