EX 7 IMPLEMENTATION OF QUEUE USING ARRAY AND LINKED LIST

Queue using stack

```
#include <stdio.h>
#define MAX 5
int Queue[MAX], front = -1, rear = -1;
int IsFull();
int IsEmpty();
void Enqueue(int ele);
void Dequeue();
void Display();
int main()
{
int ch, e;
do
 {
 printf("1.ENQUEUE 2.DEQUEUE 3.DISPLAY 4.EXIT");
 printf("\nEnter your choice : ");
 scanf("%d", &ch);
 switch(ch)
 {
 case 1:
 printf("Enter the element : ");
 scanf("%d", &e);
 Enqueue(e);
 break;
 case 2:
 Dequeue();
 break;
 case 3:
 Display();
 break;
 }
 } while(ch <= 3);
return 0;
}
int IsFull()
{
if(rear == MAX - 1)
 return 1;
else
 return 0;
```

```
}
int IsEmpty()
{
if(front == -1)
 return 1;
else
 return 0;
}
void Enqueue(int ele)
{
if(IsFull())
 printf("Queue is Overflow...!\n");
else
 {
 rear = rear + 1;
 Queue[rear] = ele;
 if(front == -1)
 front = 0;
 }
}
void Dequeue()
{
if(IsEmpty())
 printf("Queue is Underflow...!\n");
else
 {
 printf("%d\n", Queue[front]);
 if(front == rear)
 front = rear = -1;
 else
 front = front + 1;
 }
}
void Display()
{
int i;
if(IsEmpty())
 printf("Queue is Underflow...!\n");
else
 {
 for(i = front; i <= rear; i++)
 printf("%d\t", Queue[i]);
 printf("\n");
 }
```

}

Queue using linked list

```
#include <stdio.h>
#include <stdlib.h>
struct node
{
int Element;
struct node *Next;
}*Front = NULL, *Rear = NULL;
typedef struct node Queue;
int IsEmpty(Queue *List);
void Enqueue(int e);
void Dequeue();
void Display();
int main()
{
int ch, e;
do
 {
 printf("1.ENQUEUE 2.DEQUEUE 3.DISPLAY 4.EXIT");
 printf("\nEnter your choice : ");
 scanf("%d", &ch);
 switch(ch)
 {
 case 1:
 printf("Enter the element : ");
 scanf("%d", &e);
 Enqueue(e);
 break;
 case 2:
 Dequeue();
 break;
 case 3:
 Display();
 break;
 }
 } while(ch <= 3);
return 0;
}
int IsEmpty(Queue *List)
```

```
{
if(List == NULL)
 return 1;
else
 return 0;
}
void Enqueue(int e)
{
Queue *NewNode = malloc(sizeof(Queue));
 NewNode->Element = e;
 NewNode->Next = NULL;
if(Rear == NULL)
 Front = Rear = NewNode;
else
 {
 Rear->Next = NewNode;
 Rear = NewNode;
 }
}
void Dequeue()
{
if(IsEmpty(Front))
 printf("Queue is Underflow...!\n");
else
 {
 Queue *TempNode;
 TempNode = Front;
 if(Front == Rear)
 Front = Rear = NULL;
 else
 Front = Front->Next;
 printf("%d\n", TempNode->Element);
 free(TempNode);
 }
}
void Display()
{
if(IsEmpty(Front))
 printf("Queue is Underflow...!\n");
else
 {
 Queue *Position;
 Position = Front;
 while(Position != NULL)
```

```
 {
 printf("%d\t", Position->Element);
 Position = Position->Next;
 }
 printf("\n");
 }
}
```

OUTPUT:

```
1.addq
2.delq
3.exit
Select the option1

Enter data2

 The element is added into the queue
1.addq
2.delq
3.exit
Select the option3
```

OUTPUT 2:

```
***Main Menu***

====================

1. Insert an element
2. Delete an element
3. Display the queue
4. Exit

Enter your choice: 3

Empty queue.
```