Enhancement Two:

The artifact I created is a program that reads a CSV file into a binary search tree to allow the organization of college classes.. This artifact was originally created in the spring of 2024. This project was included in my ePortfolio because it deals with search which is ever more important as companies like Google focus on improving their search divisions. The same approach used to improve search times here leads to better search times and lower complexity on those projects. Therefore, showcasing an ability to improve search metrics and understand the tradeoffs that a faster search may have, are critical to a well founded portfolio. In my improvement of the artifact, I was able to cut search times from 2.691 and 2.19 seconds to 1.368 and 1.284 seconds respectively. While this is not a large amount of raw time due to the small nature of the list, it is roughly a 50% reduction in time taken to search, albeit at the cost of accuracy. It would struggle to return an accurate result if two courses share the same number, however, this is an acceptable tradeoff for its speed as the program will not error out. Instead, it would only return one of the possible courses and then prompt again. I believe that I have met part of the outcome I would like to achieve with data structures and algorithms, however, I want to continue testing these improvements and find better ways to improve search speed while maintaining accurate results. One thing I learned while working on this artifact was how difficult it is to remove specifically alpha characters from a string. I was hoping to use regex like c#, however, there is no support as far as I could tell. There were several convoluted solutions, but due to the static nature of the prefixes I was instead able to trim the beginning of each string. I may try converting the course number string to an integer and see how that affects the search time as well.

Enhancement List:

* Refined and added additional comments
* Added additional search method, quick search
* Added additional course variable, course number
* Modified data input to procure course number from CSV
* Added additional output text to show quick search

Instructions for Testing:

1. Open the Project Two Solution file in Visual Studio
2. Compile and run the CS 300 Project Two.cpp file
3. When prompted, press 1 to load a CSV file
4. Enter “ABCU.csv” and press enter. Alternatively, you can use any CSV file in the project directory, but it must be formatted as Course Code, Course Name, Prerequisite Course Codes per line
5. Press 2 to print all courses
6. Press 3 and type in a full course code (i.e. MATH201) and the program will return the course, prerequisites, and time taken
7. Press 4 and type in a course number (i.e. 201) and the program will return the course, prerequisites, and time taken
8. The time taken by process 4, the quick search, should be significantly lower than the course code search as seen below:

A screenshot of a computer program

Description automatically generatedA screenshot of a computer program

Description automatically generated