ASSIGNMENT 3

Assignment 3 tests your knowledge of trees (Chapters 25 and 26), hashing structures (Chapter 27) and graphs (Chapters 28 and 29). You can and should start with the examples from the textbook/presentation and adapt them to the assignment at hand and use the appropriate names and requirements bellow.

Design a **program/project/driver class YourNameAssignment3** [1] and the following **classes** (with exact[2] names, replace **YourName** with your actual name or the name you go by, no spaces):

Class Exact Name	Description
YourNameBinarySearchTree	The complete version of user-defined binary search tree BST class from Chapter 25.
YourNameAVLTree	The complete version of the user-defined self-balancing binary search tree AVLTree class from Chapter 26 that uses YourNameBinarySearchTree instead of the BTS.
YourNameMap	The complete version of the user-defined MyMap from Chapter 27.
YourNameHashMap	The complete version of the user-defined MyHashMap from Chapter 27 that uses the YourNameMap instead of the MyMap.
YourNameHashSet	The complete version of the user-defined MyHashSet from Chapter 27
YourNameGraph	The complete version of the user-defined Graph from Chapter 28.
YourNameUnweightedGraph	The complete version of the user-defined WeightedGraph from Chapter 29 that uses the YourNameGraph instead of the Graph.
YourNameWeightedGraph	The complete version of the user-defined UnweightedGraph from Chapter 29 that uses the YourNameUnweightedGraph instead of the UnweightedGraph.
YourNameAssignment3	The driver class main method processes the **Assignment3Data.txt** file (line format is: "**City1 City2 Distance**" separated by tabs; representing the distance between City 1 and City2 and City2 and City1) and build instances of the classes above as requested bellow: ▪ Read the Distance part of the Assignment3Data.txt file and build instances of the user-defined **YourNameBinarySearchTree** and **YourNameAVLTree** above called **MyYourNameBST** and **MyYourNameAVLT** and test/demonstrate ALL functionality/methods for both (meaning it will call all methods to show that they work correctly). ▪ Read the City1 part of the Assignment3Data.txt file and build an instance of the user-defined **YourNameHashSet** class above called **MyYourNameHS** and test/demonstrate ALL functionality/methods for it. ▪ Read the City2 and Distance part of the Assignment3Data.txt file and build an instance of the user-defined **YourNameHashMap** class above called **MyYourNameHM** and test/demonstrate ALL functionality/methods for it. ▪ Read the City1, City2, and Distance from the Assignment3Data.txt file and build instance of the user-defined **YourNameWeightedGraph** class above called **MyYourNameWG** and test/demonstrate ALL functionality/methods for it. You can optimize this method and build all the structures in one reading of the file.

I do ask for exact names and exact/precise spelling of the classes and instances (that include your actual name in them) to show me that you understood and wrote the classes and methods, and you did not just type, or copied and pasted them from somewhere. Thus, if you do not name them accordingly and your actual name is not in the name of classes and instances, you are not going to earn credit for them.

Create a Microsoft Word **screenshots document** called YourNameAssignment3-Screenshot.docx (replace YourName with your actual name) that contains screenshots of the entire JAVA source code files in the editor window for each one the classes and the entire output (from the driver class). If the entire class JAVA source code or the output does not fit in one screenshot, create multiple screenshots, and add them to the document. Please add the screenshots in order, to make reading and understanding your work easier and earn full credit for your work.

Submit the following 10 exact files: **YourNameAssignment3.java**, **YourNameBinarySearchTree.java**, **YourNameAVLTree.java**, **YourNameMap.java**, **YourNameHashMap.java**, **YourNameHashSet.java**, **YourNameGraph.java**, **YourNameUnweightedGraph.java,** and **YourNameWeightedGraph.java**, Java source code files and **YourNameAssignment3-Screenshots.docx** screenshots document on eCampus under **Assignment 3.** Do not archive the files (no ZIP, RAR, etc.) or submit other file formats (no CLASS, TXT, DOCX, PDF, or any other format of the requested files). You are not going to earn credit if the files are not named as requested.

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[1] Replace **YourName** with your actual name or the name you go by, no spaces (e.g., if I were a student, I would use AdrianaBadulescu)

[2] Use the exact names (spelling, caps). Yes, you may find examples in the textbook with different names and cases and with other methods, but you will need to adapt them to have this exact names and cases, to earn any credit for the assignment. You are not going to earn any credit if the classes and instances' names do not contain your actual name.