

## Lab 5 – Binary Tree

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### Instructions:

- You are expected to completed Problems 1 - 3 before attending the lab.
- Please submit the hardcopy of your program by the end of the lab.

### 1. Your tasks

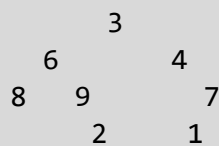
The initial code for this lab provide you a skeleton to implement the following functions. Your tasks are to complete these functions to make them work.

#### Problem 1.

Complete `bool` `countTwoChildrenNodes()` method in class `BinaryTree` that returns the number of nodes with two children. *You are allowed to write another supported (recursive) method to complete this problem.*

#### Example

Problem 01



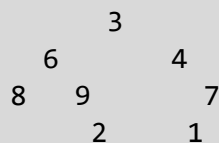
The number of nodes with two children: 2

#### Problem 2.

Complete `void` `printBreadthFirstSearch()` method in the class `BinaryTree` that print out all the node in breadth first search order.

#### Example:

Problem 02



The breadth first search traversal: 3 6 4 8 9 7 2 1

#### Problem 3.

Complete `bool` `isBST()` method in the class `BinaryTree` that return whether the tree is binary search tree or not. *You are allowed to write another supported (recursive) method to complete this problem.*

Example:

Problem 03

```
      3
     / \
    6   4
   / \ / \
  8  9 7   1
     \ / \
      2  1
```

Tree 1 is BST: 0

```
      3
     / \
    2   6
   / \ / \
  1  4 8   9
     \ / \
      7  9
```

Tree 2 is BST: 1

**Problem 4.** *(to be released in the lab)*