

Data Structures

Lab Exercise 9 (Binary Search Tree)

Task 1:

(Points 1)

Download `lab9_startercode.cpp` from NYU classes/Brightspace and complete following methods of BST (Binary Search Tree) class.

- a) `Node* getRoot ()` (0.1 Point)
A method which returns a pointer to the root of the Tree.
- b) `int height (Node *ptr)` (0.1 Point)
A method which finds the Height (Maximum Depth) of a tree/subtree rooted at `ptr`.
- c) `Node* findMin (Node *ptr)` (0.1 Point)
A method which finds and returns a pointer to the Node with minimum value of `key` in a tree/subtree rooted at `ptr`.
- d) `Node* findMax (Node *ptr)` (0.1 Point)
A method which finds and returns a pointer to the Node with maximum value of `key` in a tree/subtree rooted at `ptr`.
- e) `Node* findKey (Node *ptr, int key);` (0.1 Point)
A method which finds and returns a pointer to the Node with `key` value in a tree/subtree rooted at `ptr`.
- f) `void insert (Node* ptr, int key)` (0.2 Points)
A method which inserts a Node with `key` in a tree/subtree rooted at `ptr`.
- g) `Node* remove (Node *ptr, int key);` (0.2 Point)
A method which removes a node with `key` from the tree/subtree rooted at `ptr`.
- h) `void printInorder (Node* ptr)` (0.1 Point)
A method which traverses (in-order) and prints the `keys` of a tree/subtree rooted at `ptr`.

Code of Conduct

All assignments are graded, meaning we expect you to adhere to the academic integrity standards of NYU Abu Dhabi. To avoid any confusion regarding this, we will briefly state what is and isn't allowed when working on an assignment/lab-task.

Any documents and program code that you submit must be fully written by yourself. You can, of course, discuss your ideas with fellow students, as long as these discussions are restricted to general solution techniques. Put differently, these discussions should not be about concrete code you are writing, nor about specific results you wish to submit. When discussing an assignment with others, this should never lead to you possessing the complete or partial solution of others, regardless of whether the solution is in paper or digital form, and independent of who made the solution, meaning you are also not allowed to possess solutions by someone from a different year or course, by someone from another university, or code from the Internet, etc. This also implies

that there is never a valid reason to share your code with fellow students, and that there is no valid reason to publish your code online in any form.

Every student is responsible for the work they submit. If there is any doubt during the grading about whether a student created the assignment themselves (e.g. if the solution matches that of others), we reserve the option to let the student explain why this is the case. In case doubts remain, or we decide to directly escalate the issue, the suspected violations will be reported to the academic administration according to the policies of NYU Abu Dhabi.

(see <https://students.nyuad.nyu.edu/campus-life/community-standards/policies/academic-integrity/>)
