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#include <iostream>

using namespace std;

#define SIZE 5

class CircularQueue {
private:
    int cQueue[SIZE];

    int front, rear;

public:
    CircularQueue() {
        front = -1;
        rear = -1;
    }

    bool isFull() {
        return (rear == SIZE- 1 && front == 0) || (front == rear + 1);
    }

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

    void enqueue(int value) {
        if (isFull()) {
            cout << "Queue is FULL!!! Insertion is not possible!!!" << endl;
            return;
        }

        if (isEmpty()) {
            front = rear = 0;
        } else if (rear == SIZE- 1) {
            rear = 0;
        } else {
            rear++;
        }

        cQueue[rear] = value;

        cout << "Order " << value << " added to the queue." << endl;
    }

    void dequeue() {

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if (isEmpty()) {
    cout << "Queue is EMPTY!!! Deletion is not possible!!!" << endl;
    return;
}

cout << "Order " << cQueue[front] << " has been served." << endl;

if (front == rear) {
    front = rear = -1;
} else if (front == SIZE- 1) {
    front = 0;
} else {
    front++;
}
}

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

    cout << "Orders in the queue: ";

    int i = front;

    if (front <= rear) {
        while (i <= rear) {
            cout << cQueue[i] << " ";
            i++;
        }
    } else {
        while (i < SIZE) {
            cout << cQueue[i] << " ";
            i++;
        }
    }

    i = 0;

    while (i <= rear) {
        cout << cQueue[i] << " ";
        i++;
    }
}

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}

}

cout << endl;

}

};

int main() {
    CircularQueue cq;
    int choice, value;
    do {
        cout << "\nPizza Parlor Circular Queue Operations Menu:\n";
        cout << "1. Place Order\n";
        cout << "2. Serve Order\n";
        cout << "3. Display Orders\n";
        cout << "4. Exit\n";
        cout << "Select an option: ";
        cin >> choice;
        switch (choice) {
            case 1:
                cout << "Enter order number to place: ";
                cin >> value;
                cq.enqueue(value);
                break;
            case 2:
                cq.dequeue();
                break;
            case 3:
                cq.display();
                break;
            case 4:
                cout << "Exiting the program." << endl;
                break;
            default:
                cout << "Invalid option! Please try again." << endl;
        }
    }
}

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} while (choice != 4);  
return 0;  
}
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