

COMP 314: Algorithms and Complexity

Lab work 3: Binary Search Tree

1 Purpose

Implementation and testing of binary search tree.

2 Tasks

Students are required to accomplish the following tasks preferably in Python.

1. Implement binary search tree. Your implementation must support the following operations:
 - (a) Add a node to a BST
 - (b) Search BST for the requested key
 - (c) Find the smallest key
 - (d) Find the largest key
 - (e) Delete a key from a BST
 - (f) Inorder traversal
 - (g) Preorder traversal
 - (h) Postorder traversal
2. Write some test cases to test each operation listed above.

Students are suggested to use GitLab to keep their programs. Naming convention for GitLab project: CE.III.(Roll_No)_Lab3

3 Readings

1. For binary search tree and algorithms:
 - Chapter 14 of Necaise, R. D. (2010). Data Structures and Algorithms Using Python.
 - Chapter 2 of Horowitz et al. (2013). Fundamentals of Computer Algorithms.
 - Chapter 12 of Cormen et al. (2014). Introduction to Algorithms.

2. For unit testings: <https://docs.python.org/2/library/unittest.html>
3. For Git: <http://www.vogella.com/tutorials/Git/article.html>