DS LAB 07 QUEUES

TASK 1

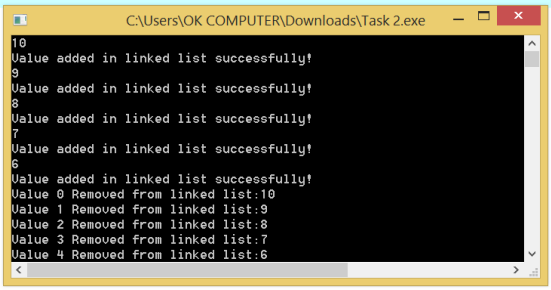
```cpp
#include<iostream>
using namespace std;
class Queue{
    public:
        int front;
        int rear;
        int size;
        int number;
        int array[100];
Queue(){
     size=100;
    front=-1;
    rear=-1;
    number=0;
}
bool QueueCapacity(){
if(number<size){
    return false;
}
else{
return true;
}
}
bool isEmpty(){
    if(number>0){
        return false;}
    else
        return true;
}
void AddMember(int x){
    if(!QueueCapacity()){
    rear=(rear+1)%size;
    array[rear]=x;
    number++;
}
}
int RemoveMember(){

    if(!isEmpty()){
    front=(front+1)%size;
        int x=array[front];
        number--;
        return x;
    }
}
};
int main(){
    Queue q1;
    int x;
    for(int i=0;i<5;i++){
        cin>>x;
        q1.AddMember(x);
        cout<<"Value added in queue successfully!"<<endl;
    }
    for(int i=0;i<5;i++){
        cout<<"Value "<<i<<" Removed:"<<q1.RemoveMember()<<endl;

}
```

```
C:\Users\OK COMPUTER\Downloads\Task 1.exe
1
Value added in queue successfully!
2
Value added in queue successfully!
3
Value added in queue successfully!
4
Value added in queue successfully!
5
Value added in queue successfully!
Value 0 Removed:1
Value 1 Removed:2
Value 2 Removed:3
Value 3 Removed:4
Value 4 Removed:5

--------------------------------
Process exited after 3.112 seconds with return value 0
Press any key to continue . . .
```

TASK 2

```cpp
#include<iostream>
using namespace std;
class node{
public:
int data;
node *next;
node *front;
node *rear;
int size;
int number;
node(){
     size=100;
    front=NULL;
    rear=NULL;
    number=0;
    next=NULL;
    data=0;
}
bool QueueCapacity(){
if(number<size){
    return false;
}
else{
return true;
}
}
void AddMember(int value){
    node *temp=new node();
    if(rear==NULL){
     node *temp=new node();
     if(rear==NULL){
         rear=temp;
         rear->next=NULL;
         rear->data=value;
         front=rear;
     }
     else{
         rear->next=temp;
         temp->data=value;
         temp->next=NULL;
         rear=temp;
     }
     number++;
}
int RemoveMember(){
if(front==NULL){
    cout<<"Queue Underflow!";
}
 int x=front->data;
 front=front->next;
 number--;
 return x;
}
};
```

```cpp
}
int x=front->data;
front=front->next;
number--;
return x;
}
};
int main(){
    node n1;
    int x;
for(int i=0;i<5;i++){
        cin>>x;
        n1.AddMember(x);
        cout<<"Value added in linked list successfully!"<<endl;
    }
    for(int i=0;i<5;i++){
        cout<<"Value "<<i<<" Removed from linked list:"<<n1.RemoveMember()<<endl;

}}
```



TASK 3

Priority Queue.cpp | Task 1.cpp | Task 2.cpp | Stack with array.cpp

```cpp
#include <iostream>
using namespace std;
class node{
public:
   int priority;
   int data;
   node *next;
   node(){
    priority=0;
    data=0;
    next=NULL;
   }
};
class queue{
      node *front;
   public:
    queue(){
         front= NULL;
     }
      void insert(int i, int p) {
         node *temp,*q;
         temp=new node;
         temp->data = i;
         temp->priority=p;
         if (front == NULL || p < front->priority) {
            temp->next= front;
            front = temp;
         } else {
            q = front;
         } else {
            q = front;
            while (q->next != NULL && q->next->priority <= p)
               q = q->next;
               temp->next = q->next;
               q->next = temp;
         }
      }
      void del() {
         node *temp;
         if(front == NULL)
            cout<<"Queue Underflow\n";
         else {
            temp = front;
            cout<<"Deleted item is: "<<temp->data<<endl;
            front = front->next;
            delete temp;
         }
      }
      void show(){
         node *p;
         p= front;
         if (front == NULL)
            cout<<"Queue is empty\n";
         else {
            cout<<"The Entered Queue is"<<endl;
            while(p != NULL) {
               cout<<"Priority:"<<p->priority<<" Data:"<<p->data<<endl;
               p = p->next;
            }
         }
      }
};
int main(){
    queue q;
    q.insert(16,1);
    q.insert(15,3);
    q.insert(12,2);
    q.insert(10,5);
    q.insert(11,4);
    q.show();
}
```

C:\Users\OK COMPUTER\Desktop\Semester 3\DS Lab\Lab 8 Queues\Priority Queue.exe

```
The Entered Queue is
Priority:1 Data:16
Priority:2 Data:12
Priority:3 Data:15
Priority:4 Data:11
Priority:5 Data:10

--------------------------------
Process exited after 0.04111 seconds with return value 0
Press any key to continue . . .
```