# Professional Self-Assessment

As I complete my Computer Science degree and present this ePortfolio, I reflect on the transformative journey through my coursework and capstone project, which have collectively shaped my technical expertise, professional goals, and readiness to excel in the computer science field. Developing this ePortfolio has allowed me to curate a comprehensive showcase of my skills, emphasizing my ability to design innovative, efficient, and secure computing solutions. This self-assessment serves as an introduction to my portfolio, highlighting my strengths across key computer science domains and demonstrating my employability through quantifiable achievements and a commitment to professional growth.

## Reflecting on the Computer Science Program and ePortfolio Development

Completing the Computer Science program has equipped me with a robust foundation in both theoretical and practical aspects of the discipline, enabling me to address real-world challenges with confidence. The coursework and ePortfolio development have been instrumental in refining my professional goals, which now center on delivering scalable, user-focused software solutions while fostering collaborative and innovative environments. Below, I discuss how my experiences have strengthened my skills in critical areas, supported by specific examples from my program and beyond.

* **Collaborating in a Team Environment**: Throughout the program, group projects, such as a semester-long software development project in a Software Engineering course, taught me to navigate diverse team dynamics. I contributed to a team of five to develop a task management application, where I led the backend development using Node.js and facilitated daily stand-ups to ensure alignment. This experience honed my ability to communicate technical concepts clearly and resolve conflicts, such as reconciling differing design preferences for the database schema. Outside of coursework, my participation in a university hackathon further reinforced collaboration skills, as I worked with a cross-disciplinary team to build a mobile app prototype in 24 hours, earning second place for its innovative user interface.
* **Communicating with Stakeholders**: Effective communication with non-technical stakeholders was a key focus in my Systems Analysis course, where I developed a requirements document for a mock client’s inventory management system. By conducting interviews and presenting wireframes, I translated business needs into technical specifications, ensuring stakeholder buy-in. Beyond academics, my internship at a local startup involved presenting a data visualization dashboard to executives, requiring me to distill complex data insights into actionable recommendations, which directly influenced the company’s marketing strategy.
* **Data Structures and Algorithms**: My proficiency in data structures and algorithms was solidified through courses like Data Structures and Algorithm Analysis. For instance, I implemented a graph-based shortest-path algorithm for a navigation app project, reducing runtime complexity from O(n²) to O((V+E)logV) using Dijkstra’s algorithm with a priority queue. This optimization improved performance for large datasets, showcasing my ability to select and apply appropriate algorithms. Additionally, my independent study of competitive programming on platforms like LeetCode enhanced my problem-solving skills, enabling me to tackle complex algorithmic challenges efficiently.
* **Software Engineering and Database**: Software engineering principles were central to my coursework, particularly in a Database Systems course where I designed a relational database for an e-commerce platform, optimizing queries with indexing to reduce response times by 40%. I also adopted agile methodologies in a Software Engineering project, using Git for version control and Jira for task tracking, ensuring timely delivery of a functional prototype. My freelance work developing a small business website further demonstrated my ability to apply software engineering practices, as I modularized code using React and integrated a MongoDB backend for dynamic content management.
* **Security**: A Security in Computing course emphasized the importance of a security mindset, teaching me to identify and mitigate vulnerabilities. For a project, I conducted a penetration test on a mock web application, identifying SQL injection risks and implementing parameterized queries to address them. This experience informed my approach to secure coding practices. Additionally, during my internship, I contributed to implementing OAuth 2.0 authentication for a client portal, enhancing data protection and aligning with industry standards.

The ePortfolio development process itself has been a capstone of my learning, requiring me to critically evaluate my work, articulate its value, and enhance artifacts to reflect professional standards. By revisiting and improving past projects, I have demonstrated iterative growth, aligning my portfolio with employer expectations for technical proficiency, maintainability, and innovation.

## Summary and Introduction to Portfolio Artifacts

This ePortfolio showcases two enhanced artifacts that collectively demonstrate the breadth of my computer science expertise: a C++ course advising program and a web-based animal shelter dashboard with MongoDB integration. These artifacts, developed and refined during my capstone course in May 2025, highlight my ability to apply data structures, algorithms, software engineering, database management, and security practices to solve practical problems. Together, they form a cohesive narrative of my technical capabilities, illustrating my readiness to contribute to the computer science field.

The **C++ Course Advising Program** (ABCU Advising Assistance Program) manages academic course data, providing a menu-driven interface to display sorted course lists and detailed course information, including prerequisites. Enhancements include transitioning from a vector to a std::unordered\_map for O(1) average-case lookups, implementing regular expression-based input validation, and maintaining a cached sorted vector for efficient display. These improvements showcase my proficiency in data structures, algorithmic optimization, and robust software design, aligning with program outcomes for designing efficient computing solutions and employing innovative techniques.

The **Web-Based Animal Shelter Dashboard** integrates a MongoDB database with a Python-based web application, enabling users to filter, visualize, and explore animal shelter data. Enhancements include connection pooling and indexing for database performance, input validation and environment variables for security, and pagination and data export for improved user experience. This artifact demonstrates my expertise in database design, full-stack development, and security practices, addressing program outcomes for scalable database implementation and a security mindset.

Together, these artifacts reflect my ability to tackle diverse challenges, from optimizing standalone applications to building data-driven web solutions. They highlight my commitment to performance, usability, and security, making them compelling evidence of my employability. The enhancements, driven by careful analysis and iterative refinement, underscore my growth as a computer science professional capable of delivering high-quality, maintainable code.

The artifacts are supported by detailed narratives that contextualize their development, justify their inclusion, and reflect on the enhancement process. These narratives provide insight into my problem-solving approach, technical decision-making, and alignment with professional standards. As you explore this portfolio, the artifacts and accompanying documentation will demonstrate my readiness to contribute innovative, efficient, and secure solutions to the computer science field, setting me apart as a candidate prepared to excel in collaborative and dynamic environments.