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**GitHub Link:** **https: //github.com/sharmamayank1/mayank.git**

1. A barbershop consists of a waiting room with n chairs and a barber room with one barber chair. If there are no customers to be served, the barber goes to sleep. If a customer enters the barbershop and all chairs are occupied, then the customer leaves the shop. If the barber is busy but chairs are available, then the customer sits in one of the free chairs. If the barber is asleep, the customer wakes up the barber. Write a program to coordinate the barber and the customers.

// shared data

semaphore customers = 0; semaphore barbers = 0; semaphore cutting = 0; semaphore mutex = 1;

int customer1 = 0;

void barber() {

while(true) {

wait(customers); //sleep when there are no waiting customers wait(mutex); //mutex for accessing customers1 customers1 = customers1 - 1;

signal(barbers); signal(mutex); cut\_hair();

}

}

void customer() {

wait(mutex); //mutex for accessing customers1 if (customers1 < n) {

customers1 = customers1 + 1; signal(customers); signal(mutex);

wait(barbers); //wait for available barbers get\_haircut();

}

else {//do nothing (leave) when all chairs are used. signal(mutex);

}

}

cut\_hair(){

waiting(cutting);

}

get\_haircut(){

get hair cut for some time; signal(cutting);

}