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**ROLL NO:-SECOA115**

**ASSIGNMENT NO:-10**

**AIM** **:-** A double-ended queue(deque) is a linear list in which additions and deletions may be made at either end. Obtain a data representation mapping a deque into a one-dimensional array. Write C++ program to simulate deque with functions to add and delete elements from either end of the deque.

**PROGRAM:-**

#include<iostream>

using namespace std;

class queue

{

int q[60],temp[60];

int front,rear,i,j,a;

public:

queue()

{

front=-1;

rear=-1;

}

int is\_queue\_empty()

{

if(front==-1&&rear==-1)

return 1;

else

return 0;

}

int is\_queue\_full()

{

if(rear==60)

return 1;

else

return 0;

}

void accept()

{

char ch;

do

{

cout<<"enter elements in queue\n";

cin>>a;

if(front==-1&&rear==-1)

{//cout<<"im in if\n";

front++;

q[front]=a;

rear++;

cout<<"continue?\n press y to continue\n";

cin>>ch;

}

else

{//cout<<"im in else\n";

rear++;

q[rear]=a;

cout<<"continue?\n press y to continue\n";

cin>>ch;

}

}while(ch=='y'||ch=='Y');

}

void enquefront()

{

int x;

if(is\_queue\_full())

{

cout<<"queue is full\n";

}

else

{

int a;

rear++;

a=rear;

for(int i=0;a!=0;a--)

{

q[a]=q[a-1];

}

//front++;

cout<<"enter element to insert at front\n";

cin>>x;

// cout<<"front="<<front;

q[front]=x;

}

}

void enquerear()

{

int x;

if(is\_queue\_full())

{

cout<<"queue is full\n";

}

else

{

rear++;

cout<<"enter element to insert at rear\n";

cin>>x;

q[rear]=x;

}

}

void dequefront()

{

if(is\_queue\_empty())

cout<<"queue is empty\n";

else

{ front++;

}

}

void dequerear()

{

if(is\_queue\_empty())

cout<<"queue is empty\n";

else

rear--;

}

void display()

{

int a;

a=front;

cout<<"Elements in queue are:\n";

for(i=a;i<=rear;i++)

{

cout<<q[i]<<" ";

}

cout<<endl;

}

};

int main()

{

queue a1,a2,a3;

int ch,in;

a1.accept();

a1.display();

do

{

cout<<"\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";

cout<<"enter\n1.enqueue front \n2.enqueue rear \n3.dequeue front \n4.dequeue rear\n";

cout<<"\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\n";

cin>>in;

switch(in)

{

case 1:

a1.enquefront();

a1.display();

break;

case 2:

a1.enquerear();

a1.display();

break;

case 3:

a1.dequefront();

a1.display();

break;

case 4:

a1.dequerear();

a1.display();

break;

}

cout<<"press 1 to continue else 0";

cin>>ch;

}while(ch==1);

return 0;

}

**OUTPUT:**

enter elements in queue

2

continue?

press y to continue

y

enter elements in queue

3

continue?

press y to continue

y

enter elements in queue

4

continue?

press y to continue

n

Elements in queue are:

2 3 4

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

enter

1.enqueue front

2.enqueue rear

3.dequeue front

4.dequeue rear

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

1

enter element to insert at front

1

Elements in queue are:

1 2 3 4

press 1 to continue else 01

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

enter

1.enqueue front

2.enqueue rear

3.dequeue front

4.dequeue rear

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

2

enter element to insert at rear

5

Elements in queue are:

1 2 3 4 5

press 1 to continue else 01

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

enter

1.enqueue front

2.enqueue rear

3.dequeue front

4.dequeue rear

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

3

Elements in queue are:

2 3 4 5

press 1 to continue else 01

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

enter

1.enqueue front

2.enqueue rear

3.dequeue front

4.dequeue rear

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

4

Elements in queue are:

2 3 4

press 1 to continue else 0 0