CSE201 – Data Structures – Fall 2023

ASSIGNMENT#2 - (Due date: 26/12/2023 Tuesday, at 23:59)

- All implementation must be done with a **binary search tree (BST)** data structure.
- This assignment effects overall 15% of your final grade.
- Project groups are allowed. A group may consist of **at most** 2 people.
- The code may be written in C, Java or Python.
- Report submission is mandatory. You must submit a report in addition to project files.

English-Turkish Dictionary Application

- Assignment will not be graded unless done with BST. This project is given to strengthen knowledge about BST.
- **It is forbidden to use ready classes such as the TreeSet class under java.util**.
- The dictionary application, keeps the word/phrase information and the meaning of the word.
- Each word/phrase assumed to be a node in the tree must have the properties in Figure 1:

```c
struct bin_tree_node_word {
    char word[100];
    char turkishEquivalent[100];
    char meaning[200];
    struct bin_tree_node_word* left;
    struct bin_tree_node_word* right;
}
```

Figure 1- Sample tree node struct written in C.

- A sample tree is illustrated in Figure2.
- Note that, each "word" is unique.
- BST is constructed sorted alphabetically due to the "word" property.
- Words that occur alphabetically earlier will be placed on "left" side of the tree.
- Words that are later alphabetically will be placed on "right" side of the tree.

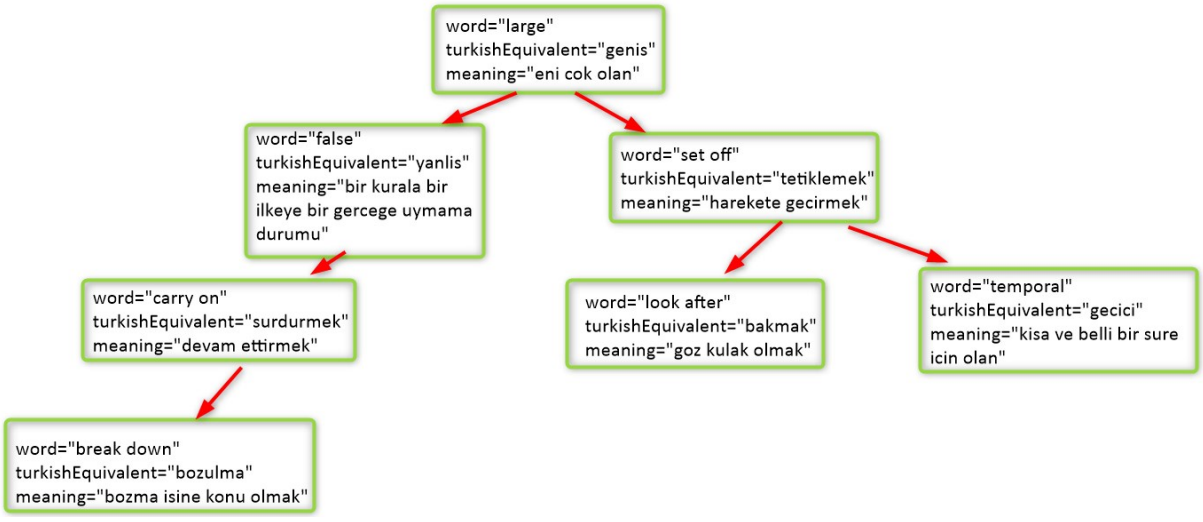

Figure 2- Sample tree illustration.

Instructions

1. **Load initial data (10 pts):** When the program runs for the first time, the records in "inputBst.txt" file must be inserted to binary search tree in an order. You can insert the data directly from txt file or (if you have problem while loading the file) you can insert the data as hard code in code behind.

2. **Menu (10 pts):** The program must have a menu that enables the user to select the required operation. Your program must do the operations between instruction 3 and instruction 7.

3. **Insert a new node (20 pts):** If user selects this operation; she/he is prompted to enter word, Turkish equivalent and meaning properties. The word record is added to the tree sorted alphabetically due to the word. If you examine the sample illustration in Figure 2, all records are placed alphabetically ordered due to the word.

4. **Search for a word(20 pts):** If user selects this operation; she/he is prompted to enter a word. If the word exists in the tree than, word's Turkish equivalent and the meaning are listed. If the word is not in the list than "Word not found in the binary search tree" message must be printed to screen.

5. **Print in-order (10 pts):** Word, Turkish equivalent and the meaning properties of all records are printed according to "in-order traversal".

6. **Print post-order (10 pts):** Word, Turkish equivalent and the meaning properties of all records are printed according to "post-order traversal".

7. **Print pre-order (10 pts):** Word, Turkish equivalent and the meaning properties of all records are printed according to "pre-order traversal".

8. **Report submission (10 pts):** You must prepare a report for your projects. A sample report file is attached please fill all necessary parts in the report. The screenshots in the report are necessary in case your applications can not run in my computer.

Submission Details

- Please send your projects on time. <u>If you submit your project late, you will lose 5 points for each late days.</u> Please keep this in mind and promptly start working on your projects.
- Project files and the report (docx or pdf) must be compressed as a **single zip** file.
- Submit the compressed **single zip** file via **aduzem**.
- Zip file must be named with all group members' student numbers (example→ 2007900011_2007900012.zip).
- One of the group members may submit the assignment.
- In any forms of copying and cheating all parties will get zero grade from assignment#2.

Good Luck!