**circular-queue.c**

//write a program to implement circular queue using array.

#include <stdio.h>

#define MAX 10

int queue[MAX], rear = -1, front = -1;

int isEmpty(){

return (rear == -1);

}

int len(){

if(rear == -1)

return 0;

int l = rear - front + 1;

if(rear < front)

l = MAX + l;

return l;

}

int isFull(){

return len()==MAX;

}

void enqueue(int data){

if(isFull()){

printf("Queue is Full.\n");

return;

}

rear = (rear + 1) % MAX;

queue[rear] = data;

if(front == -1)

front++;

}

int dequeue(){

if(isEmpty()){

printf("Queue is Empty.\n");

return -1;

}

int data = queue[front];

front++;

if(rear+1 == front)

rear = front = -1;

return data;

}

void display(){

if(isEmpty()){

printf("Empty Queue.\n");

return;

}

int i;

if(front <= rear){

for(i = front; i <= rear; i++){

printf("%d -> ",queue[i]);

}

}else{

for(i = front; i < MAX; i++){

printf("%d -> ",queue[i]);

}

for(i = 0; i <= rear; i++){

printf("%d -> ",queue[i]);

}

}

printf("NULL\n");

}

void main(){

if(isEmpty())

printf("The Queue is empty.\n");

else

printf("The Queue is not empty.\n");

printf("The length of the Queue is %d\n",len());

enqueue(10);

printf("The length of the Queue is %d\n",len());

enqueue(102);enqueue(15);enqueue(13);enqueue(12);enqueue(12);enqueue(12);enqueue(102);enqueue(15);

enqueue(13);

display();

printf("The length of the Queue is %d\n",len());

if(isFull()){

printf("The Queue is Full.\n");

}else{

printf("The Queue is not Full.\n");

}

printf("Removed %d\n",dequeue());

printf("Removed %d\n",dequeue());

printf("Removed %d\n",dequeue());

display();

enqueue(1063451);

enqueue(106);

enqueue(104);

enqueue(102);

display();

}

**OUTPUT**

PS S:\WorkSpace\CollegeWork\DataStructure\Temp> gcc .\circular-queue.c

PS S:\WorkSpace\CollegeWork\DataStructure\Temp> ./a

The Queue is empty.

The length of the Queue is 0

The length of the Queue is 1

10 -> 102 -> 15 -> 13 -> 12 -> 12 -> 12 -> 102 -> 15 -> 13 -> NULL

The length of the Queue is 10

The Queue is Full.

Removed 10

Removed 102

Removed 15

13 -> 12 -> 12 -> 12 -> 102 -> 15 -> 13 -> NULL

Queue is Full.

13 -> 12 -> 12 -> 12 -> 102 -> 15 -> 13 -> 1063451 -> 106 -> 104 -> NULL

PS S:\WorkSpace\CollegeWork\DataStructure\Temp>