

# Project 1: Commentary

- **What is the computational complexity of the methods in the implementation?**
  - `splitString()`
    - Helper method used to split a given string into a string vector. The extraction is utilized to extract the first input as well as (if needed) index.
    - Takes in a string, and runs `std::stringstream ss(input)`, which is a computational complexity of  $O(n)$ ,  $n$  being amount of words within the input sentence separated by whitespace.
  - `cleanUpString()`
    - Helped method used to essentially reverse `splitString()` method, while removing the quotes ("").
    - Runs through the vector of strings (the entire sentence input separated by whitespaces) twice, thus  $O(2n)$  or properly written  $O(n)$ .
  - `insertEnd()`
    - Inserts new node at the end of `LinkedList`.
    - Runs for  $O(n)$ .
  - `insertIndex()`
    - Inserts new node at the given index.
    - Worst case for  $O(n)$ , best case  $O(1)$ , realistically  $O(\text{inputted index})$ .
  - `deleteIndex()`
    - Deletes at the given index.
    - Same as above; worst case for  $O(n)$ , best case  $O(1)$ , realistically  $O(\text{inputted index})$ .
  - `edit()`
    - Edit a given index.
    - Same as above; worst case for  $O(n)$ , best case  $O(1)$ , realistically  $O(\text{inputted index})$ .
  - `print()`
    - Print the values of all nodes of the `LinkedList`.
    - Exactly  $O(n)$ , as it has to traverse through the `LinkedList` to print.
  - `search()`
    - Searches within the `LinkedList`.
    - Traverses through the entire list to search, thus  $O(n)$ .
- **Your thoughts on the use of linked lists for implementing a line editor. What are the advantages and disadvantages?**
  - More bothersome than it needs to be. Utilizing `vector<vector<string>>` would've been much easier, and allowed much more versatility. `LinkedList` is disadvantageous due to their lack of native support by C++, like vectors.

- Advantages include memory size (small), being a dynamic data structure, and finally relatively easy to implement.
- **What did you learn from this assignment and what would you do differently if you had to start over?**
  - If I was to start over, I would probably have implemented `splitString()` and `cleanUpString()` differently.
  - Didn't learn much from the assignment -- we programmed a `LinkedList` that was honestly 5x harder during Programming 2 (double linked list).