// A C PROGRAM TO IMPLEMENT THE BARBER SHOP PROBLEM USING SEMAPHORES

#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>
#define seats 6

void *customerMaker();
void *barberShop();
void *waitingRoom();
void checkQueue();

pthread_mutex_t queue_mutex = PTHREAD_MUTEX_INITIALIZER;

int returnTime=5, current=0;

int main()
{
    pthread_t barber,customerM;
    pthread_create(&customerM,0,customerMaker,NULL);
    pthread_create(&barber,0,barberShop,NULL);
    while(1);
}

void *customerMaker()
{
    int i=0;
    pthread_t customer[seats];
    while(i<(seats))
    {
        i++;
        sleep(1);
        pthread_create(&customer[seats],0,waitingRoom,NULL);
    }
}

void *waitingRoom()
{
    pthread_mutex_lock(&queue_mutex);
    checkQueue();
    sleep(returnTime);
    waitingRoom();
}

void *barberShop()
{
    printf("The barber has opened the store.\n");
    while(1)
    {
        if(current==0)
        {
            printf("\tThe shop is empty, barber is sleeping.\n");
            printf("\tCustomer has arrived, customer wakes him.\n");
            current++;
        }
        else
        {
            printf("\tBarber is busy.\n");
            current--;
        }
        sleep(1);
    }
}

void checkQueue()
{
    // Check the queue
    // and perform necessary actions
}

}  
else  
{   
    printf("\t\t\tBarber begins cutting hair.\n");  
sleep(1);  
current--;  
printf("\t\t\tHair cut complete, customer leaving store.\n");  
}  
}  

void checkQueue()  
{  
current++;  
printf("\tCustomer has arrived in the waiting room.\t\t\t\t\t%d
Customers in store.\n",current);  
printf("\t\tCustomer checking chairs.\n");  
if(current<seats)  
{   
    printf("\t\tCustomer takes a seat.\n");  
pthread_mutex_unlock(&queue_mutex);  
return;  
}  
if(current>=seats)  
{   
    printf("\t\tAll chairs full, leaving store.\n");  
current--;  
pthread_mutex_unlock(&queue_mutex);  
return;  
}  
}