

GIT DEPARTMENT OF COMPUTER ENGINEERING

CSE 222/505 - SPRING 2020

HOMEWORK 3 REPORT

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PROBLEM SOLUTION APPROACH

Q1:

The LinkedList class should be generic. It has to keep data in the array in nodes. The class be as double linked list, so it needs a head(node), a tail(node) and it also the size of the elements in the list.

Firstly, I should create the inner Node class for the LinkedList class. We need a previous node, a next node, a capacity, a used size and a data array as fields. I used the data array for I keep elements and I used also the previous node and next node because I have to keep the information of relation between nodes. In the Node class, the capacity and used size fields are related to size of the data array. I need to use used variable because the data array is partial field array and its capacity is constant. I used a final int value in the LinkedList class to keep the capacity constant.

After implements ListIterator for the Iterator class, I override the required methods. But we has an array as data in the list and this situation is confusing. I need to know which node the iterator is in when running methods, so I need a node in the Iterator class. if we equal this node to head, the iterator can navigate through the nodes. When necessary, I check if the index is at the end of the node and according to the result, I move on to the other node. I have to be careful with the hasNext and hasPrevious methods. I have to check if the iterator is in the tail in hasNext() method. Likewise, I have to check if the iterator is in the head in hasPrevious() method. Finally, I used the indexOfList variable for methods like nextIndex(). This variable is necessary because these methods have to return the index that the user knows .

In the LinkedList class, in cases where the node is full when adding, a new node is inserted. When removing, it is necessary to delete if this node is empty anymore.

Q2:

My method's running time:

n = text size, m = string size

	ARRAYLIST		LINKEDLIST	
	Loop	Iterator	Loop	Iterator
READ	$O(n)$	$O(n)$	$O(n^2)$	$O(n^2)$
ADD	$O(n+m)$	$O(n+m)$	$O(n^2+m^2)$	$O(n^2+m^2)$
FIND	$O(n)$	$O(n)$	$O(n^2)$	$O(n)$
REPLACE	$O(n)$	$O(n)$	$O(n^2)$	$O(n)$

For ArrayList, methods written using the loop and written using the iterator run at similar times. Since ArrayList uses the array, there is no difference in runtime between using loop and using iterator.

Linked List methods take longer time than ArrayList methods, because the running time of the most of methods of the Linked List is linear time. It takes less time to create LinkedList methods using a repeater. because when I use the repeater, I don't have to go from the beginning of the list to the end.

First Text:

These methods running time:

(ArrayList)	Loop	Iterator
Read	2 927 600.0 ns	2 927 800.0 ns
Add	2 927 000.0 ns	976 300.0 ns
Find	975 800.0 ns	0.0 ns
Replace	973 800.0 ns	975 800.0 ns

(LinkedList)	Loop	Iterator
Read	1 951 100.0 ns	1 952 100.0 ns
Add	7 807 400.0 ns	1 951 100.0 ns
Find	0.0 ns	0.0 ns
Replace	976 100.0 ns	0.0 ns

Second Text:

These methods running time:

(ArrayList)	Loop	Iterator
Read	4 879 700.0 ns	2 927 400.0 ns
Add	975 900.0 ns	1 952 100.0 ns
Find	0.0 ns	0.0 ns
Replace	0.0 ns	975 600.0 ns

(LinkedList)	Loop	Iterator
Read	1 951 200.0 ns	1 951 500.0 ns
Add	2.04975E7 ns	976 300.0 ns
Find	974 600.0 ns	0.0 ns
Replace	0.0 ns	0.0 ns

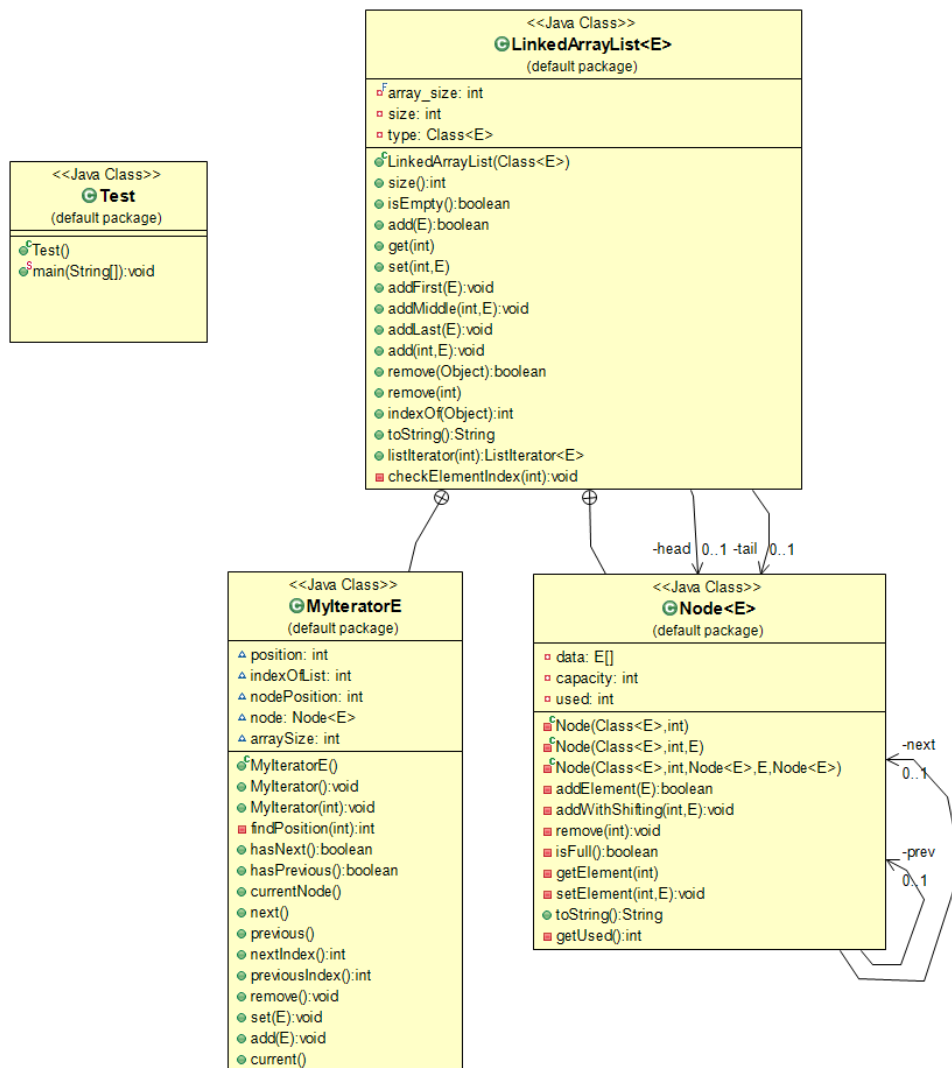
I assumed that read methods of the LinkedList would take longer. When I run the code, the read methods of the ArrayList took longer. However, since these running times units are nanoseconds, they are actually quite close. ArrayList can be preferred to read from the file.

