CSCI 241 Data Structures
Programming Assignment: Extra Credit
Electronic Turn-in due: 10pm, Friday Dec 2nd, 2016.

In this assignment, you will write a program that analyzes a set of five data files (.txt files) containing baby names. For each year of birth, the comma-delimited file called yobYYYY.txt contains baby name records. Each record uses the format "name, gender, frequency," where name is 2 to 15 characters, gender is M (male) or F (female) and "frequency" is the number of occurrences of the name. Each file is sorted first on gender and then on frequency in descending order. When there is a tie on the frequency, names are listed in alphabetical order.

Your program must use binary search tree or its variants to store the names. Your program must contain the following method:

- **TrendyNames** returns the most popular 10 female and male baby names for all five years and display how their popularity changed over the years. To show that, for each year you show the top 10 names with their frequency and %. If some names appear for one year and not others, that's okay.
    - In addition, you will also print an overall list of TendyNames where you combine the frequencies of names for the five years and then produce the list.
    - You will print how the ranks of these names have changed over time.
    - You will also print how much popularity these names have gained (or lost).

Development and Testing

Five .txt files will be available to you representing information about baby names and numbers, one for each year.

Output for TrendyName can be displayed in the following manner:

Year F-1 F-2 F-3 F-4

2014 Emma, 20799, 10% Olivia, 19674, 9.9% Sophia, 18490, 9% Isabella,16950, 7.3% ……

2013 Sophia, 21147, 11.5% Emma,20876,10% Olivia,18366,8% Isabella,17573,7% ……

Points

This assignment will be scored by taking the points earned and subtracting any deductions. You can earn up to 10 points:

Component	Points
TrendyNames	8
Write-up and Test Cases	2

Submitting Your Work

By 10 PM on the due date, you should submit **all your files (everything that is required to compile and run your program)** and the following materials

1. Your write-up
2. Your test files (at least two different test files)

While evaluating, we will compile all .java files, run it against a series of test cases, analyze your code, and read your write up.

Write-Up & Test Cases

In one or two pages, provide a write-up of your implementation. Please submit your write-up as a plaintext file named writeup.txt. Your write-up should include the following points:

1. Your name
2. An acknowledgement and discussion of any parts of the program that are not working. Failure to disclose obvious problems will result in additional penalties.
3. An acknowledgment and discussion of any parts of the program that appear to be inefficient (in either time or space complexity).
4. A discussion of the portions of the assignment that were most challenging. What about those portions was challenging?
5. A discussion on how you approached testing that your program was correct and asymptotically efficient. What did test1.txt test? What did test2.txt test?

Academic Honesty

To remind you: you must not share code with anyone. You can use code produced by your group for Assignment 3. You must not look at others' code or show your classmates your code. You cannot take, in part or in whole, any code from any outside source, including the internet, nor can you post your code to it. If you need help from other students, all involved should step away from the computer and discuss strategies and approaches, not code specifics. I am also available via email (do not wait until the last minute to email). If you participate in academic dishonesty, you will fail the course.