

Loyola University Chicago
Department of Computer Science
COMP 272: Data Structures II (Spring 2024)

Assignment # 4

This is an individual assignment.

Deadline: **Thursday, February 29th, 2024, 11:55PM.**

You need to submit your solutions in Repl.it.

Binary Search Tree (25 points)

Implement the following method:

- **traverseByLevel**

Complete the *traverseByLevel()* method. This method should return a string of integers representing the traversal of the tree in level-order (or breadth-first order).

Hash Map (25 points)

Implement the following method:

- **getAverage**

Complete the *getAverage()* method. This method should accept two arguments, HashMap and arr, where arr is an array of integers. The method then returns a computed average of the values of each key found in both the array and HashMap. For example, the keys 1, 2 from the array are present in the HashMap, so the average is calculated as $(10+20)/2 = 15$. The keys '7' and '8' are not present in the HashMap, so their corresponding values are not included in the average calculation.

- **odd**

Complete the *odd()* method. This method should return an ArrayList with values of the corresponding odd keys.

Hash Map – Separate Chaining Implementation (50 points)

Complete the methods *replace(K, V, V)*, *containsValue(V)*, and *containsKey(K)*. Full documentation is provided in main.java file located on Repl.it.

Submission:

- 1) Before submission, make sure your code passes all the JUnit tests. Keep in mind, however, that passing the test cases does not guarantee that your code is correct or efficient. Your assignment will be graded considering test results, correctness, and efficiency.
- 2) The submission should be completed in Repl.it.
- 3) Include your name and class number as comments at the top of each submitted Java file.