

Experiment 03\circular_queue.c

```
1  #include <stdio.h>
2  #define MAX 5
3
4  int queue[MAX];
5  int front = -1, rear = -1;
6
7  void enqueue(int value) {
8      if ((front == 0 && rear == MAX - 1) || (rear == (front - 1) % (MAX - 1))) {
9          printf("Queue Overflow\n");
10         return;
11     }
12     if (front == -1) {
13         front = rear = 0;
14         queue[rear] = value;
15     } else if (rear == MAX - 1 && front != 0) {
16         rear = 0;
17         queue[rear] = value;
18     } else {
19         rear++;
20         queue[rear] = value;
21     }
22     printf("%d enqueued\n", value);
23 }
24
25 void dequeue() {
26     if (front == -1) {
27         printf("Queue Underflow\n");
28         return;
29     }
30     printf("%d dequeued\n", queue[front]);
31     if (front == rear) {
32         front = rear = -1;
33     } else if (front == MAX - 1) {
34         front = 0;
35     } else {
36         front++;
37     }
38 }
39
40 void display() {
41     if (front == -1) {
42         printf("Queue is empty\n");
43         return;
44     }
45     printf("Queue: ");
46     if (rear >= front) {
47         for (int i = front; i <= rear; i++)
48             printf("%d ", queue[i]);
```

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49     } else {
50         for (int i = front; i < MAX; i++)
51             printf("%d ", queue[i]);
52         for (int i = 0; i <= rear; i++)
53             printf("%d ", queue[i]);
54     }
55     printf("\n");
56 }
57
58 int main() {
59     int choice, value;
60     while (1) {
61         printf("\n1. Enqueue  2. Dequeue  3. Display  4. Exit\n");
62         printf("Enter choice: ");
63         scanf("%d", &choice);
64         switch (choice) {
65             case 1:
66                 printf("Enter value: ");
67                 scanf("%d", &value);
68                 enqueue(value);
69                 break;
70             case 2:
71                 dequeue();
72                 break;
73             case 3:
74                 display();
75                 break;
76             case 4:
77                 return 0;
78             default:
79                 printf("Invalid choice\n");
80         }
81     }
82 }
83
```