# SSN College of Engineering, Kalavakkam

# Department of Computer Science and Engineering

# III Semester - CSE 'A ',’B’ & ‘C’

# UCS 1312 Data Structures Lab

# Academic Year: 2019-2020 Batch: 2018-2022

**Name : Rahul Ram M**

**Class : CSE – B**

**Register Number : 185001121**

**Exercise 6: Application of queue**

**• Create queue ADT as a header file “queue.h”.**

**• Create node with two fields namely job number and burst time (jno, bt).**

**• Assume there are two queues Q1 and Q2.**

**• Insert the data given below in Q1 and Q2 based on minimum waiting time.**

**(J1, 6), (J2, 5), (J3, 2), (J4, 3), (J5, 7), (J6, 3), (J7, 7), (J8, 2), (J9, 3) and (J10, 7).**

**• Compute the average waiting time of Q1 and Q2**

**• Display both the queues with average waiting time.**

**//queue.h**

typedef struct myqueue

{

char jno[4];

float bt;

struct myqueue \*next;

}queue;

void enqueue(queue \*\*Qf,queue \*\*Qr,char jno[],float bt)

{

queue \*new,\*temp;

new=(queue \*)malloc(sizeof(queue));

strcpy(new->jno,jno);

new->bt=bt;

new->next=NULL;

if((\*Qr)==NULL)

{

(\*Qf)=(\*Qr)=new;

}

else if((\*Qf)->next==NULL)

{

temp=(\*Qr);

(\*Qr)=new;

(\*Qf)->next=(\*Qr);

}

else

{

(\*Qr)->next=new;

(\*Qr)=(\*Qr)->next;

}

}

void display(queue \*\*Qf,float awt)

{

queue \*temp1;

for(temp1=(\*Qf);temp1!=NULL;temp1=temp1->next)

{

printf("Job Number:%s\t",temp1->jno);

printf("Burst Time:%.2f\n",temp1->bt);

}

printf("Average waiting time is:%.2f\n\n",awt);

}

**//main**

#include<stdio.h>

#include<stdlib.h>

#include<string.h>

#include"queue.h"

void enqueue(queue \*\*Qf,queue \*\*Qr,char jno[],float bt);

void display(queue \*\*Qf,float awt);

int main()

{

char j\_no[4];

int ch=1,temp1,temp2,a1=0,a2=0;

float wt1=0,wt2=0,but,awt1,awt2;

queue \*Qf1=NULL,\*Qf2=NULL,\*Qr1=NULL,\*Qr2=NULL;

while(ch==1)

{

printf("Enter the Name of the job :");

scanf("%s",j\_no);

printf("Enter its burst time:");

scanf("%f",&but);

temp1=wt1+but;

temp2=wt2+but;

if(temp1<temp2)

{

wt1=temp1;

a1++;

enqueue(&Qf1,&Qr1,j\_no,but);

}

else if(temp1>temp2)

{

wt2=temp2;

a2++;

enqueue(&Qf2,&Qr2,j\_no,but);

}

else

{

wt1=temp1;

a1++;

enqueue(&Qf1,&Qr1,j\_no,but);

}

printf("Continue(1.Yes,2.No):");

scanf("%d",&ch);

}

awt1=wt1/a1;

awt2=wt2/a2;

printf("\n");

printf("Displaying Queue 1!\n");

display(&Qf1,awt1);

printf("Displaying Queue 2!\n");

display(&Qf2,awt2);

return 0;

}

**//Sample I/P O/P:**

Continue(1.Yes,2.No):1

Enter the Name of the job :J4

Enter its burst time:3

Continue(1.Yes,2.No):1

Enter the Name of the job :J5

Enter its burst time:7

Continue(1.Yes,2.No):1

Enter the Name of the job :J6

Enter its burst time:3

Continue(1.Yes,2.No):1

Enter the Name of the job :J7

Enter its burst time:7

Continue(1.Yes,2.No):1

Enter the Name of the job :J8

Enter its burst time:2

Continue(1.Yes,2.No):1

Enter the Name of the job :J9

Enter its burst time:3

Continue(1.Yes,2.No):1

Enter the Name of the job :J10

Enter its burst time:7

Continue(1.Yes,2.No):2

Displaying Queue 1!

Job Number:J1 Burst Time:6.00

Job Number:J4 Burst Time:3.00

Job Number:J6 Burst Time:3.00

Job Number:J7 Burst Time:7.00

Job Number:J10 Burst Time:7.00

Average waiting time is:5.20

Displaying Queue 2!

Job Number:J2 Burst Time:5.00

Job Number:J3 Burst Time:2.00

Job Number:J5 Burst Time:7.00

Job Number:J8 Burst Time:2.00

Job Number:J9 Burst Time:3.00

Average waiting time is:3.80