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CODE:

The Code is Divided into 3 files-

1) UI File-employeeUI.cpp,

2) Class File-employee.cpp and

3) the DLL Library file created by me-linked_list.cpp

**The DLL Library is implemented as a double-Ended-Queue STL*

UI File-

```
#include "employee.cpp"
void printMenu() {
    cout<<"1)Insert Employee Data at Begin\t";
    cout<<"2)Insert Employee Data at Index\t";
    cout<<"3)Insert Employee Data at End\n";
    cout<<"4)Delete Employee at Start\t";
    cout<<"5)Delete Employee at Index\t";
    cout<<"6)Delete Employee at End\n";
    cout<<"7)Print Number of Employees\t";
    cout<<"8)Display Employee Details\t";
    cout<<"9)Exit. Choice : ";
}
int main() {
    int choice, index;
    Employee *employee;
    LinkedList<Employee> myCompany;
    do {
        printMenu();
        scanf("%d%c", &choice);
        switch(choice) {
            case 1: {
                employee=new Employee();
                cin>>*employee;
                myCompany.addFirst(employee);
                break;
            }
            case 2: {
                cout<<"Index : ";scanf("%d%c", &index);
                employee=new Employee();
                cin>>*employee;
                try {
                    myCompany.add(index, employee);
                } catch(exception &e) {
                    delete employee;
                    cout<<e.what()<<" was thrown\n";
                }
                break;
            }
            case 3: {
                employee=new Employee();
                cin>>*employee;
                myCompany.addLast(employee);
                break;
            }
            case 4: {
                try {
                    employee=myCompany.removeFirst();
                }
            }
        }
    } while(choice != 9);
}
```

```

        cout<<"Employee removed : "<<*employee<<endl;
        delete employee;
    }catch(NoSuchElementException &e){
        cout<<e.what()<<" was thrown\n";
    }
    break;
}
case 5:{
    try{
        cout<<"Index : ";cin>>index;
        employee=myCompany.remove(index);
        cout<<"Employee removed : "<<*employee<<endl;
        delete employee;
    }catch(exception &e){
        cout<<e.what()<<" was thrown\n";
    }
    break;
}
case 6:{
    try{
        employee=myCompany.removeLast();
        cout<<"Employee removed : "<<*employee<<endl;
        delete employee;
    }catch(NoSuchElementException &e){
        cout<<e.what()<<" was thrown\n";
    }
    break;
}
case 7:{
    cout<<"Number of
Employees:"<<myCompany.size()<<endl;
    break;
}
case 8:{
    cout<<myCompany<<endl;
    break;
}
case 9:{
    while(myCompany.size()>0){
        Employee* emp=myCompany.removeFirst();
        delete emp;
    }
    break;
}
default:cout<<"Invalid Input Re-enter\n";
    }
}while(choice!=9);

return 0;
}

```

Class File-

```

#include "linked_list.cpp"
//-----class Employee-----
class Employee{
    char *name;
    unsigned int empId;
    char *department;
    char *designation;
    char *phone;
}

```

```

public:
    Employee() {
        name=department=designation=phone=NULL;
        empId=-1;
    }
    friend istream & operator>>(istream &in,Employee&);
    friend ostream & operator<<(ostream &,const Employee&);
    ~Employee() {
        cout<<"destructor called\n";
    }
};

int calculateLength(char *str){
    int i=0;
    if(str!=NULL){
        for(i=0;str[i]!='\0';i++);
    }
    return i;
}

istream & operator>>(istream &in,Employee & s){
    s.name=new char[30];
    s.department=new char[11];
    s.designation=new char[11];
    s.phone=new char[11];

    cout<<"Name : ";scanf("%[^\\n]%%*c",s.name);
    //scan name
    s.name[calculateLength(s.name)]='\0';

    cout<<"ID : ";scanf("%u%%*c",&s.empId);
    //scan empId
    cout<<"Department : ";scanf("%[^\\n]%%*c",s.department);s.department[10]='\0'; //scan
    department
    s.department[calculateLength(s.department)]='\0';

    cout<<"Designation : ";scanf("%[^\\n]%%*c",s.designation);s.designation[10]='\0'; //scan
    designation
    s.designation[calculateLength(s.designation)]='\0';

    cout<<"Phone : ";scanf("%10c",s.phone);s.phone[10]='\0';
    //scan phone number
    s.phone[calculateLength(s.phone)]='\0';
    return in;
}

ostream & operator<<(ostream &out,const Employee& s){
    out<<s.name<<" ";
    out<<s.empId<<" ";
    out<<s.department<<" ";
    out<<s.designation<<" ";
    cout<<s.phone;
    return out;
}

```

Library File-

The Library File Code is included in a separate file-DLL_Library.docx.Pl have a look at it.

Output:

```
rajrahane@visraj-lenovo-g500: ~/Desktop/c++/Lab1
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 6
Employee removed : shreya rathl 223046 comp student 8209481226
destructor called
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 7
Number of Employees:2
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 8
[[raj rahane 223045 comp student 7083496708],
[jugal patil 223042 comp student 7777777777]]
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 5
Index : 0
Employee removed : raj rahane 223045 comp student 7083496708
destructor called
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 7
Number of Employees:1
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 8
[[jugal patil 223042 comp student 7777777777]]
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 4
Employee removed : jugal patil 223042 comp student 7777777777
destructor called
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 7
Number of Employees:0
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 8
Empty Linked-List
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 9
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1$
```

```
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1$ g++ -o employeeUI employeeUI.cpp
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1$ ./employeeUI
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 1
Name : raj rahane
ID : 223045
Department : comp
Designation : student
Phone : 7083496708
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 3
Name : shreya rathl
ID : 223046
Department : comp
Designation : student
Phone : 8209481226
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 2
Index : 1
Name : jugal patil
ID : 223042
Department : comp
Designation : student
Phone : 7777777777
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 7
Number of Employees:3
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 8
[[raj rahane 223045 comp student 7083496708],
[jugal patil 223042 comp student 7777777777],
[shreya rathl 223046 comp student 8209481226]]
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start      5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees      8)Display Employee Details      9)Exit. Choice : 6
Employee removed : shreya rathl 223046 comp student 8209481226
destructor called
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
```

```
rajrahane@visraj-lenovo-g500: ~/Desktop/c++/Lab1
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1$ g++ -o employeeUI employeeUI.cpp
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1$ ./employeeUI
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 4
NoSuchElementException was thrown
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 6
NoSuchElementException was thrown
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 2
Index : 1
Name : raj rahane
ID : 223045
Department : comp
Designation : student
Phone : 7883496708
destructor called
Index out of Bounds: was thrown
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 5
Index : 0
Index out of Bounds: was thrown
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 99
Invalid Input Re-enter
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 8
Empty Linked-List
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 7
Number of Employees:0
1)Insert Employee Data at Begin 2)Insert Employee Data at Index 3)Insert Employee Data at End
4)Delete Employee at Start 5)Delete Employee at Index 6)Delete Employee at End
7)Print Number of Employees 8)Display Employee Details 9)Exit. Choice : 9
rajrahane@visraj-lenovo-g500:~/Desktop/c++/Lab1$
```