

Gebze Technical University
Computer Engineering

CSE 222
2017 Spring

HOMEWORK 3 REPORT

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1. System Requirements

Part1:

Bu partta StringBuilder class ının aynı görevlerini yapabilecek class implement edildi. Bu classda extradan 3 farklı toString methodu bulunmaktadır. Bunlardan birisi index ve get methodu ile ikincisi Iterator ile üçüncüsü ise LinkedList in toStringi ni kullanarak MyStringBuilder class ının toString i yazıldı.

Part2 :

Bu partta reverseToString methodu recursive olarak implement edildi ve mainde test edildi.

Part3 :

Bu partta myAbstractCollection class ı ve bu class ın için de appendAnything methodu implement edildi.

Part4 :

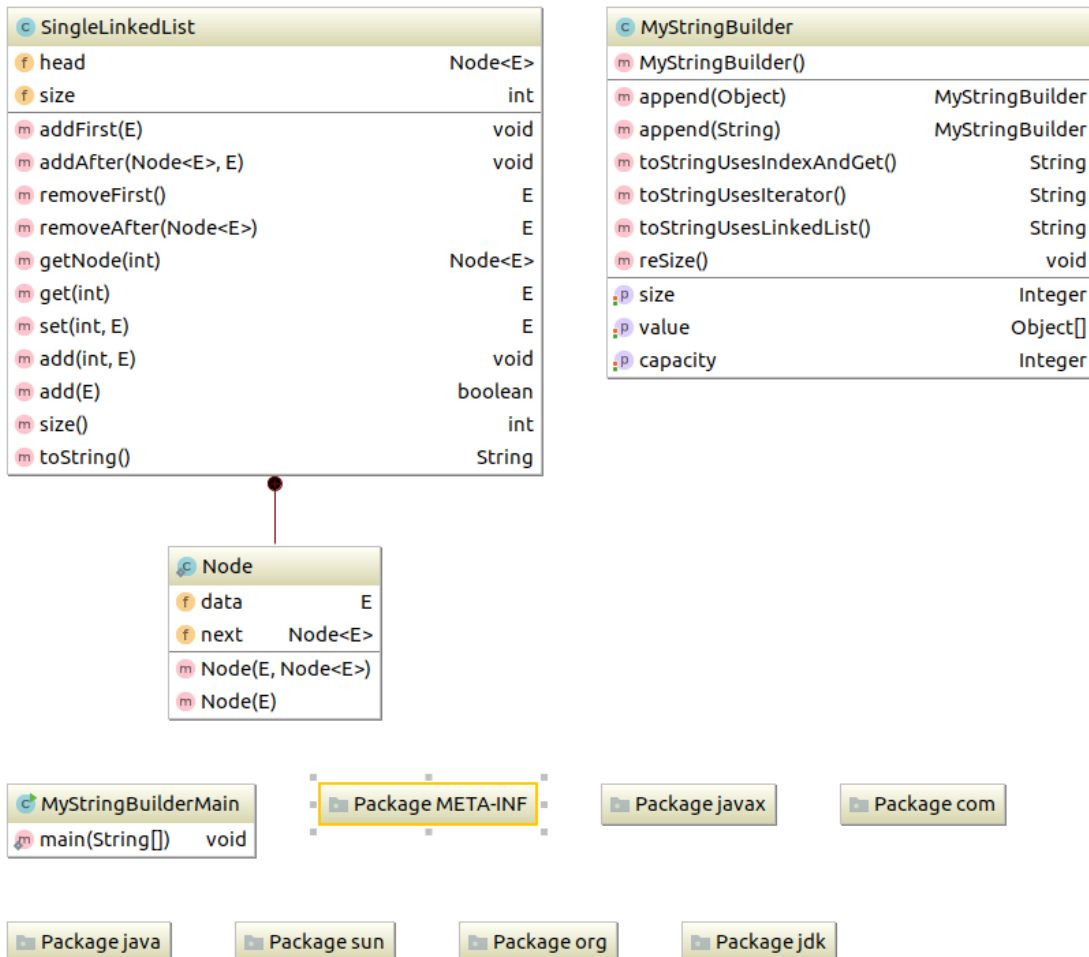
Bu partta SingleLinkedList silinen elemanlardan sonra nodeları tekrar kullanabilmek için tekrar implement edildi.

