MODULE 7-1 FINAL PROJECT SUBMISSION: REFLECTION

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Building a professional portfolio that highlights my unique skills, and expertise is one of the most effective ways to visually communicate my value to potential employers. The content within my ePortfolio serves as a strong foundation for presenting my abilities across key areas of Computer Science. The included projects and artifacts from various courses in the program illustrate my growth in essential domains such as software design and engineering, algorithms and data structures, and database management.

My ePortfolio reflects the knowledge and skills I have developed throughout my studies in the Computer Science program at SNHU. It showcases my academic progress and the recognition I have earned through high-quality work and honor roll achievements. Through this portfolio, I have compiled a professional-level demonstration of my technical and communication skills, ensuring that my work is clear, well-structured, and tailored to a specific audience and context.

The Computer Science program, along with the coursework in CS499, has enhanced my ability to quickly acquire new skills, approach problem-solving with intellectual humility, and adopt a leadership mindset. My expertise in technology, data analysis, software development, and technical writing is demonstrated through the artifacts included in my ePortfolio. Each course in the program has played a significant role in equipping me with the necessary knowledge and skills to pursue a career in various Computer Science disciplines.

Code reviews play a crucial role in catching errors early, making them more cost-effective to fix, enhancing team skills, and improving an organization's or individual's ability to adapt to disruptive changes. This process ultimately leads to higher-quality, more maintainable code. Conducting a thorough review of selected artifacts in software design and engineering, algorithms and data structures, and databases allowed me to develop strategies that foster collaborative environments. These environments enable diverse audiences to contribute to organizational decision-making in computer science by analyzing existing functionality, identifying areas for improvement, and implementing enhancements.

In my code review videos, I examined the three artifacts for weaknesses, limitations, and vulnerabilities while outlining my approach to improving them. This walkthrough of the source code and planned refinements provided an opportunity to strengthen my ability to deliver clear and professional oral, written, and visual communication. These reviews were conducted in a collaborative setting, ensuring that the information presented was coherent, technically sound, and tailored to a specific audience and context.

For the software design and engineering category, I selected an artifact from the CS360 Mobile Architecture and Programming course to demonstrate my ability to apply well-established and innovative computing techniques, tools, and skills in developing industry-relevant solutions. This project encompassed the entire software design and engineering process, including user experience and interface design, ensuring intuitive navigation through industry-standard icons and symbols. Additionally, a relational database was implemented to manage data creation, retrieval, updates, and deletions, supporting the application's functionality.

In designing and evaluating computing solutions, I applied algorithmic principles and industry standards while carefully managing trade-offs in design decisions. This involved assessing the relationship between algorithms and data structures, as well as the interactions between different classes, methods, and source code layouts. Furthermore, I developed a security-oriented mindset to anticipate and mitigate potential vulnerabilities in software architecture and design. By proactively identifying security risks, I implemented best practices for validating input data, structuring secure system architectures, and ensuring data protection through a default-deny security approach.

The artifact from the IT145 Foundations in Application Development course, selected for the algorithms and data structures category, highlights my approach to designing and evaluating computing solutions that address specific problems using algorithmic principles and industry standards. This project demonstrates my ability to manage trade-offs in system design, specifically in developing an authentication and authorization module alongside a monitoring system with various features and functionalities. Through this artifact, I showcased engineering considerations related to the relationships and functionality between different classes and methods, utilizing arguments, parameters, and variable scope to demonstrate my proficiency in applying established and innovative computing techniques.

Similar to my work in software design and engineering, enhancements to this artifact were guided by a security-first approach. Anticipating potential vulnerabilities, I applied best practices in software architecture to mitigate design flaws and strengthen data privacy and security. Additionally, I implemented input validation strategies and adopted a default-deny architecture to enhance system resilience. I worked with a simple linear data structure—specifically, a string array—to implement the methods within the program's classes. This allowed me to develop and assess computing solutions that adhered to algorithmic principles and computer science best practices while balancing design trade-offs effectively.

For the databases category, I selected an artifact from the CS340 Client/Server Development course. This project involved designing and developing a multi-tier application using the Model-View-Controller (MVC) architecture and RESTful protocols to extend HTTP for an application programming interface (API). The MVC pattern’s separation of concerns was a key focus, allowing for modular development and maintainability. Through this project, I applied advanced computing techniques to create a programmatic data structure that efficiently manages stored variable values across functions and callbacks within a web application.

As with my previous artifacts, security was a top priority in the enhancement process. I employed strategies to proactively identify and address potential security threats, ensuring that the application architecture was designed with privacy and data protection in mind. Input validation and a default-deny security model were integral to mitigating risks and safeguarding system resources.

My ePortfolio effectively showcases my ability to implement well-founded and innovative computing solutions that provide value and align with industry objectives. This is exemplified through functionalities such as importing CSV data files into MongoDB, integrating dependencies like the Python PyMongo driver, utilizing Python libraries and the Dash framework, and developing a CRUD module for data manipulation within MongoDB. Furthermore, I applied algorithmic principles and computer science best practices to manage design trade-offs, particularly in engineering relationships between different classes and methods within Java programming. Each artifact in my portfolio highlights my commitment to incorporating a security-focused mindset throughout the development process, enabling me to anticipate adversarial exploits, mitigate vulnerabilities, and ensure the confidentiality and integrity of data and system resources.