Lab 5 Purpose

The Purpose of this lab is to be able to work with both Binary Search Trees and Hash tables which need to be able to function with two text files. Meaning that the user will need to choose what method they want to use which is BST or Hash and once they selected it, the program will need to read the files and create the BST and the Hash table with the information that they contain. In addition to creating the BST and Hash table, I need to be able to show the number of nodes, the height of the BST, the running time it took to build it. After that is done I need to use the second file that contains a list of words that are side by side and compare them and get the similarity value of both words which requires the use of the first text file and an equation. When focusing on the Hash table I need to demonstrate the initial and final size of the table, then get the load factor of the hash, find the percentage of the empty lists, and get the standard deviation of the length of the lists. Again, I need to compare both words from the second text file that is made by me and compare them. Once I compare all the words in the text file I need to get the running time of how long it took to build the hash table.

**Prompt the User to Choose a Table Implementation**

**Objective**

To begin this initial part of the program, I first need to create a code that asks for the user’s choice on what table implementation the want to use, with either of them being Binary Search Tree or Hash Tables.

**Proposed Solutions**

The proposed solution for this part is really simple which here I will depend on the basics of Computer Science. To begin I know that I need to start of by asking the user what table they want which will be a Binary Search Tree or a Hash table. Once the code asks them what they can choose, the code will give them the option to input 1 for BST or 2 for HT. After the user makes their input, the input they made will go into an if statement where if they chose 1 then the program calls the method to create the BST or if they chose 2 then the program calls the method to build the Hash Table.

**Implementation**

To begin creating this I first off started by printing “Choose table implementation” then after that line of code, I made the variable x to store the input of the user. In the same line where I store the input from the use, I print ‘Do you want a Binary search tree (BST) or Hash Table with chaining (HT)? select l for BST or 2 for HT: ’. However, once the user inputs their choice I declare to variables called f1 and f2 which will open the two text files, but once I open them I need to type the name of the text files exactly by how its shown in the computer and to be able to completely read the file I needed to use the encoding variable and store ‘utf-8’.

Now that everything is set up, I made an if statement where if x is equals to 1 then I print ‘Building binary search tree’ and call the method to build the BST which passes the two text files. However, if x is equals to 2 the I print ‘Building Hash Table’ and call the method to build the hash table which passes the two text files.