GTU Department of Computer Engineering CSE 222- Spring 2020 Homework 3 Report

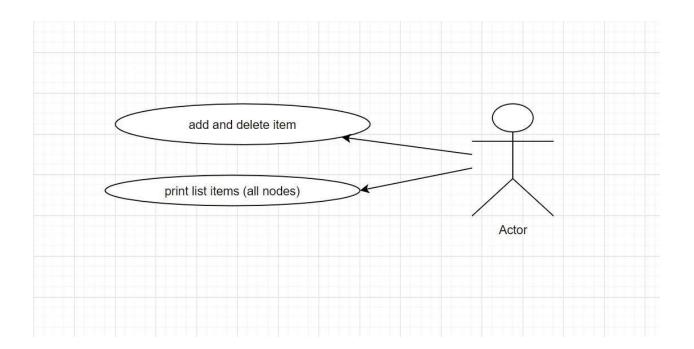
Fatih OĞUZ 151044025

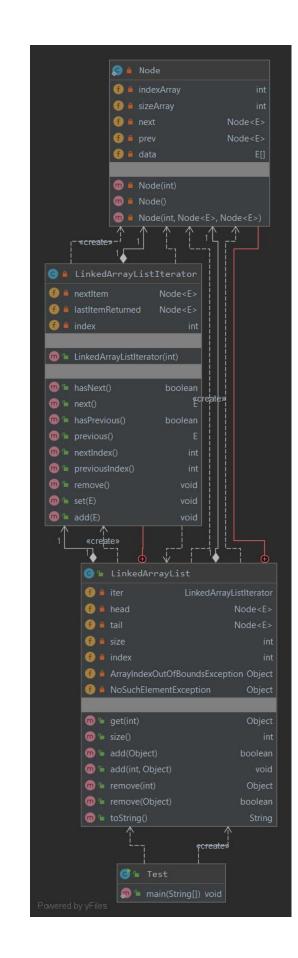
PART1

1. SYSTEM REQUIREMENTS

- 1-) Double linked list must be defined.
- 2-) It should perform double linked list methods faster with the help of list iterator
- 3-) Class hierarchy should not be used. Node class should be written.
- 4-) Array definition in Node class
- 5-) If the elements of the array run out, the node is removed.
- 6-) If the array exceed size, the element to be added is added to the newly created node
- 7-) When the element is deleted, the elements are shifted so that there is no space in array

2-) USE CASE DIAGRAM AND CLASS DIAGRAMS





3-) PROBLEM SOLUTION APPROACH

Step1: Implemet a Node<E> class and to be generic data in class.

Step2: Implement a Linked List Iterator class for linkedlist class use for do faster its methods.

Step3: Should extends AbstractList and implements List because there is generic array in Node class

4-) Test Cases & Running and Results

Add(index,item):

Can add elements to the middle?

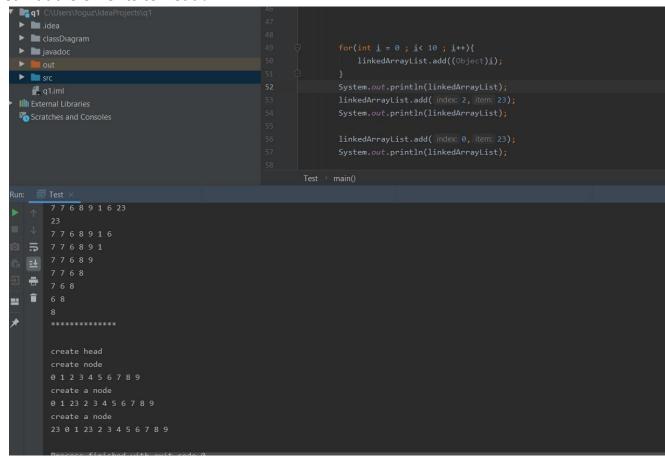
```
LinkedArrayList linkedArrayList = new LinkedArrayList<Integer>();

linkedArrayList.add(5);
 linkedArrayList.add(6);
 linkedArrayList.add( index: 1, item: 7);
 System.out.println(linkedArrayList);

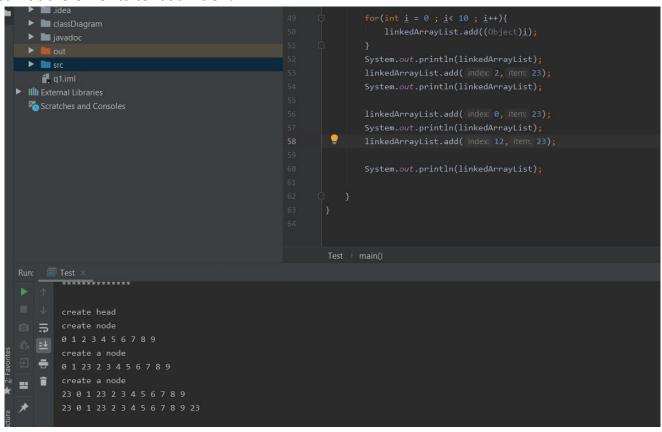
}
Test > main()
Test ×

"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program File 5 7 6
```

