Assignment 5

SpellChecker using Binary Search Trees

CSCI-C 202

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Abstract

Programming Assignment Five is extremely very similar to Program Assignment Four except for the format used. Instead of implementing LinkedLists as we did in Assignment Four, we are utilizing Binary Search Trees. Binary Trees are a hierarchal structure that contains a root, two binary subtrees and leaves. Each binary tree consists of an element or is empty and is divided into two subtrees. In Assignment Four, we used LinkedLists to compare two files to find the common words between the two. LinkedLists are linear structures and are used when information is either added or removed. This can be time consuming however, and since Binary Trees are a hierarchal structure, they are less time consuming than LinkedLists.

As such, the program in Assignment Four is similar to Assignment Five, but a few methods were changed, specifically the contains and add methods. As well as the name of the data structures within the program, i.e MyLinkList changed to BinarySearchTrees. The type of process the code for Assignment Five goes through is still similar to LinkedLists, however, instead of going through each word character by character til the end of the word, Binary Search Trees will go as far as needed in order for the program to recognize if that word is in the dictionary text file. If it is not, it stops the process and goes to the next word hence why there are fewer comparisons than in Assignment Four.

Using the Assignment Five's program allows the user to increase the accuracy and effectiveness of searching for word found within the oliver text file that are also within the dictionary text file. It is less time consuming than LinkedLists due to what was mentioned above. Because of this time efficiency, the time complexity of a balanced Binary Search Tree is O(log n). A time complexity that is faster and process more accurately than its predecessor in Program Assignment Four. This can be seen in the results as Assignment Four took 33 secs to build successfully while Assignment Five took only a measly second.