SIT221 –DATA STRUCTURES AND ALGORITHMS

LAB10: TRAVERSING TREES

LAB OBJECTIVE:

The objective of this lab is to develop your skills in solving tree & graph based problems

SUBMISSION INSTRUCTIONS

Please submit your work to Week10 assignment folder

PREPARATION

1. Download the template project available in week10 resources folder. The solution has two projects: **DataStructures_Algorithms & Runner** projects.
2. Check the QuickGraph library here: https://quickgraph.codeplex.com/documentation

LAB TASKS

TRAVERSING BINARY SEARCH TREES

In this task we want to extend the **BinarySearchTree** class implemented in week 8 to support Breadth First Search (BFS) and Depth First Search (DFS).

1. We do not want to copy the **BinarySearchTree** class in week08 again into this week's folder, but still want to extend it. How to do so? You can do so by using **partial classes** – a very useful concept in C# that enables splitting your class over multiple files with so many useful applications including code generation - more benefits: http://stackoverflow.com/questions/3601901/why-use-partial-classes
2. Modify the **BinarySearchTree** class in week08 by adding **partial** keyword to it – it should look like: **public partial class BinarySearchTree<T>**
3. Now add a new class into your week10 project. Call it – **BinarySearchTree** and modify its declaration to be a partial class. You will have two identical class declarations (one in week08 & the other in week10) and both declarations have **partial** keyword
4. In week10 file implement the following methods:
    a. **public void BFS**(TextWriter tw) – This method should traverse tree nodes from the root node until the leaf nodes level by level. See lecture slides for steps & instructions in the class template given.

b. **public void DFS(**TextWriter tw**) –** This method should traverse tree nodes from the root node going depth first. See lecture slides for steps & instruction in the class template.

5. Test your implementation using the supplied Runner class (**Runner10_Task1.cs**)