

**Name : Farhan Ahmad**

**Sap id : 56193**

## **Lab Task #09**

```
#include <iostream>
using namespace std;
struct Node {
    int data;
    Node* next;
};
class Queue {
private:
    Node* front;
    Node* rear;
public:
    Queue() : front(NULL), rear(NULL) {}
    void enqueue(int item) {
        Node* newNode = new Node();
        newNode->data = item;
        newNode->next = NULL;
```

```

    if (rear == NULL) {
        front = rear = newNode;
    } else {
        rear->next = newNode;
        rear = newNode;
    }

}

int dequeue() {
    if (front == NULL) {
        cout << "Queue underflow! Cannot remove item." << endl;
        return -1;
    }

    int item = front->data;
    Node* temp = front;
    front = front->next;

    if (front == NULL) {
        rear = NULL;
    }
}

```

```

    }
    delete temp;
    return item;
}

bool isEmpty() {
    return front == NULL;
}

int count() {
    int size = 0;

    Node* temp = front;

    while (temp != NULL) {
        size++;
        temp = temp->next;
    }
    return size;
}

void clear() {

```

```
while (front != NULL) {  
    Node* temp = front;  
    front = front->next;  
    delete temp;  
}  
rear = NULL;  
}
```

```
void display() {  
    if (front == NULL) {  
        cout << "Queue is empty." << endl;  
        return;  
    }  
}
```

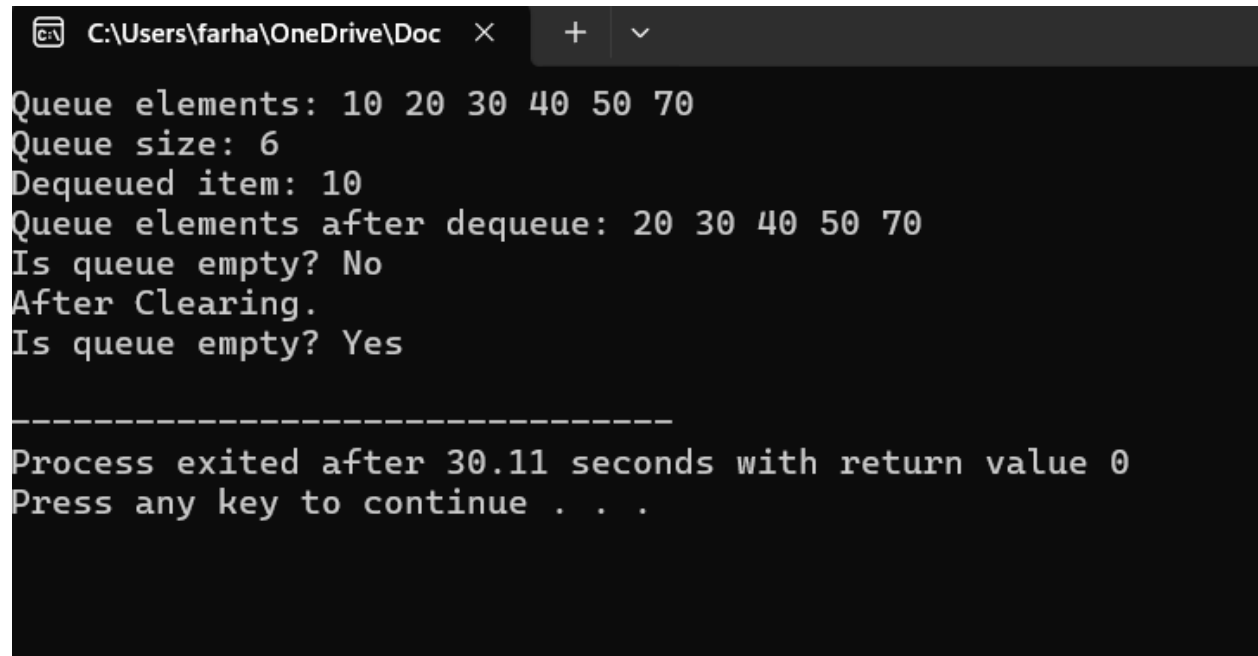
```
Node* temp = front;
```

```
while (temp != NULL) {  
    cout << temp->data << " ";  
    temp = temp->next;  
}  
cout << endl;  
}
```

```
~Queue() {  
    clear();  
}  
};
```

```
int main() {  
    Queue q;  
    q.enqueue(10);  
    q.enqueue(20);  
    q.enqueue(30);  
    q.enqueue(40);  
    q.enqueue(50);  
    q.enqueue(70);  
  
    cout << "Queue elements: ";  
  
    q.display();  
    cout << "Queue size: " << q.count() << endl;  
    cout << "Dequeued item: " << q.dequeue() << endl;  
    cout << "Queue elements after dequeue: ";  
    q.display();  
    cout << "Is queue empty? " << ((q.isEmpty()) ? "Yes" : "No") << endl;
```

```
cout<<"After Clearing. \n";  
q.clear();  
cout << "Is queue empty? " << ((q.isEmpty()) ? "Yes" : "No") <<  
endl;  
return 0;  
}
```



```
C:\Users\farha\OneDrive\Doc  X  +  v  
Queue elements: 10 20 30 40 50 70  
Queue size: 6  
Dequeued item: 10  
Queue elements after dequeue: 20 30 40 50 70  
Is queue empty? No  
After Clearing.  
Is queue empty? Yes  
  
-----  
Process exited after 30.11 seconds with return value 0  
Press any key to continue . . .
```