I assumed that the ArrayList would be faster in the add method. It was as I thought. Especially the methods of LinkedList using loop are slower than others.

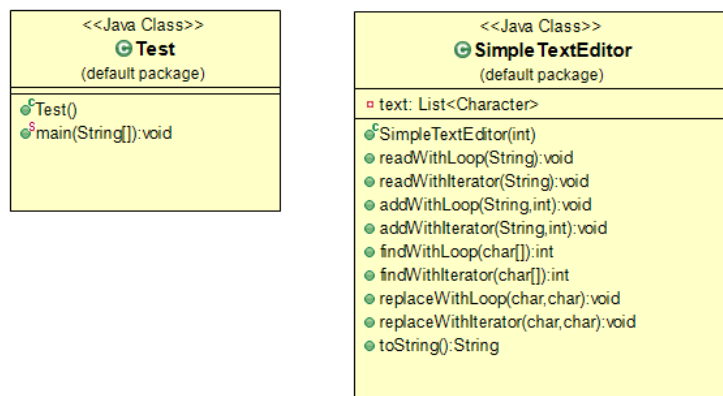
Find and replace methods work at similar times, except for the LinkedList method, which uses the loop. This method is slower than the others. Using iterator with LinkedList makes things very easy. In the code I wrote, the working times of these two methods appeared similar. This may be because we went from beginning to end of the text.

CLASS DIAGRAM

Q1:



Q2:



TEST CASES

Q1:

Test Case 1: This list is empty or not empty.

```
LinkedList<Character> myList = new LinkedList<>(Character.class);

if(myList.isEmpty())
    System.out.println("This list is empty.");
else
    System.out.println("This list is not empty.");
System.out.println("The character 'S' is adding to the end of the list.");
myList.add('S');
System.out.println("The character 'E' is adding to the end of the list.");
myList.add('E');

if(myList.isEmpty())
    System.out.println("This list is empty.");
else
    System.out.println("This list is not empty.");
```

Test Case 2: add an element to the beginning of the list

```
System.out.println("The character 'A' is adding to the 0. index of the list.");
myList.add(index: 0, element: 'A');
```

Test Case 3: add an element with the index

```
System.out.println("The character 'K' is adding to the 1. index of the list.");
myList.add(index: 1, element: 'K');
System.out.print(myList);
```

Test Case 4: add an element to the end of the list

```
System.out.println("The character 'L' is adding to the end of the list.");
myList.add('L');
```

Test Case 5: add an element with the invalid index

```
try {
    myList.add(index: 20, element: 'J');
    System.out.println("The character 'J' is adding to the 20. index of the list.");
    System.out.print(myList);
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
    System.out.println("The character 'J' is not added.");
}

try {
    myList.add(index: -1, element: 'Z');
    System.out.println("The character 'Z' is adding to the -1. index of the list.");
    System.out.print(myList);
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
    System.out.println("The character 'Z' is not added.");
}
```

Test Case 6: When you add an element to the node you are on, fill it and create a new node

```
System.out.println("-----");
System.out.println("The character 'M' is adding to the 3. index of the list.");
myList.add( index: 3, element: 'M');
System.out.print(myList);
System.out.println("-----");
```

Test Case 7: remove an element that is the last element in the list and find the index of an element. The second node is empty anymore.

```
System.out.print("The last character is: ");
char c = myList.get(5);
System.out.println(c);
System.out.println("The character '" + c + "' is removing from the list.");
myList.remove((Object) c);
System.out.println("This character is removed.");
System.out.print(myList);
System.out.println("-----");
```

Test Case 8: remove an element from the beginnig of the list

```
System.out.println("-----");
System.out.println("The character 'A' is removing from the list.");
myList.remove( index: 0);
System.out.print(myList);
System.out.println("-----");
```

Test Case 9: remove an element with invalid index

```
try{
    myList.remove( index: -1);
    System.out.print(myList);
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
    System.out.println("not removed.");
}
try{
    myList.remove( index: 20);
    System.out.print(myList);
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
    System.out.println("not removed.");
}
```

Test Case 10: set and get methods

```
try{
    int index = myList.get(2);
    System.out.println("Element in index 2: " + index);
    System.out.println("Set index 2 with character 'V'");
    myList.set(2, 'V');
    System.out.println(myList);
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
}
```

Invalid indexes:

```
try{
    myList.set(10, 'V');
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
}

try{
    c = myList.get(7);
    System.out.println("Element in index 7: " + c);
} catch (IndexOutOfBoundsException e){
    System.out.println(e);
}
```

Test Case 11: remove an element not in the list

```
System.out.println("The character 'L' is removing from the list.");
if(myList.remove((Object) 'L'))
    System.out.println("This element 'L' is removed");
else
    System.out.println("This element 'L' is not removed");
System.out.println("-----");
```

