//CODE:

```
#include<iostream>
#include<deque>
using namespace std;
void add_front(deque<int>&deque,int element)
{
   deque.push_front(element);
   cout<<"Element "<<element<<" added in front of deque"<<endl;
}
void add_rear(deque<int>&deque,int element)
{
   deque.push_back(element);
   cout<<"Element "<<element<<" added in back of deque"<<endl;
}
void delete_front(deque<int>&deque)
{
   if (deque.empty())
   {
      int deletedelement=deque.front();
      deque.pop_front();
      cout<<"Element "<<deletedelement<<" deleted from front end of queue"<<endl;
   }
   else
   {
    cout<<"Deque is empty...cnnnot delete element"<<endl;
   }
}
void delete_rear(deque<int>&deque)
{
   if (deque.empty())
   {
```

```
        int deletedelement=deque.back();
        deque.pop_back();
        cout<<"Element "<<deletedelement<<" deleted from rear end of queue"<<endl;
    }
    else
    {
     cout<<"Deque is empty...cnnnot delete element"<<endl;
    }
}
void display_deque(const deque <int> &deque)
{
    if(deque.empty())
    {
        cout<<"Deque is empty"<<endl;
    }
    else
    {
        cout<<"Deque contents"<<endl;
        for(int element:deque)
        {
           cout<<endl;
        }
    }
}
int main()
{
    deque<int>deque;
    int choice;
    do{
        cout<<"Deque Simulation"<<endl;
        cout<<"1. Add to front"<<endl;
```

```
cout<<"2. Add to rear"<<endl;
cout<<"3. Delete from front"<<endl;
cout<<"4. Delete from rear"<<endl;
cout<<"5. Display queue"<<endl;
cout<<"6.Exiting"<<endl;
cout<<"Enter choice: ";
cin>>choice;
switch (choice)
{
case 1:
 {
   int element;
   cout<<"Enter the element to add: ";
   cin>>element;
   add_front(deque,element);
   break;
 }
 case 2:
 {
   int element;
   cout<<"Enter element";
   cin>>element;
   add_rear(deque,element);
   break;
 }
 case 3:
 {
   delete_front(deque);
   break;
 }
 case 4 :
```

```
        {
          delete_rear(deque);
          break;
        }
        case 5:
        {
          display_deque(deque);
          break;
        }
        case 6:
        {
          cout<<"Exiting"<<endl;
          break;
        }

      default:
      {
       cout<<"Invalid choice"<<endl;
      }

      }
    }
    while (choice!=6);
    return 0;
}
```

//OUTPUT:

```
Deque Simulation
1. Add to front
2. Add to rear
3. Delete from front
4. Delete from rear
5. Display queue
6.Exiting
Enter choice: 1
Enter the element to add: 5
Element 5 added in front of deque
```

```
Deque Simulation
1. Add to front
2. Add to rear
3. Delete from front
4. Delete from rear
5. Display queue
6.Exiting
Enter choice: 2
Enter element 3
Element 3 added in back of deque
```

```
Deque Simulation
1. Add to front
2. Add to rear
3. Delete from front
4. Delete from rear
5. Display queue
6.Exiting
Enter choice: 3
Deque is empty...cnnnot delete element
```

```
Deque Simulation
1. Add to front
2. Add to rear
3. Delete from front
4. Delete from rear
5. Display queue
6.Exiting
Enter choice: 4
Deque is empty...cnnnot delete element
```

```
Deque Simulation
1. Add to front
2. Add to rear
3. Delete from front
4. Delete from rear
5. Display queue
6.Exiting
Enter choice: 5
Deque contents
```

```
Deque Simulation
1. Add to front
2. Add to rear
3. Delete from front
4. Delete from rear
5. Display queue
6.Exiting
Enter choice: 6
Exiting
```