

### **COP 3502 Suggested Program Edits: Binary Search Tree Insert, Tries (Week 8 Programs)**

- 1) In the posted code `bintree2.c`, there is a function `numNodesOneChild`, that returns the number of nodes in a binary tree with one child. Write a similar function, `numNodesTwoChildren`, that returns the number of nodes in a binary tree with two children.
- 2) The goal of `bintreeexample.c` is to find the average height of a tree created with a million random inserts. Another item of interest would be the sum of the differences between the left and right subtrees of every node. Add a function to `bintreeexample.c` that takes in a pointer to the root of a tree and returns the sum of these differences. If a node has a null child, we consider the child's height to be -1.
- 3) One way to deal with tied elements in a binary tree of integers is to store two pieces of information in the node - the value that is being stored and its frequency, the number of times it has occurred. This way, in the tree, all items to the left of a node will be strictly less than it, and all items greater than a node will be greater than it. Edit `bintree2.c` to work this way.
- 4) Add a function to any of the trie examples that counts the number of different nodes in a trie and returns this value.
- 5) Often times, there are common suffixes of words, such as "ing." One might want to count how many words have a particular suffix. Find a way to edit the example `countprefixes.c` so that it counts the number of words with a particular suffix. (Hint: You won't actually change any of the code in the `numPrefix` function at all!!! Instead, you'll store something a bit different in the trie and search for something a bit different in it.)