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++){
```

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            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>
```