**Programming Project Report**

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**Academic Integrity Statement:** I pledge that I have neither given nor received unauthorized help on this programming assignment.

**Problem Statement:**

The goal of this programming assignment is to use binary search trees to look up names and determine their popularity. This program takes in 1000 names from a file called “last.txt” this also takes an input from the user asking which name to look up. This program outputs the how many people have that last name, what percentage of people have that last name, and what rank that last name is compared to other last name.

**Design:**

I decided to use binary search trees because that is what we were told to use. This program uses while loops, nodes, and binary search algorithms. The pros of using these is that binary search trees are an ON(logN) algorithm, meaning it is very fast. The cons of using this algorithm is that I have never used it before and had to figure it out.

**Implementation:**

I started with professor Gauch’s tree.cpp and tree.h sample code. I extended this code by making it work for strings instead of integers. I also added more values to the Nodes, rather than just “value” it contained “name”, “count”, “percent”, and “rank”. I did the midpoint a week before the rest of the project.

**Testing:**

I tested my program by using my own last name and the last name of people I know. The normal cases I used were “Taylor”, “John”, and “William” (My first, middle, and last name).

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Description automatically generated

Some special cases I tested were numbers, my last name with a lower case first letter, and random words.

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Description automatically generated

My code acted as I expected. It simply said that the word wasn’t one of the top 1000 most popular last names.

**Conclusions:**

The overall success of this project was a success. I wouldn’t change anything if I had to do this project again. This project took about 2 hours to complete, including this report.