Lab #14
CSCI 201

Title
Sleeping Barber with Blocking Queue

Lecture Topics Emphasized
Sleeping Barber
Locks and Conditions
Producer/Consumer
Multi-Threaded Programming Design

Introduction
The Sleeping Barber problem is a famous concurrency problem that deals with multiple customers (independent threads) with a single barber (shared resource). If the barber has no customers, he will go to sleep, requiring the next customer who enters to wake him up. If the barber is currently cutting a customer’s hair, the customer will have to wait for the barber to finish. If there are too many customers already waiting, the new customer will leave. For this lab, you will create this application.

Description
You learned about the Sleeping Barber problem in class, and there is a solution to the problem already posted on the Lectures page. For this lab, you are going to modify this solution to use blocking queues instead of an ArrayList with locks and conditions. Although there is not much code to modify for this lab, the logic is extremely important. You should make sure to spend time understanding the existing code, and run it multiple times to make sure that you completely understand how it is working and when different sections are executed.

In addition to the blocking queue, you will display all of the output through a browser instead of solely through the command line. That means you will need to modify the code to make it a servlet instead of a standalone Java program. The output can be as aesthetic as you want, but just make sure each of the print statements from the standalone program are output through a browser. Most likely this will require AJAX connecting to a servlet with the program running on the server, starting when the page loads.

With 10 customers (as provided in the existing code), the program will eventually end.

Grading Criteria
Labs are not graded based on any given criteria but are instead graded on effort and attendance. If you arrived to lab within the first 10 minutes and worked on it the for the entire duration of the lab, you will receive full credit regardless of whether you completed it. TAs will not grade labs until after at least half the lab period has elapsed. Use the lab time as an opportunity to more fully understand the course material and ask your TA questions.