Trees and Graphs

(For the below tasks, you may want to create a binary tree manually and use the same tree for all of these tasks. However, for task 6, you need two trees; hence, prepare another)

**NB: All the methods(1-7) as well as the main method/tester statements must be written in one class. DO NOT write a different class for each method.**

**Compile all your codes and simulation picture in ONE PDF and submit it .**

1. **RECURSIVELY** calculate the height of a tree.
2. **RECURSIVELY** calculate the level of a Node in a tree.
3. Print elements of all the Nodes of a tree using **Pre-order Traversal**.
4. Print elements of all the Nodes of a tree using **In-order Traversal**.
5. Print elements of all the Nodes of a tree using **Post-order Traversal**.
6. Write a method which will evaluate whether two trees are **exactly same** or **not**.
7. Write a method which will return a **copy (new tree) of a given tree**.
8. An adjacency matrix is given below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| **A** | **0** | **1** | **0** | **1** | **1** | **0** | **0** |
| **B** | **0** | **0** | **0** | **0** | **0** | **0** | **1** |
| **C** | **0** | **1** | **0** | **0** | **0** | **0** | **0** |
| **D** | **0** | **0** | **1** | **0** | **0** | **0** | **1** |
| **E** | **0** | **0** | **0** | **0** | **0** | **0** | **0** |
| **F** | **0** | **0** | **0** | **1** | **0** | **0** | **0** |
| **G** | **0** | **0** | **0** | **0** | **1** | **1** | **0** |

1. Draw the equivalent graph.