**COMP-254** Data Structures and Algorithms

**Hands-On TEST-2**

**Be sure to read the following general instructions carefully:**

* This test **must be completed individually** by all the students **using Java**.
* Read the project naming and submission guidelines.

**Exercise 1**

The **path length** of a tree T is the sum of the depths of all positions in T. In the existing class **LinkedBinaryTree**, provide a non-static method named ***pathLength*** that computes the path length of a tree T. Write the testing code in the *main* method of the class **LinkedBinaryTree**. You must use and update the relevant classes provided in **Lesson8Examples** posted in the **eCentennial** module “**Lesson Examples (from textbook)**”.

(5 marks)

**Exercise 2**

In the existing class **UnsortedTableMap**, the method ***put(k,v)*** is used to add an entry to a map. This method spends time to locate an existing item with the given key. Provide a non-static methodnamed ***putOnlyIfAbsent*(*k,v*)** that adds the entry to the map *only if* there is no entry with a key ***k***. In case an entry with key ***k*** already exists, then just return the existing value corresponding to the key. The new method should be provided in the class **UnsortedTableMap**. Write the testing code in the *main* method of the class **UnsortedTableMap**. You must use and update the relevant classes provided in **Lesson10Examples** posted in the **eCentennial** module “**Lesson Examples (from textbook)**”.

(5 marks)

**Submission guidelines:**

You must name your **Eclipse project** according to the following rule:

**YourFullname\_COMP254\_Test2**.

Example: **JohnSmith\_COMP254\_Test2**

**Create a java package for each exercise (for example, ex1, ex2, …).**

**Submission rules:**

Compress the above Eclipse project according to the following rule:

**YourFullname\_COMP254\_Test2.zip**

Example: **JohnSmith\_COMP254\_Test2.zip**