SSN COLLEGE OF ENGINEERING (Autonomous)

DEPARTMENT OF CSE

UCS308 Data Structures Lab

Assignment 6

Implementation of Queue

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Queue.h:

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>

typedef struct Node
{   char jno[5];
    int bt;
    struct Node *next;
}Queue;

void enqueue(char no[3],int btime,Queue **Qhead,Queue **Qrear)
{
    Queue *node;
    node = (Queue*)malloc(sizeof(Queue));
```

```
    node->bt=btime;
    strcpy(node->jno,no);
    if((*Qhead)==NULL)
    {
        (*Qhead)=(*Qrear)=node;
    }
    else
    {
        (*Qrear)->next=node;
        (*Qrear)=node;
    }

}

int waitime(int time,Queue *Qhead,Queue *Qrear)
{
    time+=Qrear->bt;
    return time;
}

int jobs(Queue **Qhead,Queue **Qrear)
{
    Queue *temp;
    temp=*Qhead;
    int no=0;
    while(temp!=*Qrear)
    {
        no+=1;
        temp=temp->next;
    }
    if(*Qhead==*Qrear)
```

```
    {
        return 1;
    }
    else
    {
        return (no+1);
    }

}

void display(Queue *Qhead,Queue *Qrear)
{

    Queue *temp;
    temp=Qhead;
    while(temp!=Qrear)
    {
        printf("%s\t%d\n",temp->jno,temp->bt);
        temp=temp->next;
    }
    if(Qhead==Qrear)
    {
        printf("%s\t%d\n",(Qhead)->jno,(Qrear)->bt);

    }
    else
    {
        printf("%s\t%d\n",(Qrear)->jno,(Qrear)->bt);
    }

}
```

Queue.c :

```
#include<stdio.h>
#include<stdlib.h>
#include<string.h>
#include"queue.h"


int main()
{
    Queue *Q1head,*Q1rear,*Q2head,*Q2rear;
    Q1head=Q1rear=Q2head=Q2rear=NULL;
    char pr[10];
    int bt;
    static int Q1Time,Q2Time;
    Q1Time=0;
    Q2Time=0;
    int choice=1;
    while(choice!=0)
    {
        printf("Enter the jobID and BurstTime:\n");
        scanf("%s",pr);
        scanf("%d",&bt);
        if(Q2Time>=Q1Time)
        {
            printf("Queue 1 Waiting Time is %d\nQueue 2
                    Waiting Time is %d\n”,Q1Time,Q2Time);
            enqueue(pr,bt,&Q1head,&Q1rear);
            Q1Time=waitime(Q1Time,Q1head,Q1rear);
            printf("Job added to Queue 1.\n");
```

```
        }


        else
        {
            printf("Queue 2 Waiting Time is %d\nQueue1 Waiting
                    Time is %d\n",Q2Time,Q1Time);
            enqueue(pr,bt,&Q2head,&Q2rear);
            Q2Time=waitime(Q2Time,Q2head,Q2rear);
            printf("Job added to Queue 2.\n");
        }
        printf("Do you want to continue?\n1.Yes\n0.No\n");
        scanf("%d",&choice);


    }


    printf("\nQueue 1:\n");
    printf("Job Burst time\n");
    display(Q1head,Q1rear);
    printf("Total jobs on the queue
:%d.\n",jobs(&Q1head,&Q1rear));
    printf("Waiting time on the queue :%d.\n",Q1Time);
    printf("Average waiting time :%f.\n",(Q1Time/(1.0 *
jobs(&Q1head,&Q1rear))));
    printf("\n");
    printf("\nQueue 2:\n");
    printf("Job Burst time\n");
    display(Q2head,Q2rear);
    printf("Total jobs on the queue
:%d.\n",jobs(&Q2head,&Q2rear));
    printf("Waiting time on the queue:%d.\n",Q2Time);
```

```
    printf("Average waiting time :%f.\n",(Q2Time/(1.0 *
jobs(&Q2head,&Q2rear))));


    return 0;
}
```

Output:

```
Enter the jobID and BurstTime:
J1
6
Queue 1 Waiting Time is 0
Queue 2 Waiting Time is 0
Job added to Queue 1.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J2
5
Queue 2 Waiting Time is 0
Queue1 Waiting Time is 6
Job added to Queue 2.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J3
2
Queue 2 Waiting Time is 5
Queue1 Waiting Time is 6
Job added to Queue 2.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J4
3
Queue 1 Waiting Time is 6
Queue 2 Waiting Time is 7
Job added to Queue 1.
Do you want to continue?
```

```
1.Yes
0.No
1
Enter the jobID and BurstTime:
J5
7
Queue 2 Waiting Time is 7
Queue1 Waiting Time is 9
Job added to Queue 2.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J6
3
Queue 1 Waiting Time is 9
Queue 2 Waiting Time is 14
Job added to Queue 1.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J7
7
Queue 1 Waiting Time is 12
Queue 2 Waiting Time is 14
Job added to Queue 1.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J8
2
Queue 2 Waiting Time is 14
Queue1 Waiting Time is 19
Job added to Queue 2.
Do you want to continue?
1.Yes
0.No
1
Enter the jobID and BurstTime:
J9
3
Queue 2 Waiting Time is 16
Queue1 Waiting Time is 19
Job added to Queue 2.
Do you want to continue?
1.Yes
```

```
0.No
1
Enter the jobID and BurstTime:
J10
7
Queue 1 Waiting Time is 19
Queue 2 Waiting Time is 19
Job added to Queue 1.
Do you want to continue?
1.Yes
0.No
0

Queue 1:
Job Burst time
J1  6
J4  3
J6  3
J7  7
J10 7
Total jobs on the queue :5.
Waiting time on the queue :26.
Average waiting time :5.200000.


Queue 2:
Job Burst time
J2  5
J3  2
J5  7
J8  2
J9  3
Total jobs on the queue :5.
Waiting time on the queue:19.
Average waiting time :3.800000.
```