2. Use Case Diagrams

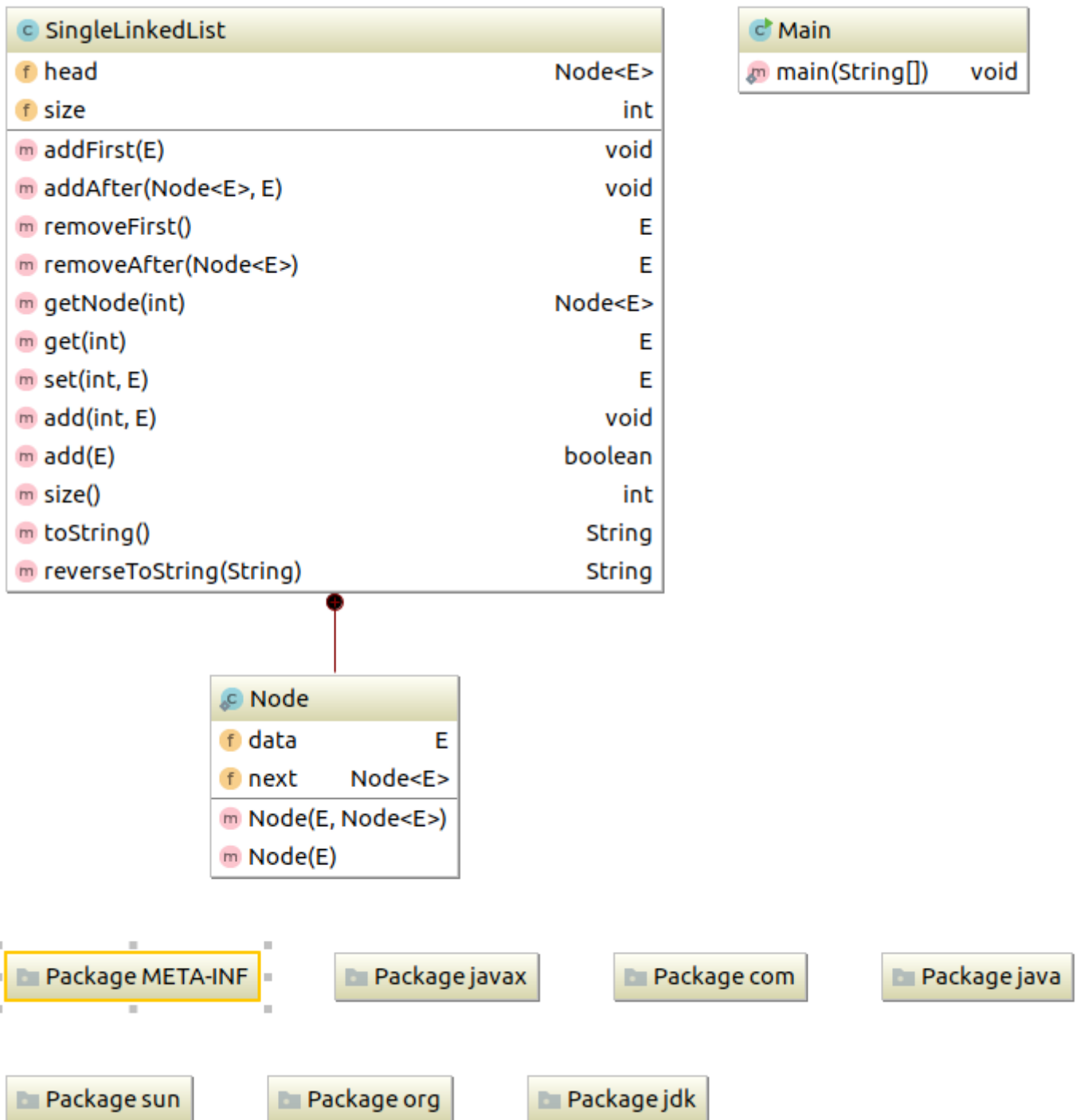
Add use case diagrams if required.

