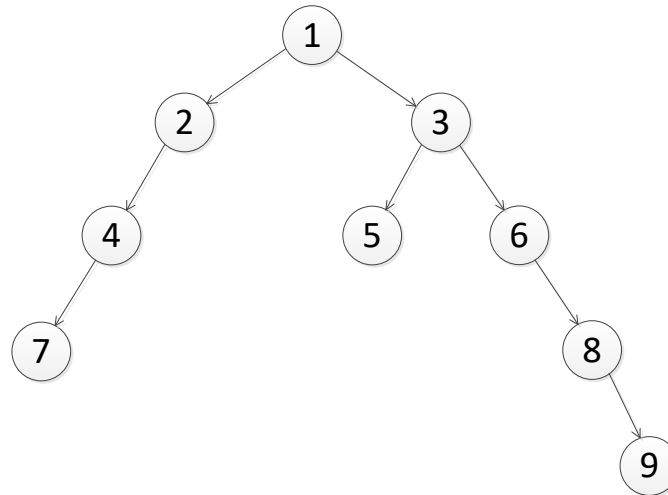


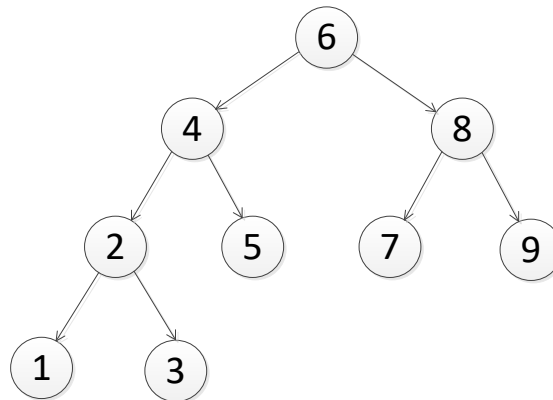
Homework #6

In this assignment you are asked to implement a variety of methods that operate on binary trees (the binary tree implementation from the lecture notes). You will be asked to test these methods on the following two trees:

Tree #1



Tree #2



For parts a through g, implement the given method and demonstrate the method working with the two trees provided earlier.

All code implemented in this assignment should be in a class called `Homework6`. You may use the data structures and algorithm code from the lecture notes.

Hint: Consider using recursion. To do so implement a private helper method that takes a `Node` and then recursively calls itself to traverse the tree. The public method would call the private method passing the tree's root as the `Node`.

a) **(1 point)** `public static int countLeaves(BinaryTree tree)`

Returns the number of leaf nodes in the tree.

b) **(1 point)** `public static int countNonLeaves(BinaryTree tree)`

Returns the number of non-leaf nodes in the tree.

c) **(1 points)** `public static int getHeight(BinaryTree tree)`

Returns the height of the tree.

d) **(1 point)** `public static void printPreOrder(BinaryTree tree)`

Prints the elements of the tree using a pre-order traversal.

e) **(1 point)** `public static void printInOrder(BinaryTree tree)`

Prints the elements of the tree using an in-order traversal.

f) **(1 point)** `public static void printInOrder(BinaryTree tree)`

Prints the elements of the tree using a post-order traversal.

g) **(3 points)** `public static void removeLeaves(BinaryTree tree)`

Removes all leaf nodes from the tree. Use `printPreOrder`, `printInOrder`, or `printPostOrder` after calling `removeLeaves` to show that `removeLeaves` successfully removed all leaves.

h) **(1 point)** Make sure your source code is well-commented, consistently formatted, uses no magic numbers/values, and follows programming best-practices.

Turn in all source code, program output, diagrams, and answers to questions in a single PDF document.