Test Case 12: using indexOf method with an element not in the list

```
int index = myList.indexOf('A');
if(index == -1)
    System.out.println("This element 'A' is not found in the list");
else
    System.out.println("Index of 'A': " + index);
```

With an element is in the List

```
int index = myList.indexOf('S');
if(index == -1)
    System.out.println("This element 'S' is not found in the list");
else
    System.out.println("Index of 'S': " + index);
```

Test Case 13: using myIterator methods

```
ListIterator<Character> iterator = myList.listIterator();  
while(iterator.hasNext())  
    System.out.println(iterator.next());
```

```
ListIterator<Character> iterator2 = myList.listIterator( index: 2);  
while(iterator2.hasNext())  
    System.out.println(iterator2.next());
```

Q2:

First Text:

ArrayList Methods:

```
textArrayList.readWithLoop(filename);
```

```
textArrayList.addWithLoop( str: "WONDERFUL ", index: 1704);
```

```
int index = textArrayList.findWithLoop(arr2);
```

```
textArrayList.replaceWithLoop( removed: 'a', added: 'A');
```

```
textArrayList.readWithIterator(filename);
```

```
textArrayList.addWithIterator( str: "WONDERFUL ", index: 1704);
```

```
index = textArrayList.findWithIterator(arr2);
```

```
textArrayList.replaceWithIterator( removed: 'a', added: 'A');
```

LinkedList Methods:

```
textLinkedList.readWithLoop(filename);
```

```
textLinkedList.addWithLoop( str: "WONDERFUL ", index: 1704);
```

```
index = textLinkedList.findWithLoop(arr2);
```

```
textLinkedList.replaceWithLoop( removed: 'a', added: 'A');
```

```
textLinkedList.readWithIterator(filename);
```

```
textLinkedList.addWithIterator( str: "WONDERFUL ", index: 1704);
```

```
index = textLinkedList.findWithIterator(arr2);
```

```
textLinkedList.replaceWithIterator( removed: 'a', added: 'A');
```


Second Text:

ArrayList Methods:

```
textArrayList.readWithLoop(filename);
```

```
textArrayList.addWithLoop( str: "WONDERFUL ", index: 3600);
```

```
int index = textArrayList.findWithLoop(arr2);
```

```
textArrayList.replaceWithLoop( removed: 'a', added: 'A');
```

```
textArrayList.readWithIterator(filename);
```

```
textArrayList.addWithIterator( str: "WONDERFUL ", index: 3600);
```

```
index = textArrayList.findWithIterator(arr2);
```

```
textArrayList.replaceWithIterator( removed: 'a', added: 'A');
```

LinkedList Methods:

```
textLinkedList.readWithLoop(filename);
```

```
textLinkedList.addWithLoop( str: "WONDERFUL ", index: 3600);
```

```
index = textLinkedList.findWithLoop(arr2);
```

```
textLinkedList.replaceWithLoop( removed: 'a', added: 'A');
```

```
textLinkedList.readWithIterator(filename);
```

```
textLinkedList.addWithIterator( str: "WONDERFUL ", index: 3600);
```

```
index = textLinkedList.findWithIterator(arr2);
```

```
textLinkedList.replaceWithIterator( removed: 'a', added: 'A');
```

First Text:

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so VERY remarkable in that; nor did Alice think it so VERY much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.

Second Text:

It was the White Rabbit, trotting slowly back again, and looking anxiously about as it went, as if it had lost something; and she heard it muttering to itself 'The Duchess! The Duchess! Oh my dear paws! Oh my fur and whiskers! She'll get me executed, as sure as ferrets are ferrets! Where CAN I have dropped them, I wonder?' Alice guessed in a moment that it was looking for the fan and the pair of white kid gloves, and she very good-naturedly began hunting about for them, but they were nowhere to be seen—everything seemed to have changed since her swim in the pool, and the great hall, with the glass table and the little door, had vanished completely.

Very soon the Rabbit noticed Alice, as she went hunting about, and called out to her in an angry tone, 'Why, Mary Ann, what ARE you doing out here? Run home this moment, and fetch me a pair of gloves and a fan! Quick, now!' And Alice was so much frightened that she ran off at once in the direction it pointed to, without trying to explain the mistake it had made.

'He took me for his housemaid,' she said to herself as she ran. 'How surprised he'll be when he finds out who I am! But I'd better take him his fan and gloves—that is, if I can find them.' As she said this, she came upon a neat little house, on the door of which was a bright brass plate with the name 'W. RABBIT' engraved upon it. She went in without knocking, and hurried upstairs, in great fear lest she should meet the real Mary Ann, and be turned out of the house before she had found the fan and gloves.

'How queer it seems,' Alice said to herself, 'to be going messages for a rabbit! I suppose Dinah'll be sending me on messages next!' And she began fancying the sort of thing that would happen: "'Miss Alice! Come here directly, and get ready for your walk!" "Coming in a minute, nurse! But I've got to see that the mouse doesn't get out." Only I don't think,' Alice went on, 'that they'd let Dinah stop in the house if it began ordering people about like that!' By this time she had found her way into a tidy little room with a table in the window, and on it (as she had hoped) a fan and two or three pairs of tiny white kid gloves: she took up the fan and a pair of the gloves, and was just going to leave the room, when her eye fell upon a little bottle that stood near the looking-glass. There was no label this time with the words 'DRINK ME,' but nevertheless she uncorked it and put it to her lips. 'I know SOMETHING interesting is sure to happen,' she said to herself, 'whenever I eat or drink anything; so I'll just see what this bottle does. I do hope it'll make me grow large again, for really I'm quite tired of being such a tiny little thing!'

It did so indeed, and much sooner than she had expected: before she had drunk half the bottle, she found her head pressing against the ceiling, and had to stoop to save her neck from being broken. She hastily put down the bottle, saying to herself 'That's quite enough—I hope I shan't grow any more—As it is, I can't get out at the door—I do wish I hadn't drunk quite so much!'