3. Class Diagrams

PART 1 Class Diagrams



PART 2



Part 3

MyAbstractCollection

m

iterator()

Iterator<E>

m

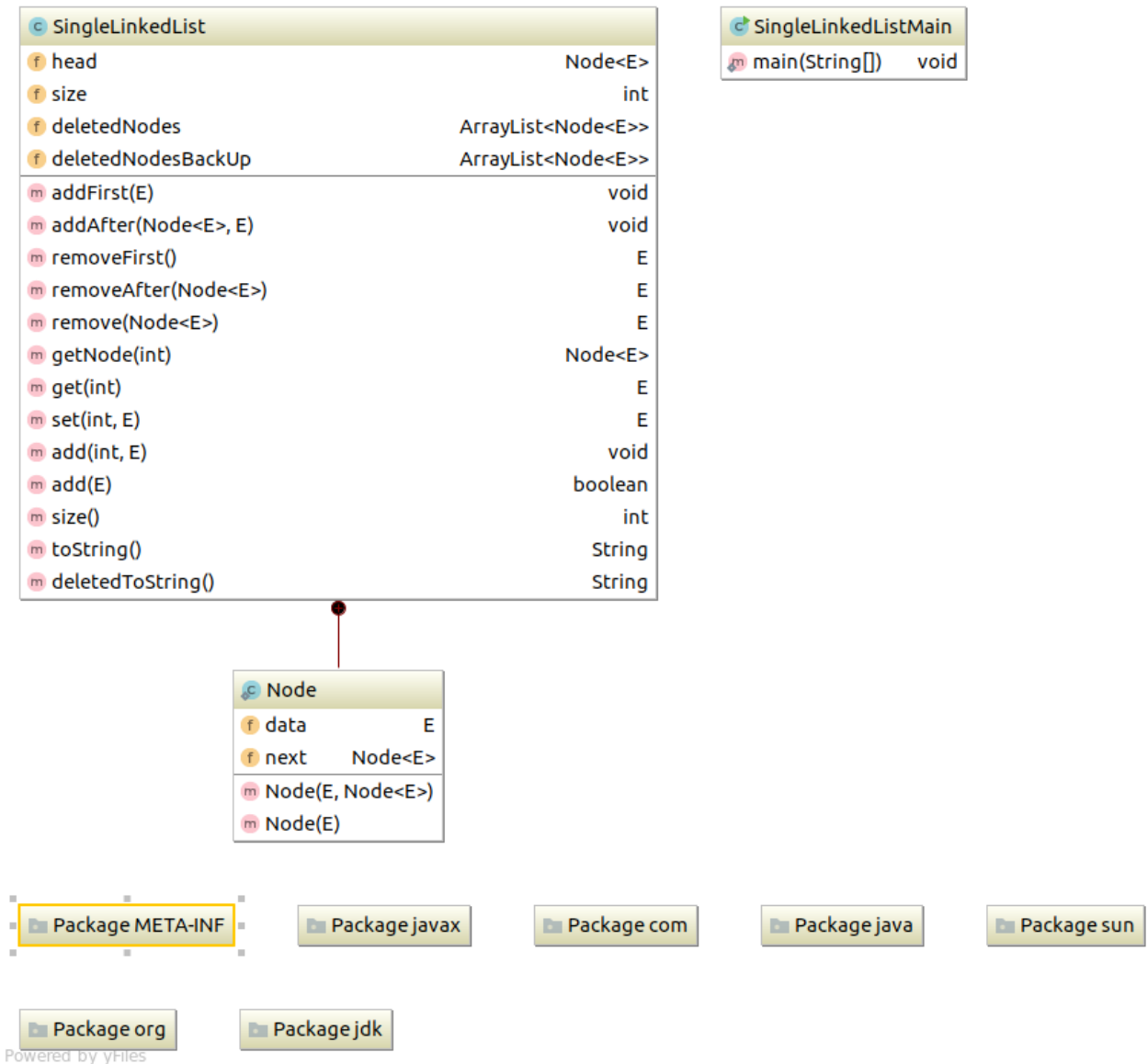
size()

int

m

appendAnything(MyAbstractCo





4. Other Diagrams

Add other diagrams.

5. Problem Solutions Approach

Problemleri çözmeye çalışırken olabildiğince en kısa ve seri yolu kullanılmaya çalıştım.
Part1 de

Daha Object Array i kullanarak implement ettiğim bu kısımda daima reallocate ederek String builder tarzında bir dinamiklik kazandırdım ve işlemin kısa bir süre içerisinde alınmasını sağladım.

Part2 de

Implement edilecek olan reverseToString methodunda kullandığım recursive kısımda en iyi verimle yazmaya çalıştım. Bu recursive call tamamlandığında time complexity si $O(n^2)$ olur.

