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devi@Devi: ~/os_lab/Lab9
devi@Devi:~/os_lab/Lab9$ gcc -o sleepingbarber sleepingbarber.c -lpthread
devi@Devi:~/os_lab/Lab9$ ./sleepingbarber
bash: ./sleepingbarber: No such file or directory
devi@Devi:~/os_lab/Lab9$ gcc -o sleepingbarber sleepingbarber.c -lpthread
devi@Devi:~/os_lab/Lab9$ ./sleepingbarber
Maximum number of customers can only be 25. Enter number of customers and chairs.
12
5
A solution to the sleeping barber problem using semaphores.
The barber is sleeping
Customer 0 leaving for barber shop.
Customer 1 leaving for barber shop.
Customer 2 leaving for barber shop.
Customer 3 leaving for barber shop.
Customer 4 leaving for barber shop.
Customer 5 leaving for barber shop.
Customer 6 leaving for barber shop.
Customer 8 leaving for barber shop.
Customer 9 leaving for barber shop.
Customer 7 leaving for barber shop.
Customer 10 leaving for barber shop.
Customer 11 leaving for barber shop.
Customer 5 arrived at barber shop.
Customer 5 entering waiting room.
Customer 5 waking the barber.
Customer 9 arrived at barber shop.
Customer 9 entering waiting room.
Customer 0 arrived at barber shop.
Customer 0 entering waiting room.
Customer 6 arrived at barber shop.
Customer 6 entering waiting room.
Customer 8 arrived at barber shop.
Customer 8 entering waiting room.
The barber is cutting hair.
Customer 2 arrived at barber shop.
Customer 2 entering waiting room.
Customer 3 arrived at barber shop.
Customer 4 arrived at barber shop.
Customer 1 arrived at barber shop.
Customer 7 arrived at barber shop.
Customer 10 arrived at barber shop.
Customer 11 arrived at barber shop.
The barber has finished cutting hair.
The barber is sleeping
Customer 5 leaving barber shop.
Customer 9 waking the barber.
Customer 3 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
```

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devi@Devi:~/os_lab/Lab9
Customer 5 waking the barber.
Customer 9 arrived at barber shop.
Customer 9 entering waiting room.
Customer 0 arrived at barber shop.
Customer 0 entering waiting room.
Customer 6 arrived at barber shop.
Customer 6 entering waiting room.
Customer 8 arrived at barber shop.
Customer 8 entering waiting room.
The barber is cutting hair.
Customer 2 arrived at barber shop.
Customer 2 entering waiting room.
Customer 3 arrived at barber shop.
Customer 4 arrived at barber shop.
Customer 1 arrived at barber shop.
Customer 7 arrived at barber shop.
Customer 10 arrived at barber shop.
Customer 11 arrived at barber shop.
The barber has finished cutting hair.
The barber is sleeping
Customer 5 leaving barber shop.
Customer 9 waking the barber.
Customer 3 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 9 leaving barber shop.
Customer 0 waking the barber.
Customer 4 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 0 leaving barber shop.
Customer 6 waking the barber.
Customer 1 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 6 leaving barber shop.
Customer 8 waking the barber.
Customer 7 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 8 leaving barber shop.
Customer 2 waking the barber.
The barber is cutting hair.
Customer 10 entering waiting room.
The barber has finished cutting hair.
The barber is sleeping
```

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devil@Devil: ~/os_lab/Lab9
Customer 5 leaving barber shop.
Customer 9 waking the barber.
Customer 3 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 9 leaving barber shop.
Customer 0 waking the barber.
Customer 4 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 0 leaving barber shop.
Customer 6 waking the barber.
Customer 1 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 6 leaving barber shop.
Customer 8 waking the barber.
Customer 7 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 8 leaving barber shop.
Customer 2 waking the barber.
The barber is cutting hair.
Customer 10 entering waiting room.
The barber has finished cutting hair.
The barber is sleeping
Customer 2 leaving barber shop.
Customer 3 waking the barber.
Customer 11 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 3 leaving barber shop.
Customer 4 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 4 leaving barber shop.
Customer 1 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
Customer 1 leaving barber shop.
The barber is sleeping
Customer 7 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.

devil@Devil: ~/os_lab/Lab9
Customer 1 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 6 leaving barber shop.
Customer 8 waking the barber.
Customer 7 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 8 leaving barber shop.
Customer 2 waking the barber.
The barber is cutting hair.
Customer 10 entering waiting room.
The barber has finished cutting hair.
The barber is sleeping
Customer 2 leaving barber shop.
Customer 3 waking the barber.
Customer 11 entering waiting room.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 3 leaving barber shop.
Customer 4 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 4 leaving barber shop.
Customer 1 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
Customer 1 leaving barber shop.
The barber is sleeping
Customer 7 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 7 leaving barber shop.
Customer 10 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 10 leaving barber shop.
Customer 11 waking the barber.
The barber is cutting hair.
The barber has finished cutting hair.
The barber is sleeping
Customer 11 leaving barber shop.
The barber is going home for the day.
devil@devil: ~/os_lab/Lab9
```

In this code, the customers and the barber are implemented as separate threads. The customer() function represents the behavior of a customer thread, and the barber() function represents the behavior of the barber thread. The main function initializes the semaphores and creates the barber and customer threads based on the user input for the number of customers and chairs. The pthread_create() function is used to create the threads, and the pthread_join() function is used to wait for the threads to finish. The customer thread simulates a customer arriving at the barber shop, entering the waiting room, waiting for the barber chair to become available, waking up the barber, waiting for the barber to finish cutting hair, and finally leaving the barber shop. The barber thread simulates the behavior of the barber, who sleeps until a customer arrives and wakes him up. The barber then cuts the customer's hair for a random amount of time and repeats the process until there are no more customers.

QUEUE:

Here's a generalized explanation of the order in which the customers are processed:

1. The customers arrive at the barber shop in a random order.
2. Each customer enters the waiting room (`sem_wait(&waitingRoom)`), and if there is space available, they proceed to the next step. Otherwise, they wait until there is an empty chair.
3. The customer acquires the barber chair (`sem_wait(&barberChair)`) and releases their spot in the waiting room (`sem_post(&waitingRoom)`).
4. The customer wakes up the barber (`sem_post(&barberPillow)`), indicating that they are ready to have their hair cut.
5. The customer waits for the barber to finish cutting their hair (`sem_wait(&seatBelt)`). This step ensures that the customer remains in the chair until the haircut is complete.
6. After the haircut is finished, the customer leaves the barber chair (`sem_post(&barberChair)`), indicating that the chair is available again.
7. The customer leaves the barber shop.

The barber thread sleeps until a customer arrives (`sem_wait(&barberPillow)`). When awakened, the barber cuts the customer's hair for a random amount of time and releases the customer (`sem_post(&seatBelt)`). The barber then repeats the process of sleeping and cutting hair until there are no more customers (`allDone` flag is set).