

### Practical 3

#### Source Code:-

```
#include <iostream>
using namespace std;

#define MAX_SIZE 100
class CircularQueue {
public:
    CircularQueue() {
        front = -1;
        rear = -1;
    }

    bool isFull() {
        return (rear + 1) % MAX_SIZE == front;
    }

    bool isEmpty() {
        return front == -1;
    }

    void enqueue(int data) {
        if (isFull()) {
            cout << "Queue is full!" << endl;
            return;
        }

        if (isEmpty()) {
            front = rear = 0;
        } else {
            rear = (rear + 1) % MAX_SIZE;
        }

        queue[rear] = data;
        cout << data << " enqueued.\n";
    }

    int dequeue() {
        if (isEmpty()) {
            cout << "Queue is empty!" << endl;
            return -1;
        }

        int data = queue[front];
        if (front == rear) {
            front = rear = -1;
        } else {
            front = (front + 1) % MAX_SIZE;
        }

        return data;
    }
}
```

```

void display() {
    if (isEmpty()) {
        cout << "Queue is empty!" << endl;
        return;
    }

    cout << "Queue elements: ";
    for (int i = front; i != rear; i = (i + 1) % MAX_SIZE) {
        cout << queue[i] << " ";
    }
    cout << queue[rear] << endl;
}

private:
    int queue[MAX_SIZE];
    int front, rear;
};

int main() {
    CircularQueue cq;
    int choice, data;

    while (true) {
        cout << "\n1. Enqueue\n2. Dequeue\n3. Display\n4. Exit\n";
        cout << "Enter your choice: ";
        cin >> choice;

        switch (choice) {
            case 1:
                cout << "Enter data to enqueue: ";
                cin >> data;
                cq.enqueue(data);
                break;
            case 2:
                data = cq.dequeue();
                if (data != -1) {
                    cout << data << " dequeued.\n";
                }
                break;
            case 3:
                cq.display();
                break;
            case 4:
                exit(0);
            default:
                cout << "Invalid choice!" << endl;
        }
    }

    return 0;
}

```

## Output:-

```
PS C:\Users\butte\OneDrive\Documents\CLG\DSA\practical> cd "c:\Users\butte\OneDrive\Documents\CLG\DSA\practical\"
if ($?) { g++ practical_3.cpp -o practical_3 } ; if ($?) { .\practical_3 }

1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 1
Enter data to enqueue: 12
12 enqueued.

1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 1
Enter data to enqueue: 24
24 enqueued.

1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 3
Queue elements: 12 24

1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 2
12 dequeued.

1. Enqueue
2. Dequeue
3. Display
4. Exit
Enter your choice: 
```