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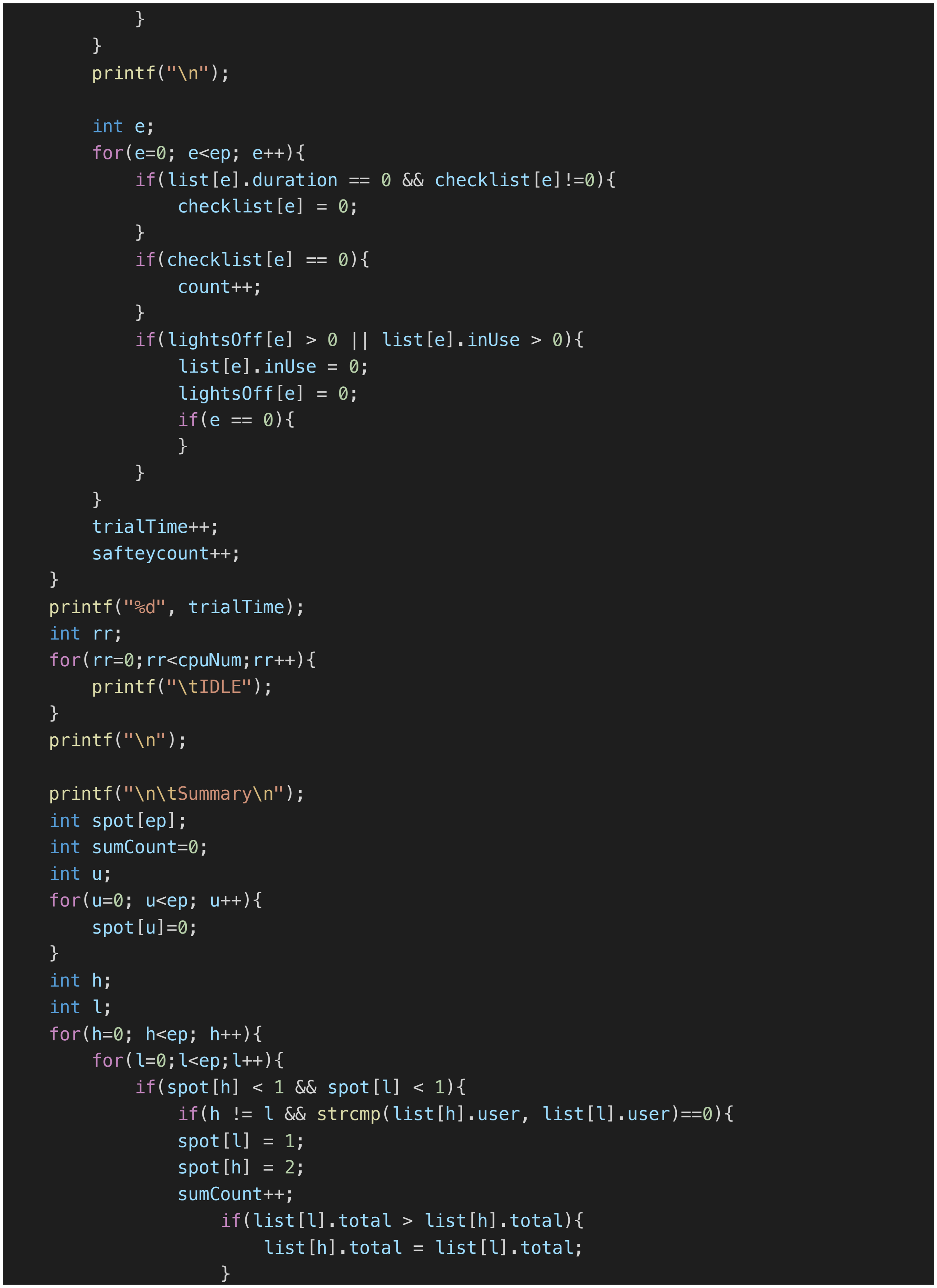
```c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <limits.h>
#include <time.h>

typedef struct information
{
    char user[50];
    char process;
    int arrival;
    int duration;
    int deadLine;
    int total;
    int lengthOnCPu;
    int inUse;
} information;

information *init(char * userInput, char processInput, int arrivalInput, int
durationInput, int deadLine);
void motherboard(information *list, int ep, int cpuNum);
information * edf(information *list, int time);
int freeList(information * list);
void printOutput(information * list);
int changeLoc = -1;


int main(){
    char *trashCollector = NULL;
    // this a pointer to the headers which would be taking into account but not used.