Alas! it was too late to wish that! She went on growing, and growing, and very soon had to kneel down on the floor: in another minute there was not even room for this, and she tried the effect of lying down with one elbow against the door, and the other arm curled round her head. Still she went on growing, and, as a last resource, she put one arm out of the window, and one foot up the chimney, and said to herself 'Now I can do no more, whatever happens. What WILL become of me?'

Luckily for Alice, the little magic bottle had now had its full effect, and she grew no larger: still it was very uncomfortable, and, as there seemed to be no sort of chance of her ever getting out of the room again, no wonder she felt unhappy.

'It was much pleasanter at home,' thought poor Alice, 'when one wasn't always growing larger and smaller, and being ordered about by mice and rabbits. I almost wish I hadn't gone down that rabbit-hole—and yet—and yet—it's rather curious, you know, this sort of life! I do wonder what CAN have happened to me! When I used to read fairy-tales, I fancied that kind of thing never happened, and now here I am in the middle of one! There ought to be a book written about me, that there ought! And when I grow up, I'll write one—but I'm grown up now,' she added in a sorrowful tone; 'at least there's no room to grow up any more HERE.'

'But then,' thought Alice, 'shall I NEVER get any older than I am now? That'll be a comfort, one way—never to be an old woman—but then—always to have lessons to learn! Oh, I shouldn't like THAT!'

'Oh, you foolish Alice!' she answered herself. 'How can you learn lessons in here? Why, there's hardly room for YOU, and no room at all for any lesson-books!'

And so she went on, taking first one side and then the other, and making quite a conversation of it altogether; but after a few minutes she heard a voice outside, and stopped to listen.

RUNNING AND RESULTS

Q1:

Test Case 1: (This list is empty or not empty)

```
-----  
This list is empty.  
-----  
The character 'S' is adding to the end of the list.  
The character 'E' is adding to the end of the list.  
-----  
This list is not empty.  
-----  
My List :  
S - E  
-----
```

Test Case 2: (add an element to the beginning of the list)

```
-----  
The character 'A' is adding to the 0. index of the list.  
My List :  
A - S - E  
-----
```

Test Case 3: (add an element with the index)

```
-----  
The character 'K' is adding to the 1. index of the list.  
My List :  
A - K - S - E  
-----
```

Test Case 4: (add an element to the end of the list)

```
-----  
The character 'L' is adding to the end of the list.  
My List :  
A - K - S - E - L  
-----
```

Test Case 5: (add an element with the invalid index)

```
java.lang.IndexOutOfBoundsException: 20  
The character 'J' is not added.  
java.lang.IndexOutOfBoundsException: -1  
The character 'Z' is not added.
```

Test Case 6: (When you add an element to the node you are on, fill it and create a new node)

```
-----  
The character 'M' is adding to the 3. index of the list.  
My List :  
A - K - S - M - E - L  
-----
```

Test Case 7: (remove an element that is the last element in its node and find the index of an element that is in list)

```
-----  
The last character is: L  
The character 'L' is removing from the list.  
This character is removed.  
My List :  
A - K - S - M - E  
-----
```

Test Case 8: (remove an element from the beginnig of the list)

```
-----  
The character 'A' is removing from the list.  
My List :  
K - S - M - E  
-----
```

Test Case 9: (remove the element with invalid index)

```
-----  
java.lang.IndexOutOfBoundsException: -1  
not removed.  
java.lang.IndexOutOfBoundsException: 20  
not removed.  
-----
```

Test Case 10: (set and get methods)

```
My List :  
A - K - S - M - E
```

```
Element in index 2: M  
Set index 2 with character 'V'  
My List :  
K - S - V - E
```

(Invalid indexes)

```
-----  
java.lang.IndexOutOfBoundsException: 7  
-----
```

```
-----  
java.lang.IndexOutOfBoundsException: 10  
-----
```

Test Case 11: (remove an element not in the list)

```
-----  
The character 'L' is removing from the list.  
This element 'L' is not removed  
-----
```

Test Case 12: (using indexOf method with an element not in the list)

```
This element 'A' is not found in the list
```

```
Index of 'S': 1
```

Test Case 13: (using mylterator methods)

First iterator :

```
K
S
V
E
```

Second iterator :

```
E
```

Q2:

First Text:

ArrayList: (Loop)

```
INFO: Running time for the read method with loop(ArrayList): 2927600.0 nanoseconds
```

```
INFO: Running time for the add method with loop(ArrayList): 2927000.0 nanoseconds
```

```
INFO:
Alice was beginning to get very tired of sitting by her sister on the bank, and of having
nothing to do: once or twice she had peeped into the book her sister was reading, but it had
no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without
pictures or conversation?'
So she was considering in her own mind (as well as she could, for the hot day made her
feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth
the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink
eyes ran close by her.
There was nothing so VERY remarkable in that; nor did Alice think it so VERY much
out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she
thought it over afterwards, it occurred to her that she ought to have wondered at this, but at
the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT
OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her
feet, for it flashed across her mind that she had never before seen a rabbit with either a
waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the
field after it, and fortunately was just in time to see it pop down a large rabbit-hole under
the hedge.
In another moment down went Alice after it, never once considering how in the world
she was to get out again.
The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly
down, so suddenly that Alice had not a moment to think about stopping herself before she
found herself falling down a very deep well.
WONDERFUL Either the well was very deep, or she fell very slowly, for she had plenty of time as she
went down to look about her and to wonder what was going to happen next. First, she tried
to look down and make out what she was coming to, but it was too dark to see anything;
then she looked at the sides of the well, and noticed that they were filled with cupboards
and book-shelves; here and there she saw maps and pictures hung upon pegs. She took
down a jar from one of the shelves as she passed; it was labelled 'ORANGE
MARMALADE', but to her great disappointment it was empty: she did not like to drop the
jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell
past it.
```

```
INFO: Running time for the find method with loop(ArrayList): 975800.0 nanoseconds
```

```
INFO: This string found on 2242. index.
```

```
INFO: Running time for the replace method with loop(ArrayList): 973800.0 nanoseconds
```

INFO:

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'And what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so very remarkable in that; nor did Alice think it so very much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

WONDERFUL Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.