Can add elements to head?



Can add elements to last index?



When the array is full, add the new node and assign the last element to the first index of the new array

+ add(E item) metodu

Boolean Remove(E object)

```
System.out.println(linkedArrayList.remove((Object)0));
System.out.println(linkedArrayList.remove((Object)0));
System.out.println(linkedArrayList);

Test > main()

Test ×

create head
5 7 6

create node
5 7 6 6 8 9 0 1 6 23

create a node
5 7 6 6 8 9 0 1 6 7 23

true
5 7 6 6 8 9 1 6 7 23
```

E remove(int index) head, middle, last

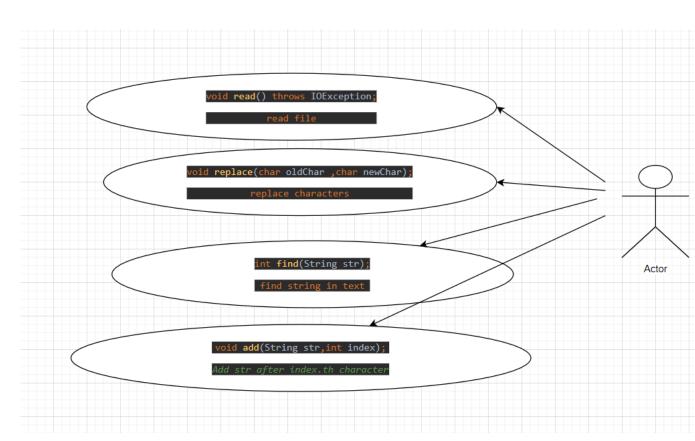
```
System.out.println(linkedArrayList);
           System.out.println(linkedArrayList.remove((Object)0));
           System.out.println(linkedArrayList);
           System.out.println(linkedArrayList.remove(index: 3));
           System.out.println(linkedArrayList);
           System.out.println(linkedArrayList.remove(index: 0));
           System.out.println(linkedArrayList);
           System.out.println(linkedArrayList.remove(index: 7));
           System.out.println(linkedArrayList);
    create a node
盐
    5 7 6 8 9 1 6 7 23
î
    7 6 8 9 1 6 7 23
    7689167
```

