Professional Self-Assessment

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CS 499: Computer Science Capstone

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Throughout my computer science degree program at Southern New Hampshire University and the Computer Science Capstone course I have been able to learn and apply a lot of new knowledge and information that will greatly help in my professional goals of becoming either a controls engineer or a software engineer. The Computer Science Capstone course has helped to reinforce my strengths of being able to effectively convert code from one coding language to another, as well as my ability to implement data structures and algorithms and database management. The Software Development Lifecycle course that I have taken throughout my degree program have given me skills in collaborating in a team environment by teaching me how to work with others in an Agile framework and giving me the skills that I need to successfully network with colleagues on projects. The Systems Analysis and Design course helped me hone my skills that allow me to effectively communicate and work with stakeholders, customers, and management when working on important projects and tasks with my current work. The math classes, as well as the Data Structures and Algorithms: Analysis and Design course, have been very useful for improving the mathematical knowledge needed to be able to confidently work with data structures and algorithms while understanding how the various algorithms that I have worked on operate in an application and how to properly implement them to perform the tasks needed. There have been many courses over my degree program that have helped me hone my skills in software engineering and databases, including Client-Server Development, Emerging Systems Architecture and Design, Current and Emerging Trends in Computer Science, and Full-Stack Development. These courses have given me knowledge and insight into the best practices, pros and cons, and common pitfalls to be aware of when working with software engineering and database management. Finally, the Software Test Automation and Quality Assurance, Software Security, and Secure Coding courses have given me the ability to properly implement safety protocols and authentication measures into the applications and projects that I work on to ensure that the program and the data it contains is safe and secure from any bad actors or intruders.

The three artifacts that I chose for my enhancement plan for the Computer Science Capstone course consist of finished projects from three separate courses throughout my degree program. The first artifact is a set of unit tests for an appointment, contact, and task service manager that allows a user to read, add, modify, or delete an appointment, contact, or task held in an ArrayList. To enhance this artifact, I converted the program from a Junit testing framework using Java to a Gunit testing framework using C++. The second artifact that I chose is a program that displays a list of animals from an ArrayList that have been trained for various tasks, as well as allowing for adding new animals, modifying existing animals, or deleting entries that are no longer needed. To enhance this artifact, I decided to implement a merge sort algorithm to sort the list of animals by name before displaying the list to the user. The third artifact consisted of a program that displayed a list of rescue animals in a table on a web page that could be filtered by rescue type. To enhance this artifact, I chose to create a MEAN stack web-based application and turn the project into a functional, Single Page Application, website with a web page displaying the animals in a table that can be filtered by rescue type. These artifacts fit together into three key categories to fulfill the course outcomes, each focusing on one or two of the course outcomes. Artifact One focused on Software Design and Engineering. Through Artifact One I employed strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science, as well as developed a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources. Artifact Two focused on Algorithms and Data Structures. In Artifact Two I designed and evaluated computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution, while managing the trade-offs involved in design choices. Finally, Artifact Three focused on Databases. Through Artifact Three I designed, developed, and delivered professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts, as well as demonstrated an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific goals.