CSC2001F: Data Structures 1

Assignment 2: Binary Search Trees

Duration: 9 days

[Start: 10 March 2014; **Due**: 19 March 2014, 9am]

In this assignment you will use the names and surnames in *toSearchIn.txt* (the same file used in the previous assignment) in order to tally and print out, the popularity of each of the names and surnames in Bob's friend list. Maintain two separate BSTs (one for names and one for surnames).

A node in the name BST stores a name, a counter for the number of occurrences of that name, a key (sum of chars of the name) and references to its left and right children.

A node in the surname BST stores a surname, a counter for the number of occurrences of that surname, a key (sum of chars of the surname) and references to its left and right children.

Output:

Traverse the name tree **in order** to print out each key, name and the number of occurrences of that name.

Traverse the surname tree **post order** in order to print out the key, surname and the number of occurrences of that surname.

Note: The following instructions apply to both names and surnames. Keys may not be unique to a name (i.e. characters of different names may sum to the same value, resulting in different names having the same key). To prevent the counter for a name being incremented when a different name matches that same key, do the following:

- In the method that adds a node to the tree, check whether the key of the node to be added matches that of the current node it is being compared to. If it matches, check whether the new node's name string is equal to the name string of the current node it is being compared to. If it matches, increment the counter of the node representing that name. If it is in fact a different name mapping to the same key, add the new node to the left subtree of the current node.

Sample Output

Name BST Traversed In Order
key: 174, name: Ma, count: 1
key: 177, name: Bo, count: 1
key: 179, name: Ji, count: 2
…….
…….
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Surname BST Traversed Post Order
key: 206, surname: Yu, count: 1
key: 197, surname: Ly, count: 1
key: 183, surname: Oh, count: 1
…….