CSE222 HOMEWORK 3 REPORT

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## **Experimental Running Time Analysis**

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| --- | --- | --- | --- | --- |
| IMPLEMENTATION TYPE | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
| Basic Array Structure | 0.190294 s | 0.295658 s | 0.321812 s | **X** |
| Array List Structure | 0.175403 s | 0.299364 s | 0.339811 s | 0.445652 s |
| Linked List Structure | 0.233015 s | 0.306568 s | 0.320371 s | 0.437014 s |
| LD Linked List Structure | 0.223557 s | 0.317878 s | 0.388662 s | 0.442548 s |

## **Theorical Running Time Analysis**

* Basic Array:
  + - add() : O(n)
    - access element : O(1)
    - remove() O(n)
    - length(): O(1)
* Array List:
  + - add() : O(1)
    - get() : O(1)
    - remove() O(n)
    - size(): O(1)
* Linked List:
  + - add() : O(1)
    - get() : O(n)
    - remove() O(n)
    - size(): O(1)
* Lazy Derivation Linked List:
  + - add() : O(1)
    - get() : O(n)
    - remove() O(n)
    - size(): O(n)

## **Problem solution approach for LDLinkedList**

1. I implemented an Abstract List structure called LinkedList myself.
2. I created the basis of the linked list structure
3. head node
4. Node static class
5. get(), size(), add(), and myremove() methods
6. myremove() method use pureRemove() method depends on the marked value.
7. I implement a marked boolean value and markedObject.
8. If marked is false, it means it is the first remove process; if it is true, it means it is the second remove process. In first remove process it will not remove and mark that object, in second remove process it will remove that object and marked object.
9. markedObject holds the object that marked in first remove process.
10. I implement getter() and setter() methods

## **Running Command**

Text

Description automatically generated



NOTE: Results in the .txt files in .zip file too.

## **Results Array List Test1**

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Description automatically generated

Text

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## **Results Array List Test2**

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## **Results Array List Test3**

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## Text Description automatically generatedText Description automatically generatedText Description automatically generated**Results Array List Test4**

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## **Results Linked List Test1**

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## **Results Linked List Test2**

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## **Results Linked List Test3**

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## **Results Linked List Test4**

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## **Results LD Linked List Test1**

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## Text Description automatically generated**Results LD Linked List Test2**

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## **Results LD Linked List Test3**

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## Text Description automatically generated**Results LD Linked List Test4**

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