Part3 de

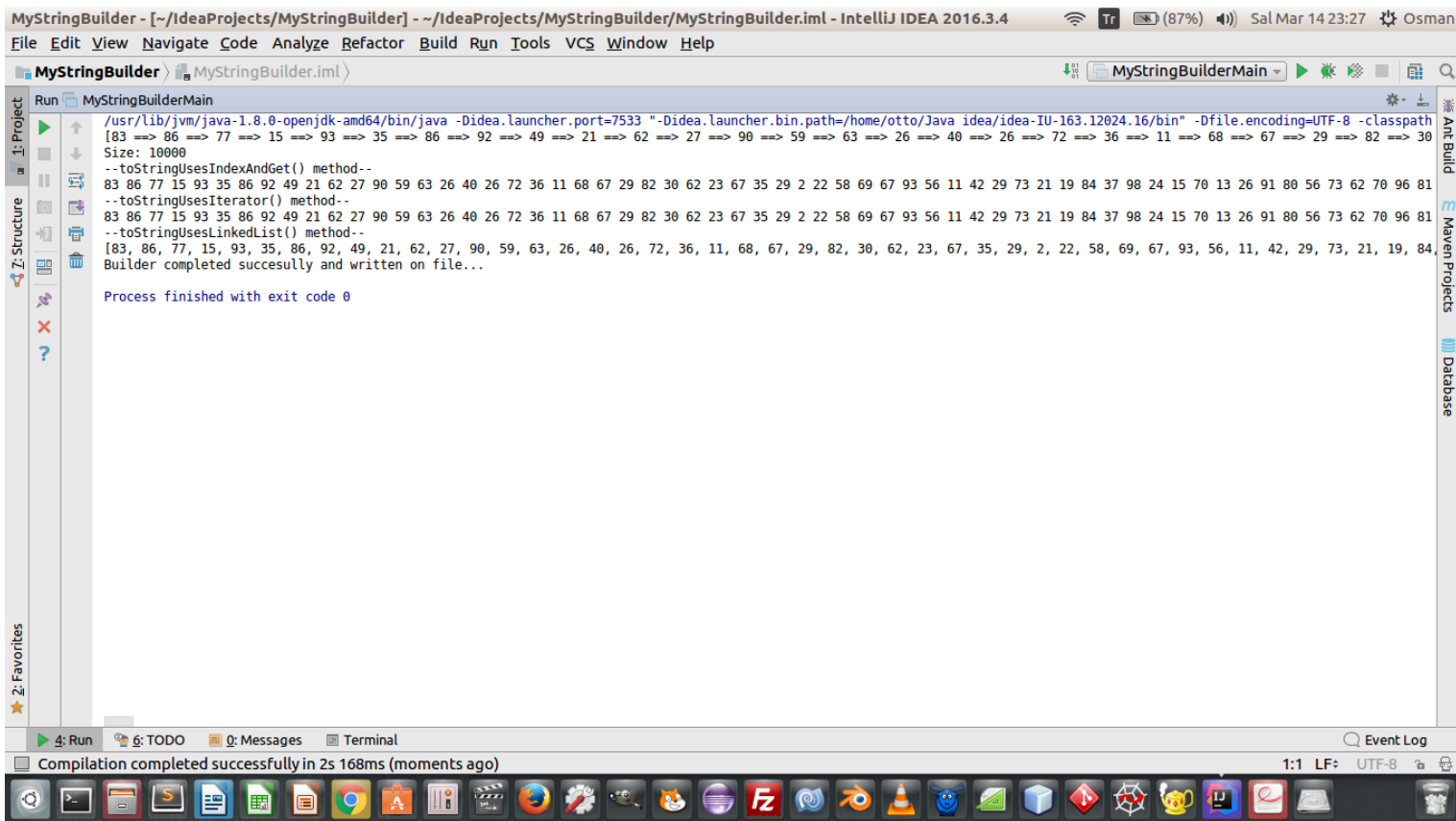
Burada herhangi iki şeyi birbirine append ederken extend ettiğim superclass ın methodundan yararlandım.

Part4 de

Garbage collector a daha az iş bırakmak için yeniden düzenlediğim SingleLinkedList methodlarıyla eklediği node lar eski sildiği node reference larını kullanarak yapıyor.

