Assignment 4 - Binary Search Trees

1 Problem Statement

In this assignment you are required to implement a binary search tree based spell checking system. Initially you will be given a dictionary of words to build your binary search tree ,the comparison between strings will be based on strcmp function available in c function. During building your BST ,you are required to ensure that your tree is balanced. After finishing the BST you are required to print the height of the generated tree. Then you will be provided with a sentence to spell check. Then you will be required to determine if the word is in your tree or not

1. If it is in your tree then you will print that the word is correct
2. If it isn't then you will print three suggestions for the correct word,The word in the leaf node you reached ,the word in the predecessor node and the node in the successor node.

2 Binary Search Tree Implementation

A binary search tree is a data structure in which each node has only two children node , each of these children will either be a leaf node or a root for another binary search tree
Each node has a comparable key , where for a given root node all its children nodes on its left will have a key less than its own key and all children on the right will have a key more than the root's

In this assignment, you are required to implement a **binary search tree** for storing and retrieving **text**

Important Definitions:

- Successor Node : In Binary Search Tree, Inorder Successor of an input node can also be defined as the node with the smallest key greater than the key of input node.
- Predecessor Node : In Binary Search Tree, Inorder Predecessor of an input node can also be defined as the node with the greatest key less than the key of input node.
- For further explanataion you can see this video :
  https://www.youtube.com/watch?v=psFKTGahpCs

3 Application

You will be provided with a text file containing a dictionary for the English language,you will use that file to build you binary search tree and then use that search tree for search and retrieval purposes.

4 Deliverable

- This assignment will be delivered online so you have to ensure that the code you are sending works properly and your report is sufficiently detailed.
- You should deliver your codes for the binary search tree generation which enables us to test the spell checking capabilities and provide the correct suggestions as detailed previously in this document
- Report
  - Describes your documented codes and screen shots of the output screens,showing multiple test cases.

5 Notes

- You should work in groups of 3.
- Your implementation should be in C language.
- Copied assignments will be assigned zero in the all of the coursework.

Good Luck