Gebze Technical University

Computer Engineering

CSE222-2020-SPRING

Homework-3_part2 Report

Ferdi Sönmez

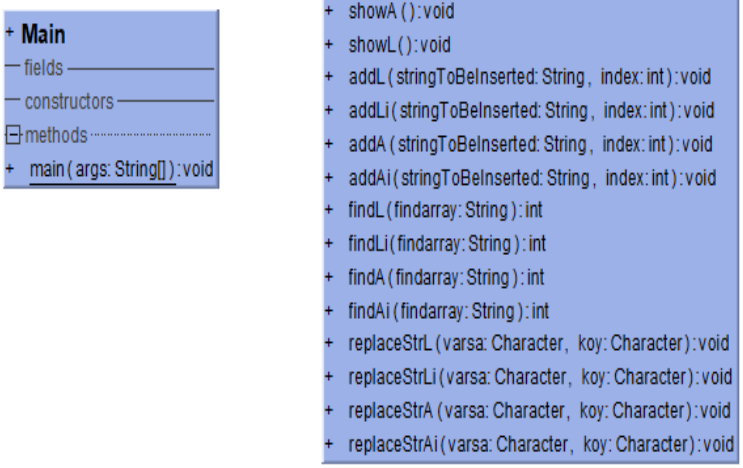
161044046

1)Problem Solutions Approach

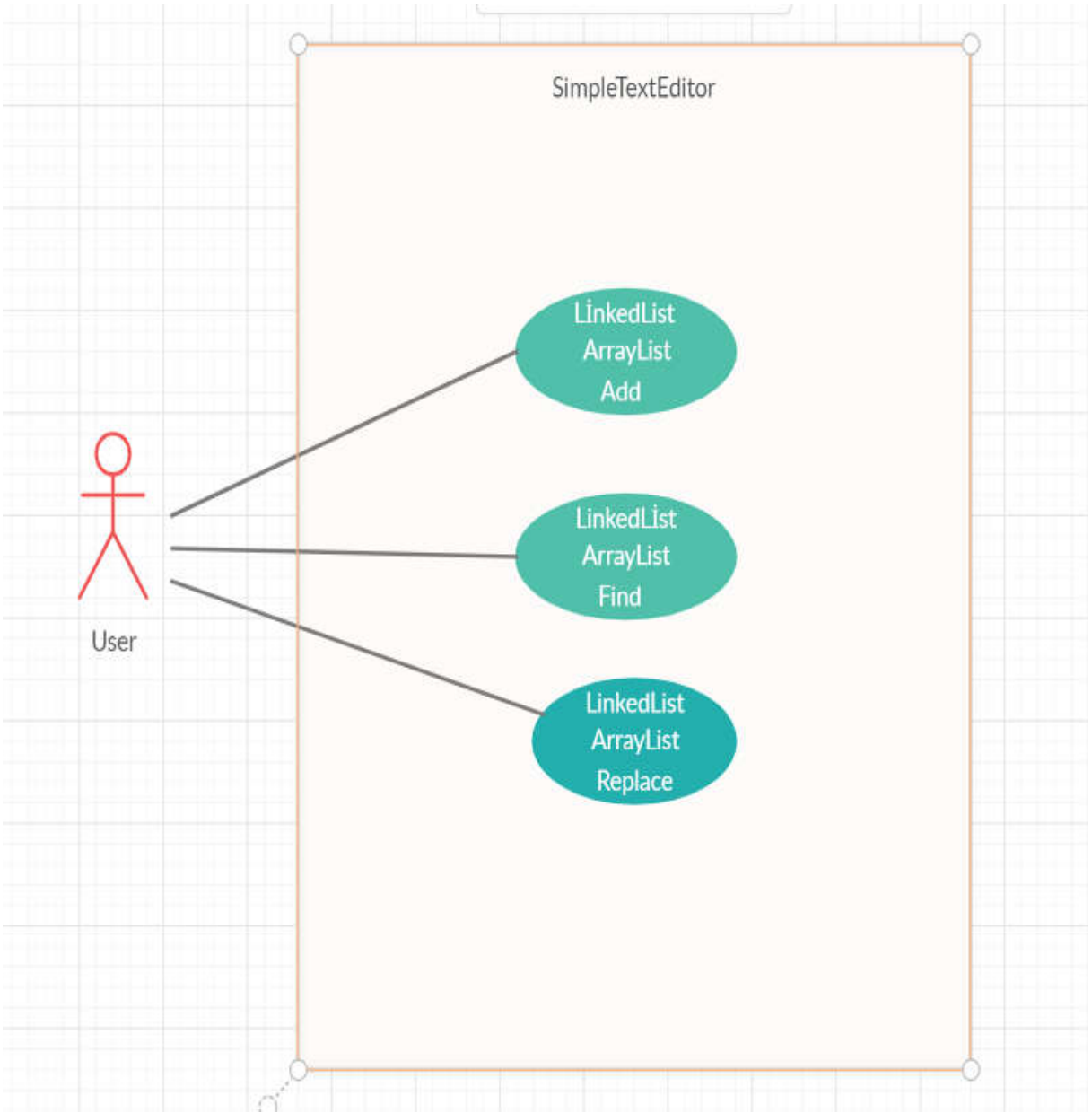
First, both Arraylist and LinkedList were kept in the SimpleTextEditor class. In this class defined that add,read,find,replace and show method,both of these functions defined with iterator or not use iterator.

The show function is extra defined as if any transactions were made within these lists.

