EXEPERIMENT NO.4.3

DOUBLY ENDED QUEUE:

```
#include<iostream>

#define max 20

using namespace std; class
Dqueue
{       int a[max],front1,rear1,front2,rear2,n; public:
        void init(){ int i; for(i=0;
                i<n; i++){ a[i]=0;
}
}

        bool isFull(){ return rear1 ==
                rear2-1;
}

        bool isEmpty1(){ return
                rear1<front1;
}

        bool isEmpty2(){ return
                rear2>front2;
}



        void enqueue(int ch){ int
                temp;
                if(!isFull()){ cout<<"Enter the Data
                        :";
          cin>>temp;
                        if(ch == 1){ a[++rear1]=temp;
} else{ a[--rear2]=temp;
}
}
else{
                            cout<<"Queue OverFlow"<<endl;
}
}

        void dequeue(int ch){
                int temp; if(ch
```

```
                == 1){
                if(!isEmpty1()){
                cout<<"Value
                :"<<a[front1++
                ]<<endl;
}
else{
                        cout<<"Queue UnderFlow "<<endl;
}
} else{ if(!isEmpty2()){ cout<<"Value :"<<a[front2--]<<endl;
}
else{
                        cout<<"Queue UnderFlow "<<endl;
}
}
} void display(){
int i;
cout<<"Value :"<<endl; for(i=front1;i<=front2;i++)
                cout<< i <<"---->"<<a[i]<<endl;
}

void menu(){
      int ch,ch1;
cout<<"Enter Size of Array :"; cin>>n;
init();
rear1=-1; front1=0; front2=n-1;
                rear2=n;
         do{            cout<<"******MENU******"<<endl
                         <<"1.Enqueue"<<endl
                <<"2.Dequeue"<<endl
                    <<"3.Display"<<endl
                       <<"4.Exit"<<endl
                 <<"Enter Your Choice :";          cin>>ch;

              switch(ch){
              case 1:ch1=0;
                              do{
                                        cout<<"\t\t******MENU******"<<endl
                                   <<"\t\t1.Left"<<endl
                                  <<"\t\t2.Right"<<endl

                                        <<"\t\tEnter Your
                                        Choice: "; cin>>ch1;
                               }while(ch1!=1 && ch1!=2);
```

```
                                    enqueue(ch1);
                        break;
          case 2:ch1=0;
                                    do{
                                cout<<"\t\t******MENU******"<<endl
                                    <<"\t\t1.Left"<<endl
                                    <<"\t\t2.Right"<<endl
<<"\t\tEnter Your Choice: ";
                                cin>>ch1;
                              }while(ch1!=1 && ch1!=2);
                                    dequeue(ch1);
                             break;
          case 3:display();
                              break;
                case 4:
                        break;
          default:cout<<"Wrong Option \n";
                }
        }while(ch!=4);
          } }q;

int main()
{
q.menu();
}
```

OUTPUT:

```
Enter Size of Array :5
******MENU******
1.Enqueue
2.Dequeue
3.Display
4.Exit
Enter Your Choice :1
******MENU******
1.Left
2.Right
Enter Your Choice: 1
Enter the Data :10
******MENU******
1.Enqueue
2.Dequeue
```

```
3.Display
4.Exit
Enter Your Choice :1
******MENU******
        1.Left
        2.Right
Enter Your Choice: 1
Enter the Data :20
******MENU******
1.Enqueue
2.Dequeue
3.Display
4.Exit
Enter Your Choice :1
******MENU******
        1.Left
        2.Right
Enter Your Choice: 1
Enter the Data :30
******MENU******
1.Enqueue
2.Dequeue
3.Display
4.Exit
Enter Your Choice :3 Value :
0---->10
1---->20
2---->30
3---->0
4---->0
******MENU******
1.Enqueue
2.Dequeue
3.Display
4.Exit
Enter Your Choice :2
******MENU******
        1.Left
        2.Right
Enter Your Choice: 1
Value :10
******MENU******
1.Enqueue
```

```
2.Dequeue
3.Display
4.Exit
Enter Your Choice :1
******MENU******
            1.Left
            2.Right
Enter Your Choice: 2
Enter the Data :40
******MENU******
1.Enqueue
2.Dequeue
3.Display
4.Exit
Enter Your Choice :3 Value :
1---->20
2---->30
3---->0
4---->40
******MENU******
1.Enqueue
2.Dequeue
3.Display
4.Exit
Enter Your Choice :2
                  ******MENU******
            1.Left
            2.Right
                  Enter Your Choice: 2 Value
:40
```