Northern Michigan University (Marquette Co, MI)
CS 222-61-20W: Data Structures

Program 4
Due: Wednesday 31 March 2021 10:00 A.M. EDT

Student Database

Make a directory called “PG4” in the root of your CS222-61-20W folder. Place all the source code and include files in this directory. Place a (possibly empty) file called “DONE” into this folder when you are ready for your program to be graded.

You are to create a database program that keeps track of books in a library. The key field is the name of the student. The data field is a double containing the student's average (from 0.0 to 100.0).
Your program should read all commands from the keyboard and print all responses to the screen.

The commands are:

ADD "Student" GPA

This adds the student to the database with the designated GPA. It is an error if the student already exists.

PRINT

This will print all students and grades, in alphabetical order.

RPRINT

This will print all students, in reverse alphabetical order.

REMOVE "Student"

Removes the student and the associated GPA from the database. It is an error if the student does not exist.

LOOKUP "Student Name"

Prints the student name and the GPA from the database. If the student does not exist, the program should print the names in the database that the given student would fall between.

EDIT "Student Name" GPA

Changes the GPA of the student to the designated one, printing to the screen the old GPA as well as the new one. It is an error if the student does not exist.

EXIT

The program terminates.

You may trust that invalid commands will NEVER be entered.

Your program should give a meaningful response to EVERY valid command.

Like all projects in this class, once the proper data structure is set up, the rest of the program should be reasonably straightforward.

You are to use a binary tree (as defined in class) using the Database class as defined in class.