6. Test Cases

7. Running and Results



```
MyStringBuilder - [~/IdeaProjects/MyStringBuilder] --~/IdeaProjects/MyStringBuilder/MyStringBuilder.iml - IntelliJ IDEA 2016.3.4
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

MyStringBuilder > MyStringBuilder.iml > MyStringBuilderMain

Run MyStringBuilderMain
/usr/lib/jvm/java-1.8.0-openjdk-amd64/bin/java -Didea.launcher.port=7533 "-Didea.launcher.bin.path=/home/otto/Java_idea/idea-IU-163.12624.16/bin" -Dfile.encoding=UTF-8 -classpath
[83 ==> 86 ==> 77 ==> 15 ==> 93 ==> 35 ==> 86 ==> 92 ==> 49 ==> 21 ==> 62 ==> 27 ==> 90 ==> 59 ==> 63 ==> 26 ==> 40 ==> 26 ==> 72 ==> 36 ==> 11 ==> 68 ==> 67 ==> 29 ==> 82 ==> 30
Size: 10000
--toStringUsesIndexAndGet() method--
83 86 77 15 93 35 86 92 49 21 62 27 90 59 63 26 40 26 72 36 11 68 67 29 82 30 62 23 67 35 29 2 22 58 69 67 93 56 11 42 29 73 21 19 84 37 98 24 15 70 13 26 91 80 56 73 62 70 96 81
--toStringUsesIterator() method--
83 86 77 15 93 35 86 92 49 21 62 27 90 59 63 26 40 26 72 36 11 68 67 29 82 30 62 23 67 35 29 2 22 58 69 67 93 56 11 42 29 73 21 19 84 37 98 24 15 70 13 26 91 80 56 73 62 70 96 81
--toStringUsesLinkedList() method--
[83, 86, 77, 15, 93, 35, 86, 92, 49, 21, 62, 27, 90, 59, 63, 26, 40, 26, 72, 36, 11, 68, 67, 29, 82, 30, 62, 23, 67, 35, 29, 2, 22, 58, 69, 67, 93, 56, 11, 42, 29, 73, 21, 19, 84,
Builder completed successfully and written on file...

Process finished with exit code 0

4: Run 6: TODO 8: Messages Terminal
Compilation completed successfully in 2s 168ms (moments ago)
1:1 LF: UTF-8
```

reverseToString - [~/IdeaProjects/reverseToString] - Main.java - IntelliJ IDEA 2016.3.4

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

reverseToString

Run Main

```
/usr/lib/jvm/java-1.8.0-openjdk-amd64/bin/java ...  
-Testing the recursive reverse To String Method-  
The testing word is: Lorem ipsum dolor sit amet  
-After the reversing process-  
The testing word is: tema tis rolod muspi merol  
-Another testing-  
Reversed To String method: ]Lorem ipsum dolor sit amet >= tema tis rolod muspi merol[  
  
Process finished with exit code 0
```

4: Run 6: TODO Terminal 0: Messages

Compilation completed successfully in 1s 983ms (moments ago)

10:1 LF: UTF-8

SingleLinkedList - [~/IdeaProjects/SingleLinkedList] - [SingleLinkedList] - ~/IdeaProjects/SingleLinkedList/src/SingleLinkedListMain.java - IntelliJ IDEA 2016.3.4