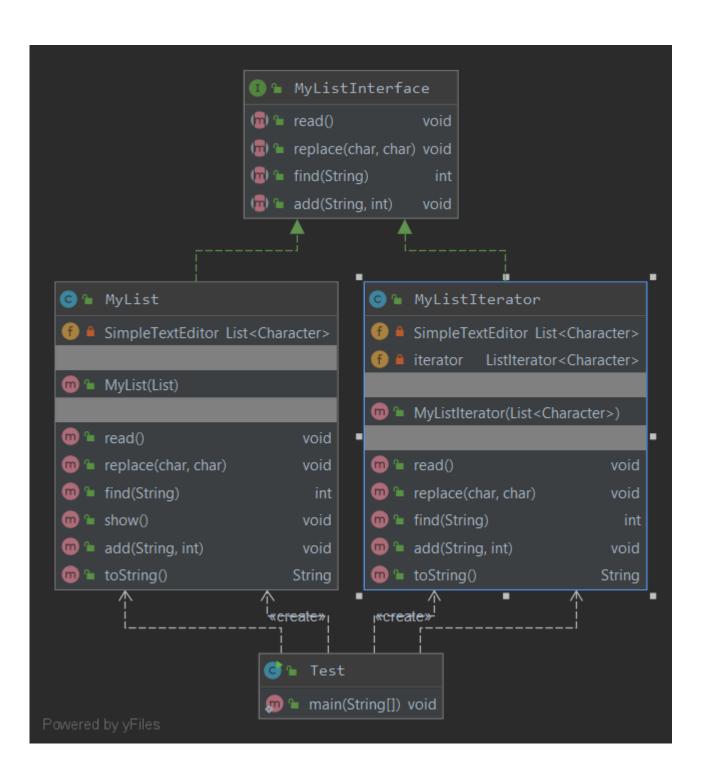
PART2

1. SYSTEM REQUIREMENTS

- 1-) Reads from a text. The text he / she read should be linked to the character-character linked list.
- 2-) It should add to the created linkedlist, starting from the specified letter position .
- 3-) Finding the desired subtext in the linked list should return the location where it started.
- 4-) Convert a given character in linkedlist text to another character (in all text)

2-) USE CASE DIAGRAM AND CLASS DIAGRAMS





3-) PROBLEM SOLUTION APPROACH

Since the character will change in the replace method, one character must be assigned to each node.(for do something the easy way).

So while in the text the lines should be split into characters and then the list should be assigned.

Starting from the index given for the add method, character character list is assigned. java add method makes scrolling automatically

The string given in the find method is taken with the char char method and compared with the list. The index of the first element is returned

Since the linkedList and arrayList methods come from the list interface, I have defined the MyList class for these in the form of MyListIterator for iterator

Since the methods for the 4 types are the same, I have defined these methods is List Interface.

I created a logger file on my test class and wrote the run times of the methods with the same parameter for 4 types.

4-) Test Cases & Running and Results

```
simpleTextEditor.replace( oldChar: 'a', newChar: 'A');
    simpleTextEditor.add( str: "FATIH OGUZ", index: 23);
    System.out.println(simpleTextEditor);
    System.out.println("FATIH OGUZ start "+ simpleTextEditor.find( str "FATIH OGUZ") +".th index");
AdelAidA IvAnovnA,
                                      replace(a,A)
ALEXEY Fyodorovitch KArFATIH OGUZAmAzov wAs
                                                     add(FATIH OGUZ,23)
FATIH OGUZ start 23.th index
                                                     find(FATIH OGUZ)
  logger.info( msg: "===> veri yapılari start "+ simpleTextEditor4.find( str: "veri yapıları") +".th index");
hApter 1Fyodor PAvlovidata structuretch KArAmAzovALEXEY
                                                             add(data structure,23)
veri yapilari start -1.th index
                                                            find(veri yapilari)
```

```
🗐 logFile - Not Defteri
```

Dosya Düzen Biçim Görünüm Yardım Nis 02, 2020 1:41:57 ÖÖ Test main INFO: ===> FATIH OGUZ start 7.th index Nis 02, 2020 1:41:57 ÖÖ Test main INFO: ===> FATIH OGUZ start 7.th index Nis 02, 2020 1:41:57 ÖÖ Test main INFO: ===> FATIH OGUZ start 7.th index Nis 02, 2020 1:41:57 ÖÖ Test main INFO: ===> FATIH OGUZ start 7.th index Nis 02, 2020 1:41:57 ÖÖ Test main INFO: ArrayList Iterator---->>>89 ArrayList---->>>6 Linked List Iterator---->>>7

