

## Data Structure, Spring 2020 Assignment #3

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### 1 Problem Statement

In this homework, you're going to implement a binary search tree by yourself. Your BSTree needs to have the following functions: *insert()*, *delete()*, *preorder()*, *inorder()*.

There are more detail descriptions for the functions.

*insert()*

The function follows the rule of standard binary search tree. The key in each node must be greater than any key stored in the left sub-tree, and less than any key stored in the right sub-tree.

*delete()*

The function remove a node which key equals to the input value. Please maintain the properties of binary search tree after doing *delete()* operation. If the given key value is not in the current tree, don't modify the tree.

*preorder()*

Print the current tree in the preorder traversal sequence. You should use space(' ') to separate the key of each node, and the output should end up with a newline character. The *\_\_repr\_\_()* function is defined in the node class, and DO NOT modify it.

*inorder()*

Print the current tree in the inorder traversal sequence. You should use space(' ') to separate the key of each node, and the output should end up with a newline character. The *\_\_repr\_\_()* function is defined in the node class, and DO NOT modify it.

## 2 Input/Output Specification

We have done the input function for you. You only need to focus on the *inorder()* and *perorder()*. The example format is in the output file. You can check your output format by run **python3 main.py**.

## 3 Evaluation

We have provided a code file **main.py**. You have to fill in the class **BSTree** which is used for testing. Write your codes in **TODO**.

1. Inorder traversal is useful while debugging.
2. Do not modify the interface of the functions, but you can add your own functions.
3. Binary search tree is not always balanced.

## 4 Submission

Please put your codes (including main.py or any other code files) into a directory named **studentID** and compress the directory into studentID.zip and upload studentID.zip to ceiba. The homework is due on **5/14**, at **4:00 am**.