ArrayList (Iterator):

INFO: Running time for the read method with iterator(ArrayList): 2927800.0 nanoseconds

INFO: Running time for the add method with iterator(ArrayList): 976300.0 nanoseconds

INFO:

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so very remarkable in that; nor did Alice think it so very much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

WONDERFUL Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.


```
INFO: Running time for the find method with iterator(ArrayList): 0.0 nanoseconds
```

```
INFO: This string found on 2242. index.
```

```
INFO: Running time for the replace method with iterator(ArrayList): 975800.0 nanoseconds
```

INFO:

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so very remarkable in that; nor did Alice think it so very much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

WONDERFUL Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.

LinkedList (Loop):

```
INFO: Running time for the read method with loop(LinkedList): 1951100.0 nanoseconds
```

```
INFO: Running time for the add method with loop(LinkedList): 7807400.0 nanoseconds
```

INFO:

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so very remarkable in that; nor did Alice think it so very much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

WONDERFUL Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.


```
INFO: Running time for the find method with loop(LinkedList): 0.0 nanoseconds
```

```
INFO: This string found on 2242. index.
```

```
INFO: Running time for the replace method with loop(LinkedList): 976100.0 nanoseconds
```

INFO:

Alice wAs beginning to get very tired of sitting by her sister on the bAnk, And of hAVing nothing to do: once or twice she hAd peeped into the book her sister wAs reAding, but it hAd no pictures or conversAtions in it, 'And whAt is the use of A book,' thought Alice 'without pictures or conversAtion?'

So she wAs considering in her own mind (As well As she could, for the hot dAY mAdE her feel very sleepy And stupid), whether the pleAsure of mAKing A dAisy-chAin would be worth the trouble of getting up And picking the dAisies, when suddenly A White RABbit with pink eyes rAn close by her.

There wAs nothing so VERY remArkABle in thAt; nor did Alice think it so VERY much out of the wAY to heAr the RABbit sAY to itself, 'Oh deAr! Oh deAr! I shAll be lAtel!' (when she thought it over AfterwArds, it occurred to her thAt she ought to hAve wondered At this, but At the time it All seemed quite nAturAl); but when the RABbit ActuAlly TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, And looked At it, And then hurried on, Alice stArted to her feet, for it flAshed Across her mind thAt she hAd never before seen A rABbit with either A wAistCoAt-pocket, or A wAtch to tAke out of it, And burning with curiosity, she rAn Across the field After it, And fortunAtely wAS just in time to see it pop down A lARge rABbit-hole under the hedge.

In Another moment down went Alice After it, never once considering how in the world she wAs to get out AgAin.

The rABbit-hole went strAight on like A tunnel for some wAY, And then dipped suddenly down, so suddenly thAt Alice hAd not A moment to think About stopping herself before she found herself fAlling down A very deep well.

WONDERFUL Either the well wAs very deep, or she fell very slowly, for she hAd plenty of time As she went down to look About her And to wonder whAt wAS going to hAPpen next. First, she tried to look down And mAKe out whAt she wAs coming to, but it wAS too dArk to see Anything; then she looked At the sides of the well, And noticed thAt they were filled with cupboArds And book-shelves; here And there she sAw mAPs And pictures hung upon pegs. She took down A jAr from one of the shelves As she pAssed; it wAS lABelled 'ORANGE MARMALADE', but to her greAt disAppointment it wAS empty: she did not like to drop the jAr for feAr of killing somebody, so mAnAged to put it into one of the cupboArds As she fell pAst it.

LinkedList (iterator):

```
INFO: Running time for the read method with iterator(LinkedList): 1952100.0 nanoseconds
```

```
INFO: Running time for the add method with iterator(LinkedList): 1951100.0 nanoseconds
```

INFO:

Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so VERY remarkable in that; nor did Alice think it so VERY much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural); but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.

The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

WONDERFUL Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs. She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.

```
INFO: Running time for the find method with iterator(LinkedList): 0.0 nanoseconds
```

```
INFO: This string found on 2242. index.
```

```
INFO: Running time for the replace method with iterator(LinkedList): 0.0 nanoseconds
```

```
INFO:
Alice wAs beginning to get very tired of sitting by her sister on the bAnk, And of hAVing
nothing to do: once or twice she hAd peeped into the book her sister wAs reAding, but it hAd
no pictures or conversAtions in it, 'And whAt is the use of A book,' thought Alice 'without
pictures or conversAtion?'
So she wAs considering in her own mind (As well As she could, for the hot dAY mAdE her
feel very sleepy And stupid), whether the pleAsure of mAKing A dAisy-chAin would be worth
the trouble of getting up And picking the dAisies, when suddenly A White RABbit with pink
eyes rAn close by her.
There wAs nothing so VERY remArkAble in thAt; nor did Alice think it so VERY much
out of the wAY to heAr the RABbit sAY to itself, 'Oh deAr! Oh deAr! I shAll be lAtel!' (when she
thought it over AfterwArds, it occurred to her thAt she ought to hAVe wondered At this, but At
the time it All seemed quite nAturAl); but when the RABbit ActuAlly TOOK A WATCH OUT
OF ITS WAISTCOAT-POCKET, And looked At it, And then hurried on, Alice stArted to her
feet, for it fLASHed Across her mind thAt she hAd never before seen A rABbit with either A
wAistCoAt-pocket, or A wAtch to tAKE out of it, And burning with curiosity, she rAn Across the
field After it, And fortunAtely wAs just in time to see it pop down A lARge rABbit-hole under
the hedge.
In Another moment down went Alice After it, never once considering how in the world
she wAs to get out AgAin.
The rABbit-hole went strAight on like A tunnel for some wAY, And then dipped suddenly
down, so suddenly thAt Alice hAd not A moment to think About stopping herself before she
found herself fALLing down A very deep well.
WONDERFUL Either the well wAs very deep, or she fell very slowly, for she hAd plenty of time As she
went down to look About her And to wonder whAt wAs going to hAppen next. First, she tried
to look down And mAke out whAt she wAs coming to, but it wAs too dAnk to see Anything;
then she looked At the sides of the well, And noticed thAt they were filled with cupboArds
And book-shelves; here And there she sAw mAPs And pictures hung upon pegs. She took
down A jAR from one of the shelves As she pAssed; it wAs lAbelled 'ORANGE
MARMALADE', but to her greAt disAppointment it wAs empty: she did not like to drop the
jAR for feAr of killing somebody, so mAnAged to put it into one of the cupboArds As she fell
pAst it.
```

