

Rajvaibhav Rahane  
17u283 223045  
SE-C Comp, Viit, Pune

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**Aim: To implement a Priority Queue .**

**CODE:**

```
/*
 *   @author    Rajvaibhav Rahane
 */
/*
 *   Program to implement priority queue for a hospital.
 *   places patients in lower priority -> first order.
 */
#include<iostream>
using namespace std;
class EmptyQueueException:public exception{
public:
    const char*what()const throw(){
        return "EmptyQueueException";
    }
};
struct Node{
    int priority;
    string name;
    Node *next;
};
void printNode(const Node * node){
    cout<<"Patient : "<<node->name<<" Priority : "<<node->priority<<endl;
}
class PriorityQueue{
    Node * front;
public:PriorityQueue(){
        front=NULL;
    }
    void enqueue(Node * nn);
    Node * dequeue();
    void printQueue();
};
void PriorityQueue::enqueue(Node * nn){
    if(front==NULL || nn->priority<front->priority){
        nn->next=front;
        front=nn;
    }else{
        Node *temp=front;
        while(temp->next!=NULL && temp->next->priority<=nn->priority){
            temp=temp->next;
        }
        nn->next=temp->next;
        temp->next=nn;
    }
}
Node* PriorityQueue::dequeue(){
    if(!front)
```

```

        throw EmptyQueueException();
        Node* removedNode=front;
        front=front->next;
        removedNode->next=NULL;
        return removedNode;
    }
    void PriorityQueue::printQueue() {
        Node * temp=front;
        while(temp) {
            printNode(temp);
            temp=temp->next;
        }
    }
    Node * createNode() {
        string patientName;int priority;
        cout<<"Enter Patient Name and Priority\t";
        cin>>patientName>>priority;
        Node * nn=new Node;
        nn->name=patientName;
        nn->priority=priority;
        nn->next=NULL;
        return nn;
    }
    void printMenu() {
        cout<<"1)Add Patient\t";
        cout<<"2)Treat Patient\t";
        cout<<"3)Display Queue\n";
        cout<<"4)Exit\tChoice : ";
    }
    int main() {
        int choice;
        PriorityQueue hospitalQueue;
        printMenu();
        do{
            cin>>choice;
            switch(choice) {
                case 1:{
                    hospitalQueue.enqueue(createNode());
                    break;
                }
                case 2:{
                    try{
                        Node *
removedNode=hospitalQueue.dequeue();
                        printNode(removedNode);
                        delete removedNode;
                    }catch(EmptyQueueException e){
                        cout<<"No Patients\n";
                    }
                    break;
                }
                case 3:{
                    hospitalQueue.printQueue();
                    break;
                }
                case 4:break;
            }
        } while(choice!=4);
    }
}

```

```

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

```

## Output:

```

rajrahane@visraj-lenovo-g500: ~/Desktop/c++/Lab1/FDS/Queue
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1/FDS/Queue$ g++ -o priorityQueue priorityQueue.cpp
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1/FDS/Queue$ ./priorityQueue
1)Add Patient 2)Treat Patient 3)Display Queue
4)Exit Choice : 3
1
Enter Patient Name and Priority rajrahane 5
2
Enter Patient Name and Priority jugalpatil 8
3
Enter Patient Name and Priority sumedhkulkarni 6
4
Enter Patient Name and Priority onkarkadan 2
5
Patient : onkarkadan Priority : 2
6
Patient : rajrahane Priority : 5
7
Patient : sumedhkulkarni Priority : 6
8
Patient : jugalpatil Priority : 8
9
Enter Patient Name and Priority shreyarathi 4
10
Patient : shreyarathi Priority : 4
11
Patient : rajrahane Priority : 5
12
Patient : sumedhkulkarni Priority : 6
13
Patient : jugalpatil Priority : 8
14
Enter Patient Name and Priority onkarkadan 6
15
Patient : shreyarathi Priority : 4
16
Patient : rajrahane Priority : 5
17
Patient : sumedhkulkarni Priority : 6
18
Patient : onkarkadan Priority : 6
19
Patient : jugalpatil Priority : 8
20
2 2 2 2 2
21
Patient : shreyarathi Priority : 4
22
Patient : rajrahane Priority : 5
23
Patient : sumedhkulkarni Priority : 6
24
Patient : onkarkadan Priority : 6
25
Patient : jugalpatil Priority : 8
26
No Patients
27
4
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1/FDS/Queue$

```