2) Class Diagram



3)Use Case Diagram



4)Test Case

a) The file was read and filled into LinkedList and ArrayList.

```
logger.info( msg: "MyFirst log");
String satir = "";
String ekle = "For";
String ekle1 = "Hello";
yeni.DosyaRead(file, satir);
logger.info( msg: "Read File");
yeni.addL(ekle,  index: 2);
logger.info( msg: "New element added specific index to linked list");
yeni.showL();
System.out.println("******addL******");
```

```
***LinkedList****
J
a
F
o
r
v
a
?
```

b) New element(For) added to a specific location of the LinkedList.

```
logger.info( msg: "MyFirst log");
String satir = "";
String ekle = "For";
String ekle1 = "Hello";
yeni.DosyaRead(file, satir);
logger.info( msg: "Read File");
yeni.addL(ekle,  index: 2);
logger.info( msg: "New element added specific index to linked list");
yeni.showL();
System.out.println("******addL******");
```

```
***LinkedList****
J
a
F
o
r
v
a
?
```

c) New element(Hello) added to a specific location of the LinkedList with iterator.

```
yeni.addLi(ekle1, index: 6);
logger.info( msg: "New element added specific index to linked list with iterator");
yeni.showL();
System.out.println("****addLi****");
```

```
******addL******
***LinkedList****
J
a
F
o
r
v
H
e
l
l
o
a
?
```

d) New element(Yap) added to a specific location of the ArrayList.

```
yeni.addA( stringToBeInserted: "Yap", index: 1);
yeni.showA();
logger.info( msg: "New element added specific index to ArrayList");
System.out.println("***addA****");
```

```
***ArrayList****
J
Y
a
p
a
v
a
?
***addA****
```

e) New element(Olsun) added to a specific location of the ArrayList with iterator.

```
yeni.addAi( stringToBeInserted: "Olsun",  index: 0);
logger.info( msg: "New element added specific index to ArrayList with iterator");
yeni.showA();
System.out.println("****addAi****");
```

```
***ArrayList****
O
l
s
u
n
J
Y
a
p
a
v
a
?
****addAi****
```

f) All search results indexes are shown.

```
if (yeni.findL( findarray: "For") != -1) {
    System.out.println("IndexfindL=" + yeni.findL( findarray: "For"));
} else {
    System.out.println("Not Found");
}
logger.info( msg: "Searched character found in Linkedlist or not found");
System.out.println("***findL****");
if (yeni.findLi( findarray: "Hel") != -1) {
    System.out.println("IndexfindLi=" + yeni.findLi( findarray: "Hel"));
} else {
    System.out.println("Not Found");
}
logger.info( msg: "Searched character found in Linkedlist or not found with iterator");
System.out.println("***findLi****");
if (yeni.findA( findarray: "JY") != -1) {
    System.out.println("IndexfindA=" + yeni.findA( findarray: "JY"));
    ;
} else {
    System.out.println("Not Found");
}
logger.info( msg: "Searched character found in Arraylist or not found");
System.out.println("***findA****");
if (yeni.findAi( findarray: "O1") != -1) {
    System.out.println("IndexfindAi=" + yeni.findAi( findarray: "O1"));
} else {
    System.out.println("Not Found");
}
logger.info( msg: "Searched character found in Arraylist or not found with iterator");
```

```
IndexfindL=2
***findL****
IndexfindLi=6
***findLi****
IndexfindA=5
***findA****
IndexfindAi=0
**findAi***
**************************
```

g) The character you want changes in Linked List.

```
System.out.println("*************************");
yeni.replaceStrL( varsa: 'a',  koy: 'x');
logger.info( msg: "Desired character replaced with other character in Linkedlist");
yeni.showL();
System.out.println("*************************");
```

```
***LinkedList****
J
x
F
o
r
v
H
e
l
l
o
x
?
*****************************
```

h) The character you want changes in Linked List with iterator.

```
System.out.println("*************************");
yeni.replaceStrLi( varsa: 'J',  koy: '#');
logger.info( msg: "Desired character replaced with other character in Linkedlist with iterator");
yeni.showL();
System.out.println("*************************");
```

```
***LinkedList****
#
x
F
o
r
v
H
e
l
l
o
x
?
*****************************
```

I) The character you want changes in ArrayList.

```
System.out.println("***************************");
yeni.replaceStrA( varsa: 'n', koy: '%');
logger.info( msg: "Desired character replaced with other character in Arraylist");
yeni.showA();
System.out.println("***************************");
```

```
***ArrayList****
O
l
s
u
%
J
Y
a
p
a
v
a
?
```

j) The character you want changes in ArrayList with iterator.

```
yeni.replaceStrAi( varsa: 'a', koy: '&');
logger.info( msg: "Desired character replaced with other character in Arraylist with iterator");
yeni.showA();
System.out.println("***************************");
```

```
***ArrayList****
O
l
s
u
%
J
Y
&
p
&
v
&
?
*****************************
```

ArrayList vs LinkedList

1-)Insertions are easy and fast in LinkedList as compared to ArrayList because there is no risk of resizing array and copying content to new array if array gets full which makes adding into ArrayList of O(n) in worst case, while adding is O(1) operation in LinkedList in Java. ArrayList also needs to be update its index if you insert something anywhere except at the end of array.

2-)Removal also better in LinkedList than ArrayList due to same reasons as insertion.

3-)LinkedList has more memory overhead than ArrayList because in ArrayList each index only holds actual object (data) but in case of LinkedList each node holds both data and address of next and previous node.

4-)Both LinkedList and ArrayList require O(n) time to find if an element is present or not. However we can do Binary Search on ArrayList if it is sorted and therefore can search in O(Log n) time.