Reverse a Linked List

Java

Reverse a Linked List without using extra space.

```
Old List
1 -> 2 -> 3 -> 4 -> null
New List
4 -> 3 -> 2 -> 1 -> null
```

Iterative Method

Time complexity - O(n)

Space complexity - O(1)

```java
public void reverseList() {
        if(head == null || head.next == null) {
            return;
        }

        Node prevNode = head;
        Node currNode = head.next;
        while(currNode != null) {
            Node nextNode = currNode.next;
            currNode.next = prevNode;
            prevNode = currNode;
            currNode = nextNode;
        }
        head.next = null;
        head = prevNode;
    }
```

Recursive Method

Time complexity - O(n)

Space complexity - O(1)

```
public Node reverseListRecursive(Node head) {

       //empty node || last node or only one node

       if(head == null || head.next == null) {

           return head;

       }


       Node newHead = reverseListRecursive(head.next);


       head.next.next = head;

       head.next = null;

       return newHead;

   }
```

Collections Method

Time complexity - O(n)

Space complexity - O(1)

```
LinkedList<Integer> list2 = new LinkedList<>();

       list2.add(1);

       list2.add(2);

       Collections.reverse(list2);
```

Homework Problems

1. https://leetcode.com/problems/swap-nodes-in-pairs/
2. https://leetcode.com/problems/remove-nth-node-from-end-of-list/
3. https://leetcode.com/problems/reverse-linked-list-ii/
4. https://leetcode.com/problems/remove-nth-node-from-end-of-list/