The ABCU Project.cpp file is a C++ program that models a simple advising system using a binary search tree (BST). It loads course data from a file, stores it in a tree structure, and allows users to print course lists or look up specific course details, including prerequisites. I selected this artifact because it demonstrates my understanding of tree data structures, file handling, and user interaction. Although it functioned well originally, I identified opportunities to refine its efficiency, clarity, and correctness.

For my enhancement, I first addressed an issue in the validatePrerequisites() method, which did not correctly search the entire BST. I rewrote the logic to ensure it traverses the full tree and properly checks for each prerequisite. I also improved file parsing using a safer and cleaner std:string stream approach. Additionally, I removed the unnecessary use of dynamic memory, replacing it with a stack-allocated object to avoid potential memory leaks. The user interface was cleaned up with more readable prompts, and I added input validation to guide users and prevent crashes.

These enhancements reflect my growth in algorithmic thinking, software structure, and secure coding practices. The improved code is easier to read, more stable, and more maintainable, which aligns with professional software engineering standards. This artifact now better demonstrates my capabilities in both algorithms and software design, making it a strong addition to my portfolio.