CS 2123-001 Data Structures

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Homework 5
Due date: check BB Learn
!!!! NO LATE HOMEWORK WILL BE ACCEPTED !!!

(Binary search trees)
In this assignment you are asked to write a simple driver program and set of functions (maybe in a library) that can be performed on a binary search tree. Your program should allow user to **insert/delete integer values** into the binary search tree along with several other operations on the binary search tree. *You can use the code given in slides. But this time your key will be int!*

Note: In this hw, you don't need to *worry about balancing, just do simple insertion/deletion.* But for practice, you may want to extend it with AVL balancing algorithm. But first make sure the basic ones work!

Specifically, your program will ask user to enter a command and related parameters (if any) in a loop, and then perform the given commands. Here is the list of commands that your program must implement:
* insert <a positive integer>
* find <a positive integer>
* delete <a positive integer>
* list inorder
* list preorder
* list postorder
* list levelorder
* max
* min
* height
* count
* sum
* quit

As always, make sure you release (free) the dynamically allocated memories if you allocate any memory in your programs. So, before submitting your program, run it with `valgrind` to see if there is any memory leakage…

What to return: !!!! NO LATE HOMEWORK WILL BE ACCEPTED !!!

1. Create a directory, say LASTNAME_hw5, and do all your work under that directory.
2. To compile the library (if any) and driver program, you must have a `Makefile` and use "`make.`"
4. After compiling, run your program a few times with different input values and save the output (using script) into `output.txt` file. So you will have around 3-4 files in your LASTNAME_hw5 directory.
5. Go to parent directory of LASTNAME_hw5, and use `tar -cf LASTNAME_hw5.tar LASTNAME_hw5`
   This will create a new file called LASTNAME_hw5.tar and it contains all of your files. So just submit this .tar file.
6. Go to BB Learn, and just submit LASTNAME_hw5.tar as **attachment** before the deadline. DO NOT submit other .h or .c files individually.

/* Don’t forget to include comments about the problem, yourself and each major step in your program! */

You must submit your work using Blackboard Learn and respect the following rules:

1) All assignments must be submitted as either a zip or tar archive file unless it is a single pdf file.
2) Assignments must include all source code.
3) Assignments must include an output.txt file which demonstrates the final test output run by the student.
4) If your assignment does not run/compile, the output.txt file should include an explanation of what was accomplished, what the error message was that prevented the student from finishing the assignment and what the student BELIEVES to be the underlying cause of the error.
