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CS 415

ASG5

Q1:

Make a latch class: (Not sure how to test this)

```
// Devin Hardy
// Asg 5
// Latch class construction

#include <iostream>
#include <random>
#include <thread>
#include <mutex>
#include <atomic>


//Heavy references to
// https://codereview.stackexchange.com/questions/269342/implementation-of-a-latch
// https://en.cppreference.com/w/cpp/thread/latch
//
class latch {
    // needs a counter
    std::atomic<unsigned int> myCounter;
    mutable std::mutex mLock;

public:
    latch(unsigned int value) { myCounter = value; }
    ~latch();
    void count_down(unsigned int amtToDecrement) {
        myCounter -= amtToDecrement;
    }
    bool try_wait() {
        return !myCounter;
    }
    // From my understanding
    // returns if counter is already zero
    // locks the mutex until it leaves the function
    void wait() const {
        if (!myCounter) return;
        std::lock_guard<std::mutex> lock(mLock);
        while (myCounter);
    }
    void arrive_and_wait(unsigned int amtToDecrement) {
        count_down(amtToDecrement);
        wait();
    }
};
```

```c
int main()
{
    return 0;
}
```