File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help

SingleLinkedList

Run SingleLinkedListMain

```
/usr/lib/jvm/java-1.8.0-openjdk-amd64/bin/java ...  
List After added 100 elements  
[0 ==> 1 ==> 2 ==> 3 ==> 4 ==> 5 ==> 6 ==> 7 ==> 8 ==> 9 ==> 10 ==> 11 ==> 12 ==> 13 ==> 14 ==> 15 ==> 16 ==> 17 ==> 18 ==> 19 ==> 20 ==> 21 ==> 22 ==> 23 ==> 24 ==> 25 ==> 26 ==> 27 ==> 28 ==> 29 ==> 30 ==> 31 ==> 32 ==> 33 ==> 34 ==> 35 ==> 36 ==> 37 ==> 38 ==> 39 ==> 40 ==> 41 ==> 42 ==> 43 ==> 44 ==> 45 ==> 46 ==> 47 ==> 48 ==> 49 ==> 50 ==> 51 ==> 52 ==> 53 ==> 54 ==> 55 ==> 56 ==> 57 ==> 58 ==> 59 ==> 60 ==> 61 ==> 62 ==> 63 ==> 64 ==> 65 ==> 66 ==> 67 ==> 68 ==> 69 ==> 70 ==> 71 ==> 72 ==> 73 ==> 74 ==> 75 ==> 76 ==> 77 ==> 78 ==> 79 ==> 80 ==> 81 ==> 82 ==> 83 ==> 84 ==> 85 ==> 86 ==> 87 ==> 88 ==> 89 ==> 90 ==> 91 ==> 92 ==> 93 ==> 94 ==> 95 ==> 96 ==> 97 ==> 98 ==> 99]  
List after removed 50 elements  
[0 ==> 1 ==> 2 ==> 3 ==> 4 ==> 5 ==> 6 ==> 7 ==> 8 ==> 9 ==> 10 ==> 11 ==> 12 ==> 13 ==> 14 ==> 15 ==> 16 ==> 17 ==> 18 ==> 19 ==> 20 ==> 21 ==> 22 ==> 23 ==> 24 ==> 25 ==> 26 ==> 27 ==> 28 ==> 29 ==> 30 ==> 31 ==> 32 ==> 33 ==> 34 ==> 35 ==> 36 ==> 37 ==> 38 ==> 39 ==> 40 ==> 41 ==> 42 ==> 43 ==> 44 ==> 45 ==> 46 ==> 47 ==> 48 ==> 49 ==> 50 ==> 51 ==> 52 ==> 53 ==> 54 ==> 55 ==> 56 ==> 57 ==> 58 ==> 59 ==> 60 ==> 61 ==> 62 ==> 63 ==> 64 ==> 65 ==> 66 ==> 67 ==> 68 ==> 69 ==> 70 ==> 71 ==> 72 ==> 73 ==> 74 ==> 75 ==> 76 ==> 77 ==> 78 ==> 79 ==> 80 ==> 81 ==> 82 ==> 83 ==> 84 ==> 85 ==> 86 ==> 87 ==> 88 ==> 89 ==> 90 ==> 91 ==> 92 ==> 93 ==> 94 ==> 95 ==> 96 ==> 97 ==> 98 ==> 99]  
Deleted Nodes  
[ 99-->98-->97-->96-->95-->94-->93-->92-->91-->90-->89-->88-->87-->86-->85-->84-->83-->82-->81-->80-->79-->78-->77-->76-->75-->74-->73-->72-->71-->70-->69-->68-->67-->66-->65-->64-->63-->62-->61-->60-->59-->58-->57-->56-->55-->54-->53-->52-->51-->50-->49-->48-->47-->46-->45-->44-->43-->42-->41-->40-->39-->38-->37-->36-->35-->34-->33-->32-->31-->30-->29-->28-->27-->26-->25-->24-->23-->22-->21-->20-->19-->18-->17-->16-->15-->14-->13-->12-->11-->10-->9-->8-->7-->6-->5-->4-->3-->2-->1-->0]  
List After added 100 elements again.  
[0 ==> 1 ==> 2 ==> 3 ==> 4 ==> 5 ==> 6 ==> 7 ==> 8 ==> 9 ==> 10 ==> 11 ==> 12 ==> 13 ==> 14 ==> 15 ==> 16 ==> 17 ==> 18 ==> 19 ==> 20 ==> 21 ==> 22 ==> 23 ==> 24 ==> 25 ==> 26 ==> 27 ==> 28 ==> 29 ==> 30 ==> 31 ==> 32 ==> 33 ==> 34 ==> 35 ==> 36 ==> 37 ==> 38 ==> 39 ==> 40 ==> 41 ==> 42 ==> 43 ==> 44 ==> 45 ==> 46 ==> 47 ==> 48 ==> 49 ==> 50 ==> 51 ==> 52 ==> 53 ==> 54 ==> 55 ==> 56 ==> 57 ==> 58 ==> 59 ==> 60 ==> 61 ==> 62 ==> 63 ==> 64 ==> 65 ==> 66 ==> 67 ==> 68 ==> 69 ==> 70 ==> 71 ==> 72 ==> 73 ==> 74 ==> 75 ==> 76 ==> 77 ==> 78 ==> 79 ==> 80 ==> 81 ==> 82 ==> 83 ==> 84 ==> 85 ==> 86 ==> 87 ==> 88 ==> 89 ==> 90 ==> 91 ==> 92 ==> 93 ==> 94 ==> 95 ==> 96 ==> 97 ==> 98 ==> 99]  
Deleted Nodes  
[ ]  
  
Process finished with exit code 0
```

Terminal 4: Run 6: TODO

All files are up-to-date (moments ago)

14:1 LF: UTF-8