COMP 2231_SW3 - Data Structures and Algorithms (Fall 2020 Carruthers)

Assignment 4: Trees & Binary Search Trees (8%)

According to our suggested 13 week course schedule, this programming project should be completed and submitted by the Monday of Week 11. It is worth 8% of your final grade. Please refer to the "Assignments Overview" for details on the marking rubric and submission of work.

1. Complete the implementation of a `DecisionTree`, introduced in Chapter 19. This will require completing a number of methods from the source code for this chapter, particularly for `LinkedBinaryTree`. Your initial test should be the `BackPainAnalyzer` output from Listing 19.6 on page 746. Show test cases for at least two other correct traversals of this tree.

   Develop and demonstrate another decision tree that is more complex the BackPainAnalyzer tree. Provide at least two correct traversals of this tree, as well.

2. **PP 20.5 (page 801)**

   Complete all missing methods in `LinkedBinarySearchTree`. Show test cases for all implemented methods being sure to include edge cases for methods where applicable.

   Then, implement a balance tree method for this class using the brute force method described in Section 20.5 of your textbook.

   Show test cases for two different degenerate trees, outputting the height of the tree before and after balancing the tree. Then, demonstrate insertions into a balanced tree that result in degenerate trees and rebalance the tree again.

Hint: Copy the elements into an `ArrayList` using an in-order traversal. Recursively build a balanced tree using a binary partitioning.

Criteria	Weighting
Correctness of solution: Algorithm is implemented and produces correct results for the stated problem.	/4
Testing: Submission of test exhibits to indicate the solution works for a range of cases (e.g., minimum and maximum inputs) and handles unexpected exceptions.	/2
Comments and documentation: Source code contains comments that explain in plain English what the code is intended to do. **Note:** Javadoc style is not required.	/2
Total	/8

Submission status

Attempt number	This is attempt 1.
Submission status	No attempt
Grading status	Not graded
Last modified	-
Submission comments	Comments (0)

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You have not made a submission yet.

◀ Assignment 3: Lists & Iterators (8%)

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Assignment 5: Heaps and Priority Queues, Graphs, & Hashing (8%) ▶

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