Linked List ----->>>3

logFile - Not Defteri

```
Dosya Düzen Biçim Görünüm Yardım
Nis 02, 2020 1:40:31 ÖÖ Test main
INFO: ===>
              FATIH OGUZ start 23.th index
Nis 02, 2020 1:40:31 ÖÖ Test main
INFO: ===>
              FATIH OGUZ start 23.th index
Nis 02, 2020 1:40:31 ÖÖ Test main
INFO: ===>
              FATIH OGUZ start 23.th index
Nis 02, 2020 1:40:32 ÖÖ Test main
INFO: ===>
              FATIH OGUZ start 23.th index
Nis 02, 2020 1:40:33 ÖÖ Test main
INFO: ArrayList Iterator---->>>406
ArrayList---->>>434
Linked List Iterator---->>>440
Linked List ---->>>1330
```

📗 logFile - Not Defteri

Dosya Düzen Biçim Görünüm Yardım Nis 02, 2020 1:39:05 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:39:05 ÖÖ Test main FATIH OGUZ start 23.th index INFO: ===> Nis 02, 2020 1:39:05 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:39:05 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:39:06 ÖÖ Test main INFO: ArrayList Iterator---->>>338 ArrayList---->>>87

Linked List Iterator---->>>108
Linked List ----->>>459

logFile - Not Defteri

Dosya Düzen Biçim Görünüm Yardım Nis 02, 2020 1:36:31 ÖÖ Test main FATIH OGUZ start 23.th index INFO: ===> Nis 02, 2020 1:36:31 ÖÖ Test main FATIH OGUZ start 23.th index INFO: ===> Nis 02, 2020 1:36:32 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:36:32 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:36:32 ÖÖ Test main INFO: ArrayList Iterator---->>>221 ArrayList---->>>80 Linked List Iterator---->>>54

Linked List ---->>>260

🗐 logFile - Not Defteri Dosya Düzen Biçim Görünüm Yardım Nis 02, 2020 1:21:24 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:21:25 ÖÖ Test main FATIH OGUZ start 23.th index INFO: ===> Nis 02, 2020 1:21:25 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:21:25 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:21:25 ÖÖ Test main INFO: ArrayList Iterator---->>>267

ArrayList---->>>58
Linked List Iterator---->>>39
Linked List ----->>>121

Nis 02, 2020 1:05:33 ÖÖ Test main FATIH OGUZ start 23.th index INFO: ===> Nis 02, 2020 1:05:34 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:05:34 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:05:37 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 1:05:39 ÖÖ Test main INFO: ArrayList Iterator---->>>2054 ArrayList---->>>681 Linked List Iterator---->>>870 Linked List ---->>>4352

```
logFile - Not Defteri
Dosya Düzen Biçim
```

Dosya Düzen Biçim Görünüm Yardım Nis 02, 2020 2:11:39 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 2:11:39 ÖÖ Test main FATIH OGUZ start 23.th index INFO: ===> Nis 02, 2020 2:11:39 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 2:11:39 ÖÖ Test main INFO: ===> FATIH OGUZ start 23.th index Nis 02, 2020 2:11:39 ÖÖ Test main INFO: ArrayList Iterator---->>>179 ArrayList---->>>40 Linked List Iterator---->>>26 Linked List ----->>>116

IogFile - Not Defteri

Dosya Düzen Biçim Görünüm Yardım

Nis 02, 2020 3:04:41 ÖS Test main

INFO: ===> FATIH OGUZ start 23.th index

Nis 02, 2020 3:04:41 ÖS Test main

INFO: ===> FATIH OGUZ start 23.th index

Nis 02, 2020 3:04:41 ÖS Test main

INFO: ===> FATIH OGUZ start 23.th index

Nis 02, 2020 3:04:43 ÖS Test main

INFO: ===> veri yapilari start -1.th index

Nis 02, 2020 3:04:43 ÖS Test main

INFO: ArrayList Iterator---->>>154

ArrayList---->>>40 Linked List Iterator---->>>24

Linked List ---->>>1150