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Class : SYIT Experiment No. 04

```
shree.c
1#include <stdio.h>
2#define MAX 10
3
4int deque[MAX];
5int left = -1, right = -1;
6
7void input_deque(void);
8void output_deque(void);
9void insert_left(void);
10void insert_right(void);
11void delete_left(void);
12void delete_right(void);
13void display(void);
14
15int main() {
16    int option;
17    printf("\n *****MAIN MENU*****");
18    printf("\n 1.Input restricted deque");
19    printf("\n 2.Output restricted deque");
20    printf("\n Enter your option : ");
21    scanf("%d", &option);
22
23    switch (option) {
24        case 1:
25            input_deque();
26            break;
27        case 2:
28            output_deque();
29            break;
30    }
31    return 0;
32}
33
34void input_deque() {
35    int option;
36    do {
37        printf("\n INPUT RESTRICTED DEQUE");
38        printf("\n 1.Insert at right");
39        printf("\n 2.Delete from left");
40        printf("\n 3.Delete from right");
41        printf("\n 4.Display");
42        printf("\n 5.Quit");
43        printf("\n Enter your option : ");
44        scanf("%d", &option);
45
```

```
shree.c
44        scanf("%d", &option);
45
46        switch (option) {
47            case 1:
48                insert_right();
49                break;
50            case 2:
51                delete_left();
52                break;
53            case 3:
54                delete_right();
55                break;
56            case 4:
57                display();
58                break;
59        }
60    } while (option != 5);
61}
62
63void output_deque() {
64    int option;
65    do {
66        printf("\n OUTPUT RESTRICTED DEQUE");
67        printf("\n 1.Insert at right");
68        printf("\n 2.Insert at left");
69        printf("\n 3.Delete from left");
70        printf("\n 4.Display");
71        printf("\n 5.Quit");
72        printf("\n Enter your option : ");
73        scanf("%d", &option);
74
75        switch (option) {
76            case 1:
77                insert_right();
78                break;
79            case 2:
80                insert_left();
81                break;
82            case 3:
83                delete_left();
84                break;
85            case 4:
86                display();
87                break;
88        }
89    }
```

```
Open  shree.c  Save  -  σ  x
89 } while (option != 5);
90 }
91
92 void insert_right() {
93     int val;
94     printf("\n Enter the value to be added: ");
95     scanf("%d", &val);
96     if ((left == 0 && right == MAX - 1) || (left == right + 1)) {
97         printf("\n OVERFLOW");
98         return;
99     }
100     if (left == -1) {
101         /* If queue is initially empty */
102         left = 0;
103         right = 0;
104     } else {
105         if (right == MAX - 1) /* right is at the last position of queue */
106             right = 0;
107         else
108             right = right + 1;
109     }
110     deque[right] = val;
111 }
112
113 void insert_left() {
114     int val;
115     printf("\n Enter the value to be added: ");
116     scanf("%d", &val);
117     if ((left == 0 && right == MAX - 1) || (left == right + 1)) {
118         printf("\n OVERFLOW");
119         return;
120     }
121     if (left == -1) {
122         /* If queue is initially empty */
123         left = 0;
124         right = 0;
125     } else {
126         if (left == 0)
127             left = MAX - 1;
128         else
129             left = left - 1;
130     }
131     deque[left] = val;
132 }
```

C Tab Width: 8 Ln 166, Col 13 INS

```
Open  shree.c  Save  -  σ  x
132 deque[left] = val;
133 }
134
135 void delete_left() {
136     if (left == -1) {
137         printf("\n UNDERFLOW");
138         return;
139     }
140     printf("\n The deleted element is: %d", deque[left]);
141     if (left == right) /* Queue has only one element */
142     {
143         left = -1;
144         right = -1;
145     } else {
146         if (left == MAX - 1)
147             left = 0;
148         else
149             left = left + 1;
150     }
151 }
152
153 void delete_right() {
154     if (left == -1) {
155         printf("\n UNDERFLOW");
156         return;
157     }
158     printf("\n The element deleted is: %d", deque[right]);
159     if (left == right) /* Queue has only one element */
160     {
161         left = -1;
162         right = -1;
163     } else {
164         if (right == 0)
165             right = MAX - 1;
166         else
167             right = right - 1;
168     }
169 }
170
171 void display() {
172     int front = left, rear = right;
173     if (front == -1) {
174         printf("\n QUEUE IS EMPTY");
175         return;
176     }
```

C Tab Width: 8 Ln 166, Col 13 INS

```
Open shree.c Save
153 void delete_right() {
154     if (left == -1) {
155         printf("\n UNDERFLOW");
156         return;
157     }
158     printf("\n The element deleted is: %d", deque[right]);
159     if (left == right) /* Queue has only one element */
160     {
161         left = -1;
162         right = -1;
163     } else {
164         if (right == 0)
165             right = MAX - 1;
166         else
167             right = right - 1;
168     }
169 }
170
171 void display() {
172     int front = left, rear = right;
173     if (front == -1) {
174         printf("\n QUEUE IS EMPTY");
175         return;
176     }
177     printf("\n The elements of the queue are: ");
178
179     if (front <= rear) {
180         while (front <= rear) {
181             printf("%d ", deque[front]);
182             front++;
183         }
184     } else {
185         while (front <= MAX - 1) {
186             printf("%d ", deque[front]);
187             front++;
188         }
189         front = 0;
190         while (front <= rear) {
191             printf("%d ", deque[front]);
192             front++;
193         }
194     }
195     printf("\n");
196 }
```

C Tab Width: 8 Ln 166, Col 13 INS

```
student@dl405-HP-ProDesk-400-G7-Microtower-PC: ~
student@dl405-HP-ProDesk-400-G7-Microtower-PC:~$ gedit shree.c
student@dl405-HP-ProDesk-400-G7-Microtower-PC:~$ gcc shree.c
student@dl405-HP-ProDesk-400-G7-Microtower-PC:~$ ./a.out

*****MAIN MENU*****
1.Input restricted deque
2.Output restricted deque
Enter your option : 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 the value to be added: 5

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

The elements of the queue are: 5

INPUT RESTRICTED DEQUE
1.Insert at right
2.Delete from left
3.Delete from right
4.Display
5.Quit
Enter your option : 5
student@dl405-HP-ProDesk-400-G7-Microtower-PC:~$
```