    information *processList;
    int cpuNum = 0;
    if((processList = malloc(4*sizeof(information)))==NULL){
        return 1;
    }
    printf("Please specify num of CPU:");
    scanf("%d", &cpuNum);
    printf("\n");
    int d;
    for(d=0; d<5; d++){
        scanf("%s\t", trashCollector);
    }
    int ep = 0;

    int i;
    for (i = 0; i < 4; i++){
        char expectedName[50] = "/0";
        char expectedProcess = 'a';
        int expectedArrival = 0;
        int expectedDuration = 0;
        int expectedDeadline;

        if(scanf("%s\t%c\t%d\t%d\t%d",expectedName, &expectedProcess,
&expectedArrival, &expectedDuration, &expectedDeadline)<5 && ep<0){
            printf("Error in scanning the data");
            return 1;
        }
    // Create an initialize function to help store the iincoming data in the structs

    information *newStorage;
    newStorage = init(expectedName, expectedProcess, expectedArrival,
expectedDuration, expectedDeadline);
    processList[i] = *newStorage;
    ep++;
}
    motherboard(processList, ep, cpuNum);;
    freeList(processList);
    return 0;
}

information *init(char * userInput, char processInput, int arrivalInput, int
durationInput, int deadLineInput){
    information * current;
    if((current = malloc(sizeof(information))) == NULL)
    {
        return NULL;
    }
    strcpy(current->user, userInput);
    current->process = processInput;
    current->arrival = arrivalInput;
    current->duration = durationInput;
    current->deadLine = deadLineInput;
    return current;
}

void motherboard(information *list, int ep, int cpuNum){
    int lightsOff[ep];
    int checklist[ep];
    int changed[ep];
    int trialTime = 0;
    int count = 0;
    int safteycount = 0;
    int f;
    int cpuCheck = 0;
    int conAge = 3 * cpuNum;
    for(f=0; f<ep; f++){
        checklist[f] = 1;
        lightsOff[f] = 0;
    }

    printf("This Would Result in:\nTime");
    int y;
    for(y=0;y<cpuNum;y++){
        printf("\tCPU%d",y+1);
    }
    printf("\n");

    while(count !=ep && safteycount != 100){
        count = 0;
        cpuCheck = 0;
        printf("%d\t",trialTime);
        int mn;
        for(mn = 0; mn<ep; mn++){
            changed[mn] = 0;
            if(list[mn].arrival == trialTime){
                list[mn].lengthOnCPu = 1;
            }if(list[mn].lengthOnCPu == conAge){
                list[mn].lengthOnCPu = 1;
            }
        }

        while(cpuCheck != cpuNum){
            changeLoc = -1;
            information * temp;
            temp = edf(list, trialTime);
            if(changeLoc > -1){
                lightsOff[changeLoc] = 1;
            }
            int q;
            for(q=0;q<ep;q++){
                if(changeLoc > -1 && changeLoc == q){
                    changed[q] = 1;
                }
            }
            list = temp;
            cpuCheck++;
        }
        int d;
        for(d = 0; d<ep; d++){
            if(changed[d] != 1){
                list[d].lengthOnCPu = list[d].lengthOnCPu +1;
            }else{
                list[d].lengthOnCPu = 0;
```



```
            }
        }
        printf("\n");

        int e;
        for(e=0; e<ep; e++){
            if(list[e].duration == 0 && checklist[e]!=0){
                checklist[e] = 0;
            }
            if(checklist[e] == 0){
                count++;
            }
            if(lightsOff[e] > 0 || list[e].inUse > 0){
                list[e].inUse = 0;
                lightsOff[e] = 0;
                if(e == 0){
                }
            }
        }
        trialTime++;
        safteycount++;
    }
    printf("%d", trialTime);
    int rr;
    for(rr=0;rr<cpuNum;rr++){
        printf("\tIDLE");
    }
    printf("\n");

    printf("\n\tSummary\n");
    int spot[ep];
    int sumCount=0;
    int u;
    for(u=0; u<ep; u++){
        spot[u]=0;
    }
    int h;
    int l;
    for(h=0; h<ep; h++){
        for(l=0;l<ep;l++){
            if(spot[h] < 1 && spot[l] < 1){
                if(h != l && strcmp(list[h].user, list[l].user)==0){
                spot[l] = 1;
                spot[h] = 2;
                sumCount++;
                    if(list[l].total > list[h].total){
                        list[h].total = list[l].total;
                    }
```

```c
                }
            }
        }
    }
    int value = ep-sumCount;
    information * sumList;
    if((sumList = malloc(value * sizeof(information))) ==NULL){
        return;
    }

    int increment = 0;
    int o;
    for(o=0; o<ep; o++){
        if(spot[o]!=1){
            sumList[increment] = list[o];
            increment++;
        }
    }
    int p;
    for(p=0;p<value;p++){
        printf("\t%s\t%d\n", sumList[p].user, sumList[p].total+1);
    }
}

information * edf(information *list, int time){
    int minDuration = 999;
    int processLoc;
    int minDeadLine;
    int check = 0;
    int j;
    for(j=0;j<4;j++){
        minDeadLine = list[j].deadLine;
        if(list[j].arrival <= time && list[j].deadLine < minDeadLine){
            if(list[j].duration < minDuration && list[j].duration != 0){
                minDuration = list[j].duration;
                processLoc = j;
                check++;
            }
        }
    }
    if(check != 0){
        list[processLoc].duration = list[processLoc].duration - 1;
        list[processLoc].total = time;
        printf("\t%c\t%c\n", list[processLoc].process, list[processLoc + 1].process);
    }
    return list;
}
```

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```c
int freeList(information *list){
    free(list);
    return 1;
}

void printOutput(information * in){
    int j;
    for(j=0;j<4;j++){
        printf("%s\t%c\t%d\t%d\t%dn", in[j].user, in[j].process, in[j].arrival,
in[j].duration, in[j].deadLine);
    }
}
```