The Barbershop program simulates a barber shop with a set number of barbers and customers by utilizing Semaphores and mutexes. It begins with the command line. The program accepts 2 command line arguments: sleepTime and numBarbers. After these inputs are provided, no more user input is needed. The program then calculates the number of waiting chairs based off the number of barbers multiplied by 2. Then the number of customers is calculated by taking the number of barbers + number of waiting chairs. Then the program initializes the waiting room and barber semaphores, then the waiting room and barber mutexes. Then a for loop begins to create customer threads and start them.

This leads into the Customer class. Here each customer is given a unique id to distinguish them from other customers. Then 2 variables are initialized to keep track of the number of customers in the waiting room, then the number of customers with the barbers. Finally a generator was made to generate random numbers. Then the getWait method is run a if statement utilizes the Swait.tryAcquire() method to check if there is room in the waiting room. If there is room then the customer is able to sit down, if not the customer leaves. Using the Mwait.acquire() and Mwait.release() we are able to increment the waitNum without having interference from other processes. Then the getBarberChair() is called and attempts to acquire a customer. If successful it sends the customer to the barber chair and releases the Swait semaphore. Then it uses the Mbarber and Mwait mutexes to insure the number of customers in the barber increases and the number of people in the waiting room decreases accordingly.

Finally the exit() method is what releases the barber and wait room semaphores and causes the customer to leave.