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COP3530 PA1 Commentary

What is the computational complexity of the methods in the implementation?

(The analysis below does not take the time complexity of the std built-in functions into consideration. However, since most of the functions deal with the string input, which is limited to 80 characters per run through of each method, they should not affect the Big-O of the methods below.)

- LinkedList methods:
    - getSize()
        - O(1)
    - insertEnd()
        - O(n)
    - insert(string input, int index)
        - O(n)
    - remove(int index)
        - O(n)
    - edit(string input, int index)
        - O(n)
    - print()
        - O(n)
    - search(string input)
        - O(n)
- Editor Methods:
    - O(n) each (because of their corresponding LinkedList function)
    - O(1) if the input is invalid

Your thoughts on the use of linked lists for implementing a line editor. What are the advantages and disadvantages?

- Advantages
    - No line limits
        - There is no need to re-allocate for a new array if the number of lines exceed the array size as linked list can grow and shrink as needed.
- Disadvantages
    - The need to traverse the list to get to a line

        - Even with an iterator, there is still a need to traverse the list to get to certain index positions since there is no cursor in the line editor.
    - More storage usage
        - By using a linked list, we are storing a node, which includes a pointer and a value; and this would take up more space in the memory than simply using arrays, which require storage for only the values.

What did you learn from this assignment and what would you do differently if you had to start over?

- I would familiarize myself with the C++ language and compiler more before starting to code for the assignment. This would help me avoid spending unnecessary debugging on simple mistakes made due to language syntax differences.
- I would make a node pointing to the last item in the linked list. This will make the insertEnd() function more efficient as there is no need to traverse the list anymore.