20BCS042 MOHD ADIL:

PROGRAM 7

```
#include <stdio.h>
#include <stdlib.h>
struct Queue
{
   int size;
   int front;
   int rear;
   int *Q;
};
void create(struct Queue *q, int size)
{
   q->size = size;
   q->front = q->rear = -1;
   q->Q = (int *)malloc(q->size * sizeof(int));
}
void enqueue(struct Queue *q)
{
   if (q->rear == q->size - 1)
      printf("Queue is Full\n");
   else
   {
      printf("Enter Element : ");
      int n;
      scanf("%d", &n);
      q->rear++;
      q->Q[q->rear] = n;
   }
}
int dequeue(struct Queue *q)
{
```

```
    int x = -1;
    if (q->front == q->rear)
        printf("Queue is Empty\n");
    else
    {

        q->front++;
        x = q->Q[q->front];
    }
    return x;
}
int isEmpty(struct Queue *q)
{
    if (q->front == q->rear)
        printf("Queue is Empty\n");
    return 1;
    return 0;
}
int isFull(struct Queue *q)
{
    if (q->rear >= q->size - 1)
        printf("Queue is full!\n");
    return 1;
    return 0;
}
void Display(struct Queue q)
{
    int i;
    for (i = q.front + 1; i <= q.rear; i++)
        printf("%d ", q.Q[i]);
    printf("\n");
}
int main()
```

```
{
   struct Queue q;
   create(&q, 5);
   int choice;
   printf("\n1. Enqueue\n2. Dequeue\n3. Front and Rear Element \n4. Isempty\n5. Isfull\n6. Total no of element\n7. Display\n8. Exit\n");
   while (1)
   {
      printf("Enter the choice: ");
      scanf("%d", &choice);
      switch (choice)
      {
      case 1:
         enqueue(&q);
         break;
      case 2:
         printf("Dequeued element->%d\n",dequeue(&q));
         break;
      case 3:
         printf("Front Element->%d\n", q.Q[q.front + 1]);
         printf("Rear Element->%d\n", q.Q[q.rear]);
      case 4:
         isEmpty(&q);
         break;
      case 5:
         isFull(&q);
         break;
      case 6:
         printf("Total number of elements->%d\n", q.rear - q.front);
         break;
      case 7:
         Display(q);
         break;
```

```
        case 8:
            printf("Exiting...");
            exit(0);
            break;
        }
    }

    return 0;
}
```

OUTPUT:

```
PS C:\Users\aadil\Desktop\CSE\dsalab> cd "c:\Users\aadil\Desktop\CSE\dsalab\" ; if ($?) { gcc program7.c -o program7 }

1. Enqueue
2. Dequeue
3. Front and Rear Element
4. Isempty
5. Isfull
6. Total no of element
7. Display
8. Exit
Enter the choice: 4
Queue is Empty
Enter the choice: 1
Enter Element : 1
Enter the choice: 1
Enter Element : 2
Enter the choice: 1
Enter Element : 3
Enter the choice: 1
Enter Element : 4
Enter the choice: 1
Enter Element : 5
Enter the choice: 5
Queue is full!
Enter the choice: 2
Dequeued element->1
Enter the choice: 3
Front Element->2
Rear Element->5
Enter the choice: 6
Total number of elements->4
Enter the choice: 7
2 3 4 5
Enter the choice: 8
Exiting...
PS C:\Users\aadil\Desktop\CSE\dsalab>
```