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```c
//  Created by Ayoola Etiko on 2020-05-25.
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//

#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <limits.h>
#include <time.h>
#include <pthread.h>
#include <semaphore.h>

typedef struct car{
    char myName[25];
    int myDir;
    int myArrive;
    int myDur;
    int myIndex;
} car;


static sem_t bridge[10];
static sem_t indexLock;
static sem_t dirLock;
static sem_t tLock;

int ind;
int direction;
int t;
int numCars;

void * routeTaken(void * cur);
car * carInit(char * nameIn, int dirIn, int arriveIn, int durationIn);

int main(){
    ind = 0;
    direction = -1;
    numCars = 0;
    t = 0;
    int i;
    int j;
    for(i=0;i<10;i++){
        sem_init(bridge+i, 0, 0);
    }

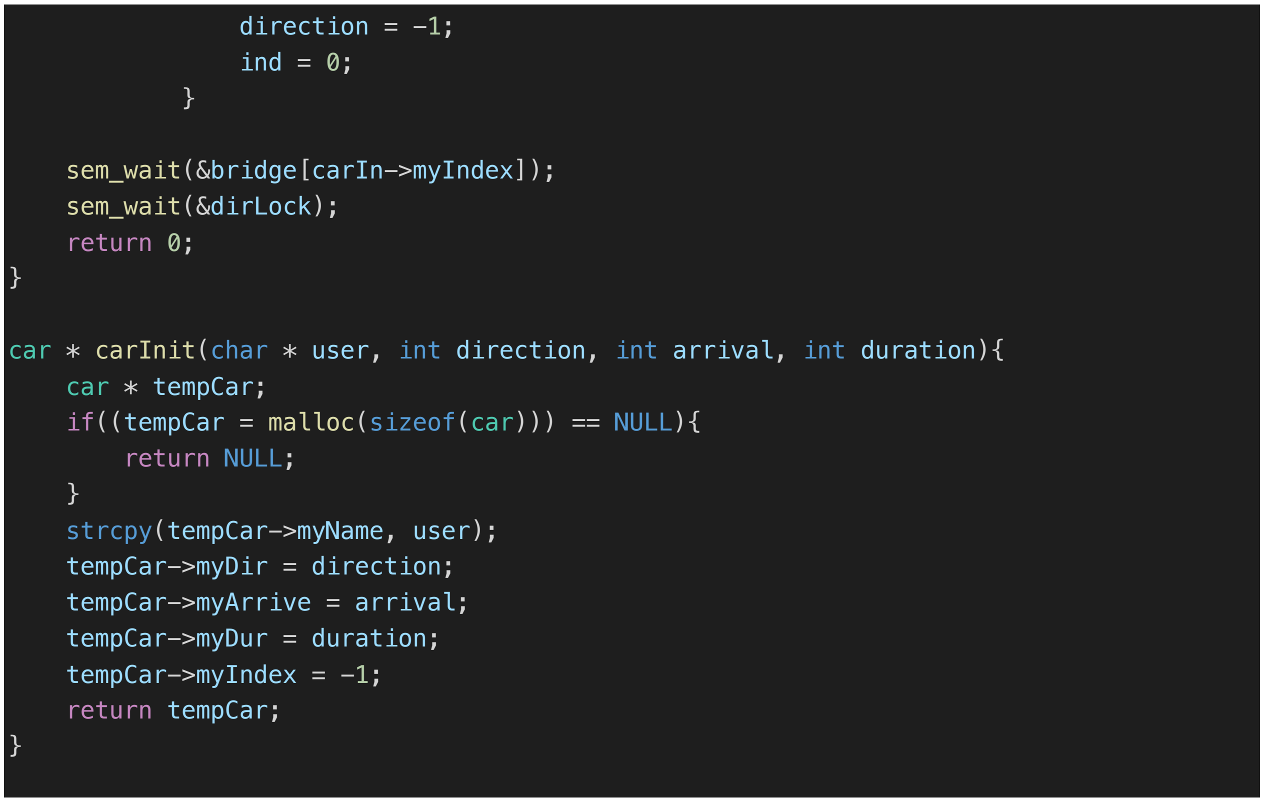
    char user[20];
    char direction[1];
    //help to get rid of first line in code instead of using stdin
    char garbage[10];
    int arrival = 0;
    int duration = 0;
    int ep = 0;
    car * list;
    if((list = malloc(10 * sizeof(car))) == NULL){
        return EXIT_FAILURE;
    }

    int z;
    for(z=0;z<4;z++){
        scanf("%s\t", &garbage);
    }


    int safe = 0;
    while(safe < 4 && (scanf("%s\t%s\t%d\t%d",&user, &direction, &arrival,
&duration)==4)){
        car *newInstance;
        int conv = -1;
        if(strcmp(direction, "N") == 0){
            conv = 1;
        }else{
            conv = 0;
        }
        newInstance = carInit(user, conv, arrival, duration);
        list[ep] = *newInstance;
        ep++;
        safe++;
    }
    pthread_t pileUp[ep];
    for(j=0;j<ep;j++){
        car * carPtr;
        carPtr = list+j;
        pthread_create(&pileUp[j], NULL, &routeTaken, (void*)carPtr);
    }
    int g;
    for(g=0; g<ep; g++){
        pthread_join(pileUp[g],NULL);
    }
    return EXIT_SUCCESS;
}

void * routeTaken(void * ptrToCurrentCar){
    car * carIn = (car*)ptrToCurrentCar;
    int onBridge = 0;
    int locT;
    while(carIn->myDur != 0){
        locT = t;
        if(onBridge == 0){
            if(carIn->myArrive < t){
                if(direction == -1){

                    sem_post(&bridge[ind]);
                    sem_post(&indexLock);
                    carIn->myIndex = ind;
                    sem_post(&dirLock);
                    direction = carIn->myDir;
                    sem_post(&dirLock);
                    onBridge = 1;
                    numCars++;
                    if(carIn->myDir == 1){
                        printf("Direction: North\n");
                    }else{
                        printf("Direction: South\n");
                    }
                }else{
                    if(carIn->myDir == direction){
                        sem_post(&bridge[ind+1]);
                            carIn->myIndex = ind+1;
                            onBridge = 1;
                            ind++;
                            numCars++;
                    }else{
                        sem_post(&bridge[ind]);
                        sem_wait(&bridge[ind]);
                    }
                }
            }
        }else{
            carIn->myDur--;
        }
    locT = t;
    locT++;
    sem_post(&tLock);
        t = locT;
    sem_wait(&tLock);
    }
            if(carIn->myIndex != 0){
                sem_post(&indexLock);
            }
            sem_wait(&dirLock);
            numCars--;
            printf("Name: %s\n", carIn->myName);
            sem_post(&indexLock);
            if(numCars == 0){
```



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                direction = -1;
                ind = 0;
            }

    sem_wait(&bridge[carIn->myIndex]);
    sem_wait(&dirLock);
    return 0;
}

car * carInit(char * user, int direction, int arrival, int duration){
    car * tempCar;
    if((tempCar = malloc(sizeof(car))) == NULL){
        return NULL;
    }
    strcpy(tempCar->myName, user);
    tempCar->myDir = direction;
    tempCar->myArrive = arrival;
    tempCar->myDur = duration;
    tempCar->myIndex = -1;
    return tempCar;
}
```