Alex Jarratt

Professor Amy Burns

CS 300

DSA: Analysis and Design

February 25, 2022

Project One Run-Time Analysis

I did a best estimate on my pseudocode for a run-time evaluation for each of the three differing pseudocode data storage types. Unsurprisingly, vector came up with the smallest at 19+3n, where n is meant as a way of saying how many times was the file length used. This might seem big, but this does include my error check as well which does modify my numbers a bit. Hash table came next with 54+3n. A lot more front heavy code but from what the assignment that module was working with it felt more structured and presentable. Finally tree came in with 62+4n. It gained another n because it also used the search function that was asked for by the milestone which really did not help the already quite large 62 lines. Immediately, the advantages and disadvantages come to mind. With vectors as the structure it is easily much more faster than the other methods. It’s simply going to run faster because there is less code needed to set up the structure. With hash table the table has to be created while vector sorting simply stores it. With tree storage it is created from the ground up leaving a lot of potential errors to be made as well as needing to have a better understanding of these storage structures. Vector sorting takes less of a knowledge base to make it operate in comparison to both hash tables and trees. These are all effective for specific situations but it is clear that vector sorting is easily implemented, takes less code to do so, and is easier to understand than the other methods. Hash tables are better structured for multiple aspects of each item in the list as it will present that better than vector storage. Tree storage gives the most power to the programmer by virtue of there being so many necessary steps to make a function tree storage system. For my recommendation it would have to be vector storage. The ease of use vector has as well as the easiest implementation of the storage types makes it the clear choice for my uses. It might not look the greatest and it might not be as capable as the others in some situations but vector storage will work well enough. Its faster by virtue of the ‘Big O’ analysis and my own found advantages.