

COMP 282 Project 2

Due: April 10, 11:59 PM

In this project you will be implementing a very basic search engine. The program begins by parsing a collection of text files. Then the user can give single-word queries, and the program returns the names of the files that contain the query word. In other words you need to create a dictionary ADT that maps each word to a list of files containing that word. You need to write the following implementations of the Dictionary ADT:

1. an unbalanced binary search tree
2. an AVL tree
3. a splay tree

Details: You will be given 4 txt files. You are supposed to read those files and create a single tree (unbalanced search tree, AVL, Splay tree). The nodes of the tree are the words from the files. Next as the user inputs a word your job is to return a list of files that contain that word. (Your program should have implementation of all three methods for all three types of trees: insert, delete, find)

More details what needs to be done: you need to read the information from all 4 txt file and each file contains list of words (each word written from a new line). Once you read all txt files (you can discard the files) you need to extract the information and add it into your data structure. And then you should be able to do various operations on that data structure. The operations are:

find (outputs list of files that contain that word)
insert (inserts a word into the tree)
delete (deletes a word from the tree)
quit (ends the program)

Below you can see sample output

file1.txt

table
chair
box
apple

file2.txt

apple
bana
table

file3.txt

air
cat

file4.txt

computer
table

What would you like to do? > help

Your options are:

select (select the type of tree)

find

insert

delete

quit (ends the program)

What would you like to do?

> select

Type of tree?

> BST

What would you like to do?

> find

Word?

> table

1, 2, 4

What would you like to do?

> insert

Which file?

1,3,4

Word?

> rain

Insertion done!

What would you like to do?

> select

Type of tree?

> AVL

What would you like to do?

> delete

Word?

> table

Which file?

>1,4

Deletion done!

What would you like to do?

> delete

Word?

> table

Which file?

> 3

The word cannot be found!

What would you like to do?

> select

Type of tree?

> Splay

What would you like to do?

> find

Word?

> table

2

What would you like to do?

> insert

Which file?

2

Word?

> table

Insertion done!

(note: the word exists in the file #2 so no insertion is going to be done)

Your output should have the same format that see in about sample output example. No extra/fancy questions or operations are allowed.

Submission: You should submit all your files in Canvas. Be sure to read (and follow) the coding guidelines.

Cheating : You can discuss this project with other students. You can explain what needs to be done and give suggestions on how to do it. You cannot share source code. If two projects are submitted which show significant and troubling similarity in source code then both individuals will be punished.

What to Turn In

You should turn in the following electronically into canvas:

The files that make up your program.

A file status.txt that contains the following:

The status of your project (e.g. compiles or not, works correctly with producing all correct answers). A brief summary of how to operate your program. You should be sure to describe how to indicate the end of the input data.

A brief summary of the data structures and algorithms you finally used. In particular, you should give a summary of the major design decisions you have made in creating your data structure, and any major changes that were needed as your design evolved to create the final program. This needs not be long, but it should describe major decisions you made and any surprises you encountered that required changes as you developed the code.

In addition, if you worked with a partner,

- 1) only one partner needs to submit the code electronically.
- 2) Be sure that all partners' names are listed in all files.

3) Include in your status.txt file a description of how you developed and tested your code. If you divided it into pieces, describe that. If you worked on everything together, describe the actual process used – how long you talked about what, how long and in what order you wrote and tested the code. Be sure to describe at least one good thing and one bad thing about the process of working together.

You can work alone or in a group of 2 or 3.

As with all the previous projects submit a status.txt file where list the names of all the group members and the status of the project.