CMPSCI 182L Data Structures and Program Design Lab

Project 5 – Binary Search Trees (30 points)

Due 5/13/21

Write a program that provides a way for you to store and retrieve telephone numbers. This "phone book" will store names and numbers in a binary search tree. Design a console program that provides the following operations:

Add: Adds a person's name and phone number to the phone book.

Delete: Deletes a given person's name and phone number from the phone book, given only the name.

Find: Locates a person's phone number, given only the person's name.

Change: Changes a person's phone number, given the person's name and new phone number.

Quit: Quits the application, after first saving the phone book in a text file.

You can proceed as follows:

- Design and implement the class ***Person***, which represents the name and phone number of a person. You will store instances of this class in the phone book.
- Design and implement the class ***PhoneBook***, which represents the phone book. The class should contain a binary search tree as a data field. This binary search tree contains the people in the book and the **PhoneBook** class should contain all of the methods which "operate" the binary search tree.
- Add methods to the **PhoneBook** class that use a text file to save and restore the tree.
- Design and implement the class ***Menu***, which provides the program's user interface. This class contains a main method which displays a menu for the user, declares an object from the **PhoneBook** class, then invokes the Add, Delete, Find, Change or Quit methods on that **PhoneBook** object, depending on the menu choice the user has made. For example, if the user chooses option A to add a name and number to the phone book, the program should prompt the user for both the name and number, then invoke the add method on the **PhoneBook** object, passing the user-entered name and number to the add method.

The program should read data from a text file when it begins and save data into the text file when the user quits the program.