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\* circualeQueue.cpp

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**#include**<iostream>

**using** **namespace** std;

**struct** Patient

{

**int** id;

string name,city,disease;

};

//class

**class** Queue

{

**private**:

**int** front,rear;

Patient p[20];

**public**:

**Queue**(){

front=-1;

rear=-1;

}

**void** **enqueue**(**int**);

**void** **dequeue**(**int**);

**void** **display**(**int**);

**bool** **validation**(**int**);

};

//definition to add new patient

**void** **Queue::enqueue**(**int** n)

{

**if**((front+1)%n==((rear+1)%n)+1)

{

cout<<"Overflow condition!!!!"<<**endl**;

**return**;

}

**if**(front==-1) //if it is first element to be inserted

front=0;

rear=(rear+1)%n; //increment rear pointer

//Input details at rear position

cout<<"Enter details:";

**bool** validate; //to validate patient id

**do**{

cout<<"Id:";

cin>>p[rear].id;

validate=validation(rear); //validation of id

}**while**(!validate);

cin.ignore();

cout<<"Name:";

**getline**(cin,p[rear].name);

cout<<"City:";

**getline**(cin,p[rear].city);

cout<<"Disease:";

**getline**(cin,p[rear].disease);

cout<<"Record added....."<<**endl**;

}

//validation of patient id

**bool** **Queue::validation**(**int** i)

{

**for**(**int** j=i-1;j>=front;j--)

{

**if**(p[rear].id==p[j].id)

{

cout<<"Id should be unique"<<**endl**;

**return** **false**;

}

}

**return** **true**;

}

//definition to discharge a patient

**void** **Queue::dequeue**(**int** n)

{

**if**(front==-1)

{

cout<<"Underflow condition!!!"<<**endl**;

**return**;

}

**int** temp=front;//to display record of discharged patient

**if**(front==rear)

front=rear=-1;//if queue has only 1 element

//normal deletion

**else**

front=(front+1)%n;

cout<<"Patient discharged...."<<**endl**;

//display details of discharged patient

cout<<"Details of discharged patient:"<<**endl**;

cout<<"Id:"<<p[temp].id<<**endl**<<"Name:"<<p[temp].name<<**endl**<<"City:"<<p[temp].city<<**endl**;

}

//definition for display

**void** **Queue::display**(**int** n)

{

**if**(front==-1)

{

cout<<"No records available"<<**endl**;

**return**;

}

**else** **if**(front>rear)

{

cout<<"Id\tName\t\tCity\tDisease"<<**endl**;

**for**(**int** i=front;i<n;i++)

cout<<p[i].id<<"\t"<<p[i].name<<"\t"<<p[i].city<<"\t"<<p[i].disease<<**endl**;

**for**(**int** i=0;i<=rear;i++)

cout<<p[i].id<<"\t"<<p[i].name<<"\t"<<p[i].city<<"\t"<<p[i].disease<<**endl**;

}

**else**

{

cout<<"Id\tName\t\tCity\tDisease"<<**endl**;

**for**(**int** i=front;i<=rear;i++)

cout<<p[i].id<<"\t"<<p[i].name<<"\t"<<p[i].city<<"\t"<<p[i].disease<<**endl**;

}

}

//driver function

**int** **main**()

{

Queue queue;

**int** n;

**do**

{

cout<<"Enter valid number of patients:";

cin>>n;

}**while**(n<1||n>20);

**int** choice;

**do**

{

cout<<"--------------------"<<**endl**;

cout<<"1:Admit new Patient"<<**endl**<<"2:Discharge patient"<<**endl**<<"3:Display all patients"<<**endl**<<"4:Exit"<<**endl**;

cout<<"Enter choice:";

cin>>choice;

cout<<"--------------------"<<**endl**;

**switch**(choice)

{

**case** 1:

queue.enqueue(n);

**break**;

**case** 2:

queue.dequeue(n);

**break**;

**case** 3:

queue.display(n);

**break**;

**case** 4:

cout<<"Thank you...";

**break**;

}

}**while**(choice!=4);

**return** 0;

}

**Output:**

Enter valid number of patients:-3

Enter valid number of patients:5

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Underflow condition!!!

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

No records available

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:101

Name:abcd abcd abcd

City:abcd

Disease:abcd

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

101 abcd abcd abcd abcd abcd

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:102

Name:pqrs pqrs pqrs

City:pqrs

Disease:pqrs

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:101

Id should be unique

Id:103

Name:xyz xyz xyz

City:xyz

Disease:xyz

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

101 abcd abcd abcd abcd abcd

102 pqrs pqrs pqrs pqrs pqrs

103 xyz xyz xyz xyz xyz

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:101

Name:abcd abcd abcd

City:abcd

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

102 pqrs pqrs pqrs pqrs pqrs

103 xyz xyz xyz xyz xyz

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:104

Name:wxyz wxyz wxyz

City:wxyz

Disease:wxyz

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:104

Id should be unique

Id:105

Name:sde sde sde

City:sde

Disease:sde

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

102 pqrs pqrs pqrs pqrs pqrs

103 xyz xyz xyz xyz xyz

104 wxyz wxyz wxyz wxyz wxyz

105 sde sde sde sde sde

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:110

Name:asdf asdf asdf

City:asdf

Disease:asdf

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

102 pqrs pqrs pqrs pqrs pqrs

103 xyz xyz xyz xyz xyz

104 wxyz wxyz wxyz wxyz wxyz

105 sde sde sde sde sde

110 asdf asdf asdf asdf asdf

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Overflow condition!!!!

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:102

Name:pqrs pqrs pqrs

City:pqrs

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

103 xyz xyz xyz xyz xyz

104 wxyz wxyz wxyz wxyz wxyz

105 sde sde sde sde sde

110 asdf asdf asdf asdf asdf

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:1

--------------------

Enter details:Id:111

Name:new new new

City:new

Disease:new

Record added.....

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

Id Name City Disease

103 xyz xyz xyz xyz xyz

104 wxyz wxyz wxyz wxyz wxyz

105 sde sde sde sde sde

110 asdf asdf asdf asdf asdf

111 new new new new new

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:103

Name:xyz xyz xyz

City:xyz

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:104

Name:wxyz wxyz wxyz

City:wxyz

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:105

Name:sde sde sde

City:sde

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:110

Name:asdf asdf asdf

City:asdf

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Patient discharged....

Details of discharged patient:

Id:111

Name:new new new

City:new

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Underflow condition!!!

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:2

--------------------

Underflow condition!!!

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:3

--------------------

No records available

--------------------

1:Admit new Patient

2:Discharge patient

3:Display all patients

4:Exit

Enter choice:4

--------------------

Thank you...