**Teisha Yoder**   
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**Journal Entry**

As I reflect on my progress through the Computer Science program, I recognize that my career plans have remained consistent, yet my understanding and focus have deepened. From the beginning, I was drawn to software development with an emphasis on data management and backend programming. That path continues to feel aligned with my strengths and interests, particularly because I enjoy working with Python, databases, and systems integration. Over time, my perspective has expanded beyond writing code in isolation to appreciating the broader impact of software engineering, including scalability, maintainability, and strong database design as essential for real-world applications.

My career thinking has matured from the simple goal of “becoming a programmer” to envisioning a role where I can contribute to end to end software solutions that are efficient, secure, and user friendly. Research into career trends and roles within software engineering, full stack development, and database administration confirmed that backend specialization, database expertise, and cloud focused skills are in high demand (Bureau of Labor Statistics, 2025). This research has also encouraged me to consider professional certifications, such as AWS or database administration credentials, as a way to strengthen my marketability (Amazon Web Services, n.d.). While I may pursue a master’s degree in the future, my immediate plan is to build professional experience and continue advancing technical skills that connect directly to industry needs.

Throughout the program, I have met several key outcomes, including applying problem solving techniques, implementing algorithms, developing data structures, and creating functional database driven applications. I have also grown stronger in documenting and refining software artifacts. Outcomes I am still pursuing involve elevating the clarity of project documentation and ensuring each artifact for my portfolio demonstrates industry quality standards. These remaining goals will serve as a capstone to my program and set a practical foundation for my transition into the workplace.

**Algorithms and Data Structure Enhancement Narrative**

The artifact I selected is my Data Structures Project, originally created in the CS-300 course a few semesters back. This project implements fundamental data structures such as linked lists, stacks, and hash tables, alongside core algorithms like searching and sorting. Its purpose is to demonstrate foundational programming skills and algorithmic logic in handling data efficiently.

I chose this artifact for my ePortfolio because it clearly showcases essential competencies in algorithms and data structures, which are central to my development as a computer science professional. The project highlights my ability to both design and refine algorithms with a focus on improving their efficiency. The enhancements, including integrating binary search algorithms, hash based lookups, and memoization, demonstrate my growth in optimizing both time and space complexity, key skills in algorithmic problem solving. These improvements not only advanced the project’s performance but also provided practical experience applying theoretical concepts to real world coding challenges.

This enhancement allowed me to meet key course outcomes related to designing computing solutions using sound algorithmic principles and managing trade offs in design choices. It demonstrated my ability to implement innovative techniques and optimize data structures effectively, reflecting substantial progress toward achieving program level competencies. For future work, I plan to continue deepening my expertise by exploring more complex algorithms and improving the clarity and comprehensiveness of my technical documentation to enhance professional communication.

The process of enhancing this artifact offered valuable lessons in balancing optimization with code maintainability and clarity. A significant challenge was determining which sections of the code would respond best to improvements without introducing unnecessary complexity. This experience sharpened my understanding of trade offs between algorithmic efficiency and readability. Additionally, the task enhanced my skills in debugging and profiling code to measure improvements objectively. Documenting these enhancements also improved my ability to communicate technical changes clearly, which is critical for collaborative software development and professional growth.

**References**

Amazon Web Services. (n.d.). *AWS certification*. Retrieved from <https://aws.amazon.com/certification/>

Bureau of Labor Statistics. (2025). *Software developers: Occupational outlook handbook*. U.S. Department of Labor. Retrieved from <https://www.bls.gov/ooh/computer-and-information-technology/software-developers.htm>