Second Text:

Arraylist (Loop):

```
INFO: Running time for the read method with loop(ArrayList): 4879700.0 nanoseconds
```

```
INFO: Running time for the add method with loop(ArrayList): 975900.0 nanoseconds
```

...

```
Alas! it was too late to wish that! She went on growing, and growing, and very soon had
to kneel down on the floor: in another minute there was not even room for this, and she tried
the effect of lying down with one elbow against the door, and the other arm curled round
her head. Still she went on growing, and, as a last resource, she put one arm out of the
window, and one foot up the chimney, and said to herself 'Now I can do no more, whatever
happens. What WILL become of me?'
Luckily WONDERFUL for Alice, the little magic bottle had now had its full effect, and she grew no
larger: still it was very uncomfortable, and, as there seemed to be no sort of chance of her
ever getting out of the room again, no wonder she felt unhappy.
'It was much pleasanter at home,' thought poor Alice, 'when one wasn't always growing
larger and smaller, and being ordered about by mice and rabbits. I almost wish I hadn't gone
down that rabbit-hole--and yet--and yet--it's rather curious, you know, this sort of life! I
do wonder what CAN have happened to me! When I used to read fairy-tales, I fancied that
kind of thing never happened, and now here I am in the middle of one! There ought to be a
book written about me, that there ought! And when I grow up, I'll write one--but I'm grown
up now,' she added in a sorrowful tone; 'at least there's no room to grow up any more
HERE.'
```

...

```
INFO: Running time for the find method with loop(ArrayList): 0.0 nanoseconds
```

```
INFO: This string found on 292. index.
```

```
INFO: Running time for the replace method with loop(ArrayList): 0.0 nanoseconds
```

INFO: It wAs the White RABbit, trotting slowly bAck AgAin, And looking Anxiously About As it went, As if it hAd lost something; And she heArD it muttering to itself 'The Duchess! The Duchess! Oh my deAr pAwS! Oh my fur And whiskers! She'll get me executed, As sure As ferrets Are ferrets! Where CAN I hAve dropped them, I wonder?' Alice guessed in A moment thAt it wAs looking for the fAn And the pAir of white kid gloves, And she very good-nAturedly begAn hunting About for them, but they were nowhere to be seen--everything seemed to hAve chAngeD since her swim in the pool, And the greAt hAll, with the gLAss tABle And the little door, hAd vAnished completely.

Very soon the RABbit noticed Alice, As she went hunting About, And cAlled out to her in An Angry tone, 'Why, MArY Ann, whAt ARE you doing out here? Run home this moment, And fetch me A pAir of gloves And A fAn! Quick, now!' And Alice wAs so much frightened thAt she rAn off At once in the direction it pointed to, without trying to explAin the mistAke it hAd mAde.

'He took me for his housemAid,' she sAid to herself As she rAn. 'How surprised he'll be when he finds out who I Am! But I'd better tAke him his fAn And gloves--thAt is, if I cAn find them.' As she sAid this, she cAme upon A neAt little house, on the door of which wAs A bright brAss pLAtE with the nAme 'W. RABBIT' engrAved upon it. She went in without knocking, And hurried upstAirs, in greAt feAr lest she should meet the reAl MArY Ann, And be turned out of the house before she hAd found the fAn And gloves.

'How queer it seems,' Alice sAid to herself, 'to be going messAgEs for A rABbit! I suppose DinAh'll be sending me on messAgEs next!' And she begAn fAnCyIng the sort of thing thAt would hAppen: "'Miss Alice! Come here directly, And get reADy for your wAlk!" "Coming in A minute, nurse! But I've got to see thAt the mouse doesn't get out." Only I don't think,' Alice went on, 'thAt they'd let DinAh stop in the house if it begAn ordering people About like thAt!' By this time she hAd found her wAY into A tidy little room with A tABle in the window, And on it (As she hAd hoped) A fAn And two or three pAirs of tiny white kid gloves: she took up the fAn And A pAir of the gloves, And wAs just going to leAve the room, when her eye fell upon A little bottle thAt stood neAr the looking-gLAss. There wAs no lABel this time with the words 'DRINK ME,' but nevertheless she uncorked it And put it to her lips. 'I know . . .

Arraylist (Iterator):

```
INFO: Running time for the read method with iterator(ArrayList): 2927400.0 nanoseconds
```

```
INFO: Running time for the add method with iterator(ArrayList): 1952100.0 nanoseconds
```

...

Alas! it was too late to wish that! She went on growing, and growing, and very soon had to kneel down on the floor: in another minute there was not even room for this, and she tried the effect of lying down with one elbow against the door, and the other arm curled round her head. Still she went on growing, and, as a last resource, she put one arm out of the window, and one foot up the chimney, and said to herself 'Now I can do no more, whatever happens. What WILL become of me?'

Luckily WONDERFUL for Alice, the little magic bottle had now had its full effect, and she grew no larger: still it was very uncomfortable, and, as there seemed to be no sort of chance of her ever getting out of the room again, no wonder she felt unhappy.

