Lab № 5

CSCI B505 Applied Algorithms 09/21/2022

Instructions

1. Please write the code for the problems in python language in Jupyter notebook
2. The code should readable with variables named meaningfully
3. Plagiarism is unacceptable and we have ways to find it. So do not do it.
4. Follow the instructions and define the methods/functions as given in the problem statement.
5. Write test cases wherever required so that they cover all scenarios.
6. Please do not use in-built python functions for solving the problem.

Problem 1

Build a binary Tree class with insert method. Insertion should happen in such a way that root node is always greater than the value of nodes in left sub-tree and is always lesser than values of nodes in right sub-tree.
write the inorder travesal function so that insertion step can be validated.
Note: All the elements will be distinct.

```
Example:

tree = Node(9)

tree.insert(6)
tree.insert(4)

tree.print()
      9
     /
    6
   /
  4
```

```
prints ->  4 6 9


tree.insert(4)
tree.insert(5)

        9
      /   \
     6    10
    /       \
   4        12


tree.print()

prints -> 4 6 9 10 12
```

Write the code as below building the binary tree.

```
1
2  class Node:
3      def __init__(self, value):
4          ####################
5          Your Logic here
6          ####################
7
8      def insert(self, value):
9          ####################
10         Your Logic here
11         ####################
12
13     def in_order_traversal(self):
14         ####################
15         Your Logic here
16         ####################
17
18     def print(self):
19         self.in_order_traversal()
```