## Assignment 6 – Graphs and Trees

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**1. How many ancestors does a node at level n in a binary tree have? Provide justification.**

**2. Prove that a strictly binary tree (regular binary tree) with n leaves contains 2n-1 nodes. Provide justification.**

**3. Explain in detail that if m pointer fields are set aside in each node of a general m-ary tree to point to a maximum of m child nodes, and if the number of nodes in the tree is n, the number of null child pointer fields is n*(m-1)+1.**

**4. Implement maketree, setleft, and setright for right in-threaded binary trees using the sequential array representation.**

**5. Implement inorder traversal for the right in-thread tree in the previous problem.**

**6. Define the Fibonacci binary tree of order n as follows: If n=0 or n=1, the tree consists of a single node. If n>1, the tree consists of a root, with the Fibonacci tree of order n-1 as the left subtree and the Fibonacci tree of order n-2 as the right subtree. Write a method that builds a Fibonacci binary tree of order n and returns a pointer to it.**

**7. Answer the following questions about Fibonacci binary tree defined in the previous problem.**

**a) Is such a tree strictly binary?**
**b) What is the number of leaves in the Fibonacci tree of order n?**
**c) What is the depth of the Fibonacci tree of order n?**