'It was much pleasanter at home,' thought poor Alice, 'when one wasn't always growing larger and smaller, and being ordered about by mice and rabbits. I almost wish I hadn't gone down that rabbit-hole--and yet--and yet--it's rather curious, you know, this sort of life! I do wonder what CAN have happened to me! When I used to read fairy-tales, I fancied that kind of thing never happened, and now here I am in the middle of one! There ought to be a book written about me, that there ought! And when I grow up, I'll write one--but I'm grown up now,' she added in a sorrowful tone; 'at least there's no room to grow up any more HERE.'

...

```
INFO: Running time for the find method with iterator(ArrayList): 0.0 nanoseconds
```

```
INFO: This string found on 292. index.
```

```
INFO: Running time for the replace method with iterator(ArrayList): 975600.0 nanoseconds
```

```
INFO: It wAs the White RABbit, trotting slowly bAck AgAin, And looking Anxiously About As it
went, As if it hAd lost something; And she heArD it muttering to itself 'The Duchess! The
Duchess! Oh my deAr pAWs! Oh my fur And whiskers! She'll get me executed, As sure As
ferrets Are ferrets! Where CAN I hAve dropped them, I wonder?' Alice guessed in A moment
thAt it wAs looking for the fAn And the pAir of white kid gloves, And she very good-nAturedly
begAn hunting About for them, but they were nowhere to be seen—everything seemed to
hAve chAnged since her swim in the pool, And the greAt hAll, with the glAss tAbLe And the
little door, hAd vAnished completely.
Very soon the RABbit noticed Alice, As she went hunting About, And cAlled out to her in An
Angry tone, 'Why, MArY Ann, whAt ARE you doing out here? Run home this moment, And
fetch me A pAir of gloves And A fAn! Quick, now!' And Alice wAs so much frightened thAt
she rAn off At once in the direction it pointed to, without trying to explAin the mistAke it hAd
mAde.
'He took me for his housemAid,' she sAid to herself As she rAn. 'How surprised he'll be
when he finds out who I Am! But I'd better tAke him his fAn And gloves—thAt is, if I cAn find
them.' As she sAid this, she cAme upon A neAt little house, on the door of which wAs A bright
brAss plAtE with the nAme 'W. RABBIT' engrAved upon it. She went in without knocking,
And hurried upstAirs, in greAt feAr lest she should meet the reAl MArY Ann, And be turned out
of the house before she hAd found the fAn And gloves.
'How queer it seems,' Alice sAid to herself, 'to be going messAgEs for A rABbit! I suppose
DinAh'll be sending me on messAgEs next!' And she begAn fAnCyng the sort of thing thAt
would hAppen: "'Miss Alice! Come here directly, And get reAdy for your wAlk!" "Coming in
A minute, nurse! But I've got to see thAt the mouse doesn't get out." Only I don't think,' Alice
went on, 'thAt they'd let DinAh stop in the house if it begAn ordering people About like thAt!'
By this time she hAd found her wAY into A tidy little room with A tAbLe in the window, And
on it (As she hAd hoped) A fAn And two or three pAirs of tiny white kid gloves: she took up
the fAn And A pAir of the gloves, And wAs just going to leAve the room, when her eye fell
upon A little bottle thAt stood neAr the looking-glAss. There wAs no lAbel this time with the
words 'DRINK ME,' but nevertheless she uncorked it And put it to her lips. 'I know . . .
```

LinkedList (Loop) :

```
INFO: Running time for the read method with loop(LinkedList): 1951200.0 nanoseconds
```

```
INFO: Running time for the add method with loop(LinkedList): 2.04975E7 nanoseconds
```

...

```
Alas! it was too late to wish that! She went on growing, and growing, and very soon had
to kneel down on the floor: in another minute there was not even room for this, and she tried
the effect of lying down with one elbow against the door, and the other arm curled round
her head. Still she went on growing, and, as a last resource, she put one arm out of the
window, and one foot up the chimney, and said to herself 'Now I can do no more, whatever
happens. What WILL become of me?'
Luckily WONDERFUL for Alice, the little magic bottle had now had its full effect, and she grew no
larger: still it was very uncomfortable, and, as there seemed to be no sort of chance of her
ever getting out of the room again, no wonder she felt unhappy.
'It was much pleasanter at home,' thought poor Alice, 'when one wasn't always growing
larger and smaller, and being ordered about by mice and rabbits. I almost wish I hadn't gone
down that rabbit-hole—and yet—and yet—it's rather curious, you know, this sort of life! I
do wonder what CAN have happened to me! When I used to read fairy-tales, I fancied that
kind of thing never happened, and now here I am in the middle of one! There ought to be a
book written about me, that there ought! And when I grow up, I'll write one—but I'm grown
up now,' she added in a sorrowful tone; 'at least there's no room to grow up any more
HERE.'
```

