

Alexandria University
Faculty of Engineering
Specialized Scientific Programs
Computer & Communication Program
Spring 2025



Data Structures (1)
Course Code: CSE127
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BST Dictionary Assignment

1. Problem Statement

In this assignment, you are required to implement a spell-checking system based on a binary search tree. You will be given a file containing all language words. The file would contain one word per line. At the beginning, print the count and height of the generated **Binary Search Tree**. Your program should prompt the user to enter a sentence to check its spelling.

For each word in the entered sentence, you check whether the word exists in the binary search tree.

(a) If the word exists, you will print that the word is correct.

(b) If the word does not exist, you will print three suggestions for the correct word:

A. The word in the last node you reached before declaring that the word does not exist.

B. The word in the inorder predecessor of that node in Part A.

C. The word in the inorder successor of that node in Part A.

2. Definitions

In Binary Search Tree, the inorder successor of an input node is defined as the node with the smallest key greater than the key of the input node.

Similarly, the inorder predecessor of an input node is defined as the node with the largest key smaller than the key of the input node.

For further explanation you can see this [video](#).

3. Application

When your program starts it loads the text file by default and print the size and height of tree then It will ask user to enter a sentence and check for each word in the sentence if it exists in the dictionary or not and if not it should print the three suggestions as mentioned above in part 1.

Sample Run

```
Dictionary Loaded Successfully...!
.....
Size = 97462
.....
Height = 38
.....
Enter a sentence :
I wrot ths assignmet mysel
I - CORRECT
wrot - Incorrect, Suggestions : wrote wroth wrongs
ths - Incorrect, Suggestions : thruways Thucydides thruway's
assignmet - Incorrect, Suggestions : assigns assimilate assignments
mysel - Incorrect, Suggestions : mys myself myrtles
Process returned 0 (0x0)   execution time : 0.012 s
```

[Hint] Use the strcasecmp C function to compare strings while building the Binary Search Tree or while looking up/inserting a word.

4. Bonus

Implement the dictionary using AVL Tree to maintain the complexity of search and insert operations to be $O(\log n)$.

5. Deliverables

- Your source code (in one C file).
- You should work in groups of **two**.