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Assignment 7 Analysis

1. Have you worked with more than one partner yet?

I have not. I am still looking for a different partner for the next assignment.

2. In the LinkedListStack class, the stack data structure is implemented using a doubly-linked list. Would it be better to use a singly-linked list instead?

It is tough for me to say it would be "better" because they both essentially do the same thing. We would save a slight amount of space because we would only be keeping track of the "next" reference in a singly-linked list, rather than both "next" and "previous" in the doubly-linked list. It also differs because we would need to add at the beginning of the singly-linked list instead of adding at the end like we do with the doubly-linked list. But because the complexity of deleting from the beginning or end of a linked list is the same (O(c)) this doesn't have any effect on the choice. If the space saved from only keeping track of one reference is important, then yes, it may be better to use a singly-linked list.

3. Would it be possible to replace the instance of DoublyLinkedList in the LinkedListStack class with an instance of Java's LinkedList? Why or why not?

Yes. My DoublyLinkedList and Java's LinkedList would serve the same purpose in this case, and the Java LinkedList is actually a doubly-linked list too. They both have the necessary methods to complete the tasks from the LinkedListStack class.

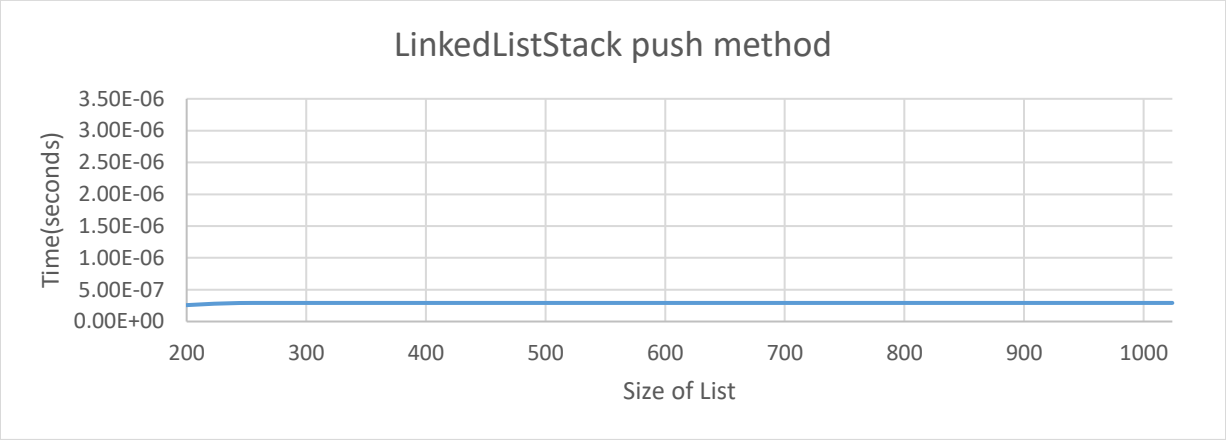
4. Comment on the efficiency of your time spent developing the LinkedListStack class.

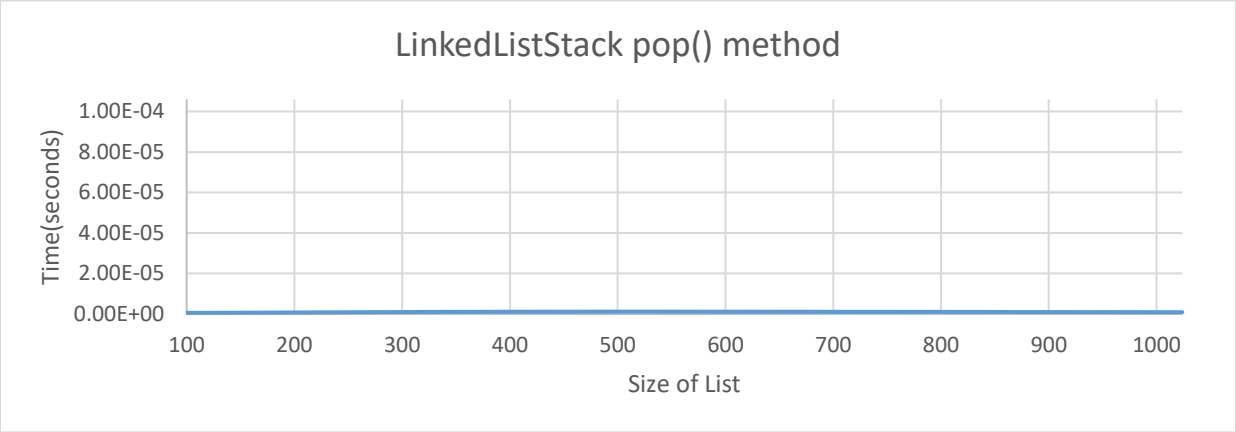
The development of the LinkedListStack class was very simple. Some of the methods like clear, isEmpty, and size were as easy as calling the same method but from the DoublyLinkedList class. The other methods were also easy, I just had to make sure I called the right method from DoublyLinkedList (making sure to use getLast for the peek method, addLast for the push method, etc.).

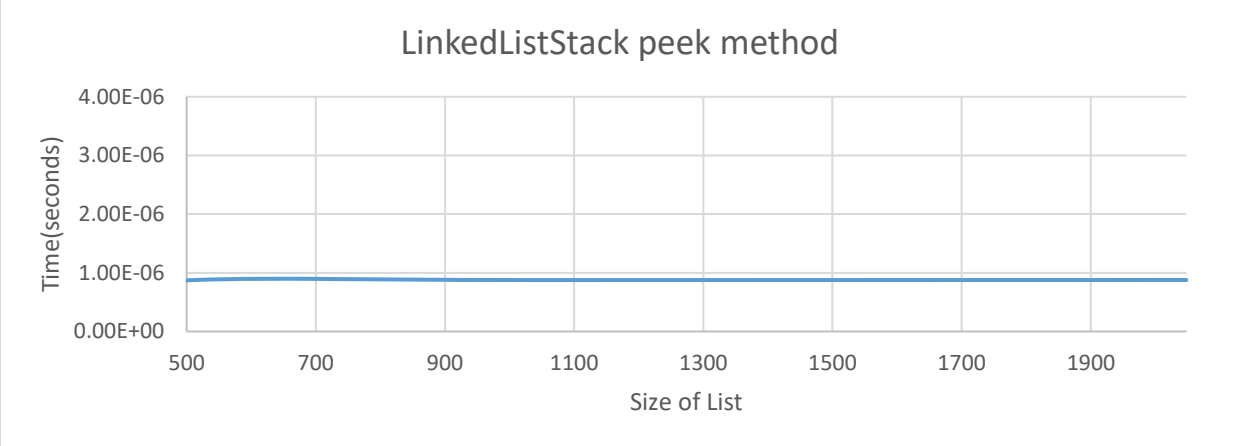
5. Note that the line and column number given by BalancedSymbolChecker indicate the location in a file where an unmatched symbol is detected (i.e., where the closing symbol is expected). Explain how you would also keep track of the line and column number of the unmatched opening symbol.

I would solve this problem by adding data values of the line number and column number to the node when a symbol is added to the stack. It would require some modification of the DoublyLinkedList Nodes to hold that data and also the add methods to handle the passing of the new line and column arguments.

6. Collect and plot running times in order to determine if the running times of the LinkedListStack methods push, pop, and peek are O(1) as expected.







7. How many hours did you spend on this assignment?

I spent a little over 8 hours on this assignment.