...

```
INFO: Running time for the find method with loop(LinkedList): 974600.0 nanoseconds
```

```
INFO: This string found on 292. index.
```

```
INFO: Running time for the replace method with loop(LinkedList): 0.0 nanoseconds
```

```
INFO: It wAs the White Rabbit, trotting slowly bAck AgAin, And looking Anxiously About As it
went, As if it hAd lost something; And she heArD it muttering to itself 'The Duchess! The
Duchess! Oh my deAr pAwS! Oh my fur And whiskers! She'll get me executed, As sure As
ferrets Are ferrets! Where CAN I hAve dropped them, I wonder?' Alice guessed in A moment
thAt it wAs looking for the fAn And the pAir of white kid gloves, And she very good-nAturedly
begAn hunting About for them, but they were nowhere to be seen-everything seemed to
hAve chAnged since her swim in the pool, And the greAt hAll, with the gLAss tABle And the
little door, hAd vAnished completely.
Very soon the Rabbit noticed Alice, As she went hunting About, And cAllEd out to her in An
Angry tone, 'Why, MArY Ann, whAt ARE you doing out here? Run home this moment, And
fetch me A pAir of gloves And A fAn! Quick, now!' And Alice wAs so much frightened thAt
she rAn off At once in the direction it pointed to, without trying to explAin the mistAke it hAd
mAde.
'He took me for his housemAid,' she sAid to herself As she rAn. 'How surprised he'll be
when he finds out who I Am! But I'd better tAke him his fAn And gloves-thAt is, if I cAn find
them.' As she sAid this, she cAme upon A neAt little house, on the door of which wAs A bright
brAss plAtE with the nAme 'W. RABBIT' engrAved upon it. She went in without knocking,
And hurried upstAirs, in greAt feAr lest she should meet the reAl MArY Ann, And be turned out
of the house before she hAd found the fAn And gloves.
'How queer it seems,' Alice sAid to herself, 'to be going messAges for A rAbbit! I suppose
DinAh'll be sending me on messAges next!' And she begAn fAncying the sort of thing thAt
would hAppen: "'Miss Alice! Come here directly, And get reAdy for your wAlk!" "Coming in
A minute, nurse! But I've got to see thAt the mouse doesn't get out." Only I don't think,' Alice
went on, 'thAt they'd let DinAh stop in the house if it begAn ordering people About like thAt!'
By this time she hAd found her wAY into A tidy little room with A tABle in the window, And
on it (As she hAd hoped) A fAn And two or three pAirs of tiny white kid gloves: she took up
the fAn And A pAir of the gloves, And wAs just going to leAve the room, when her eye fell
upon A little bottle thAt stood neAr the looking-gLAss. There wAs no lABel this time with the
words 'DRINK ME,' but nevertheless she uncorked it And put it to her lips. 'I know . . .
```

LinkedList (Iterator) :

```
INFO: Running time for the read method with iterator(LinkedList): 1951500.0 nanoseconds
```

```
INFO: Running time for the read method with iterator(LinkedList): 1951500.0 nanoseconds
```

...

```
Alas! it was too late to wish that! She went on growing, and growing, and very soon had
to kneel down on the floor: in another minute there was not even room for this, and she tried
the effect of lying down with one elbow against the door, and the other arm curled round
her head. Still she went on growing, and, as a last resource, she put one arm out of the
window, and one foot up the chimney, and said to herself 'Now I can do no more, whatever
happens. What WILL become of me?'
Luckily WONDERFUL for Alice, the little magic bottle had now had its full effect, and she grew no
larger: still it was very uncomfortable, and, as there seemed to be no sort of chance of her
ever getting out of the room again, no wonder she felt unhappy.
'It was much pleasanter at home,' thought poor Alice, 'when one wasn't always growing
larger and smaller, and being ordered about by mice and rabbits. I almost wish I hadn't gone
down that rabbit-hole-and yet-and yet-it's rather curious, you know, this sort of life! I
do wonder what CAN have happened to me! When I used to read fairy-tales, I fancied that
kind of thing never happened, and now here I am in the middle of one! There ought to be a
book written about me, that there ought! And when I grow up, I'll write one-but I'm grown
up now,' she added in a sorrowful tone; 'at least there's no room to grow up any more
HERE.'
```

...

```
INFO: Running time for the find method with iterator(LinkedList): 0.0 nanoseconds
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INFO: This string found on 292. index.
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```
INFO: Running time for the replace method with iterator(LinkedList): 0.0 nanoseconds
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```
INFO: It wAs the White RABbit, trotting slowly bAck AgAin, And looking Anxiously About As it
went, As if it hAd lost something; And she heAnd it muttering to itself 'The Duchess! The
Duchess! Oh my deAr pAWs! Oh my fur And whiskers! She'll get me executed, As sure As
ferrets Are ferrets! Where CAN I hAve dropped them, I wonder?' Alice guessed in A moment
thAt it wAs looking for the fAn And the pAir of white kid gloves, And she very good-nAturedly
begAn hunting About for them, but they were nowhere to be seen--everything seemed to
hAve chAnged since her swim in the pool, And the greAt hAll, with the gLAss tABle And the
little door, hAd vAnished completely.
Very soon the RABbit noticed Alice, As she went hunting About, And cAlled out to her in An
Angry tone, 'Why, MArY Ann, whAt ARE you doing out here? Run home this moment, And
fetch me A pAir of gloves And A fAn! Quick, now!' And Alice wAs so much frightened thAt
she rAn off At once in the direction it pointed to, without trying to explAin the mistAke it hAd
mAde.
'He took me for his housemAid,' she sAid to herself As she rAn. 'How surprised he'll be
when he finds out who I Am! But I'd better tAke him his fAn And gloves--thAt is, if I cAn find
them.' As she sAid this, she cAME upon A neAt little house, on the door of which wAs A bright
brAss plAte with the nAme 'W. RABBIT' engrAved upon it. She went in without knocking,
And hurried upstAIRs, in greAt feAr lest she should meet the reAl MArY Ann, And be turned out
of the house before she hAd found the fAn And gloves.
'How queer it seems,' Alice sAid to herself, 'to be going messAges for A rABbit! I suppose
DinAh'll be sending me on messAges next!' And she begAn fAncying the sort of thing thAt
would hAppen: '"Miss Alice! Come here directly, And get reAdy for your wAlk!" "Coming in
A minute, nurse! But I've got to see thAt the mouse doesn't get out." Only I don't think,' Alice
went on, 'thAt they'd let DinAh stop in the house if it begAn ordering people About like thAt!'
By this time she hAd found her wAY into A tidy little room with A tABle in the window, And
on it (As she hAd hoped) A fAn And two or three pAIRs of tiny white kid gloves: she took up
the fAn And A pAir of the gloves, And wAs just going to leAve the room, when her eye fell
upon A little bottle thAt stood neAr the looking-gLAss. There wAs no lABel this time with the
words 'DRINK ME,' but nevertheless she uncorked it And put it to her lips. 'I know . . .
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