

## EXPERIMENT NO.04

### PROGRAM:

```
Open  dequeue.c  Save  -  α  X
1 #include <stdbool.h>
2 #include <stdio.h>
3
4 #include <stdio.h>
5
6 #define MAX 5
7
8 int QUEUE[MAX], REAR =
9 -1, FRONT = -1;
10 void input_deque();
11 void output_deque();
12 void insertRear();
13 void deleteFront();
14 void deleteRear();
15 void insertFront();
16 void display();
17 bool isFull();
18 bool isEmpty();
19
20 int main() {
21
22     int choice;
23
24     printf("\n *****MAIN MENU*****");
25     printf("\n 1.Input restricted deque");
26     printf("\n 2.Output restricted deque");
27     printf("Enter your choice : ");
28     scanf("%d",&choice);
29     switch(choice)
30     {
31     case 1:
32         input_deque();
33         break;
34     case 2:
35         output_deque();
36         break;
37     }
38     return 0;
39 }
40
41 void input_deque(){
42     int option;
43     do
44 {
```

```
43 do
44 {
45     printf("\n INPUT RESTRICTED DEQUE");
46     printf("\n 1.Insert at right");
47     printf("\n 2.Delete from left");
48     printf("\n 3.Delete from right");
49     printf("\n 4.Display");
50     printf("\n 5.Quit");
51     printf("\n Enter your option : ");
52     scanf("%d",&option);
53     switch(option)
54     {
55     case 1:
56         insertRear();
57         break;
58     case 2:
59         deleteFront();
60         break;
61     case 3:
62         deleteRear();
63         break;
64     case 4:
65         display();
66         break;
67     }
68     while(option!=5);
69 }
70 }
71 void output_deque()
72 {
73     int option;
74     do
75     {
76         printf("OUTPUT RESTRICTED DEQUE\n");
77         printf("\n 1.Insert at right");
78         printf("\n 2.Insert at left");
79         printf("\n 3.Delete from left");
80         printf("\n 4.Display");
81         printf("\n 5.Quit");
82         printf("\n Enter your option : ");
83         scanf("%d",&option);
```

```
120 printf("Enter your option : ");
```

```
83 scanf("%d",&option);
84 switch(option)
85 {
86 case 1:
87 insertRear();
88 break;
89 case 2:
90 insertFront();
91 break;
92 case 3:
93 deleteRear();
94 break;
95 case 4:
96 display();
97 break;
98 }
99 while(option!=5);
100 }
101 bool isFull() {
102 return REAR== MAX -1; }
103
104 bool isEmpty() {
105 return FRONT < 0; }
106
107 void insertRear() {
108
109 int a;
110
111 if (isFull()) {
112 printf("Queue is full");
113 return;
114 }
115
116 if (FRONT == -1)
117 FRONT++;
118
119 printf("Enter Element :");
120 scanf("%d", &a);
121
122 QUEUE[++REAR] = a;
123 }
124
125 void deleteFront() {
126
```

```
120
127 int value;
128
129 if (isEmpty()) {
130 printf("Queue Empty");
131 return;
132 }
133
134 value =
135 QUEUE[FRONT];
136
137 if (REAR == FRONT)
138 FRONT = REAR = -1;
139 else
140 FRONT++;
141
142 printf("The deleted element from Front is : %d",value);
143 }
144
145 void deleteRear() {
146
147 int value;
148
149 if (isEmpty()) {
150 printf("Queue Empty");
151 return;
152 }
153
154 value = QUEUE[REAR];
155
156 if (REAR == FRONT)
157 FRONT = REAR = -1;
158 else
159 REAR--;
160
161 printf("The deleted element from rear is: %d", value);
162 }
163
164 void insertFront() {
165
166 if (FRONT == 0) {
167 printf("Front is at the beginning - insertion not possible");
168 return;
169 }
170
```

```
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8 int QUEUE[MAX], REAR =
9 -1, FRONT = -1;
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11 void output_deque();
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15 void insertFront();
16 void display();
17 bool isFull();
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20 int main() {
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22     int choice;
23
24     printf("\n *****MAIN MENU*****");
25     printf("\n 1.Input restricted deque");
26     printf("\n 2.Output restricted deque");
27     printf("Enter your choice : ");
28     scanf("%d",&choice);
29     switch(choice)
30     {
31     case 1:
32         input_deque();
33         break;
34     case 2:
35         output_deque();
36         break;
37     }
38     return 0;
39 }
40
41 void input_deque(){
42     int option;
43     do
44     {
```

## OUTPUT:

```
tl4@22DL407:~$ gcc dequeue.c
tl4@22DL407:~$ ./a.out

*****MAIN MENU*****
1.Input restricted deque
2.Output restricted dequeEnter your choice : 1

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :20

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :22

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :25

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :30
```

```
Enter Element :20

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :22

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :25

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 1
Enter Element :30

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 4
Printing DeQueue:
    20    22    25    30
```

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