Professional Self-Assessment

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CS499 Computer Science Capstone

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Welcome to my CS-499 Capstone project. I started the Computer Science program at Southern New Hampshire University after over 20+ years in the Telecom/IT industry. I entered the program with an associate’s degree in IT/Computer Network Systems, and a strong hardware and networking background, but with limited exposure to the software development aspect of computer science. Courses such as CS-260 “Software Development Lifecycle”, and CS-320 “Software Test Automation”, provided a solid foundation for best software development practices. Other courses, such as DAT-220” Fundamentals of Data Mining”, and CS-340 “Client/Server Development”, provided the fundamentals of database management, which I found the most intriguing for a future career opportunity outside the original network engineering path I originally entered the program with, The capstone project will highlight my continued growth in software design discipline.

The capstone project begins with the code review of the applications introduced previously in the curriculum, that will be the basis for the rest of the project. Code review had been introduced in the CS-310 “Collaboration and Team Project” course. The code review I have submitted will analyze the link list application, introduced in the CS-260 course of the curriculum. This artifact will be the basis for all three enhancements in the project. The code review will demonstrate my ability to collaborate in a team environment, as I analyze the code from another developer. The review will break down the logic used by the original developer, as well as identify possible improvements. This analysis could be used by the original developers to refine their work, or in this case can be used by a new developer to expand on the code. The code review will also demonstrate my ability to communicate with stakeholders, as I define what enhancements will be made to the artifact over the course of the project.

The first enhancement will demonstrate my abilities in Software engineering. The artifact used for this enhancement is the link list application introduced in the CS-260 “Data Structures and Algorithms” course. This application takes data from a CSV file to create a link list. This application was originally developed in C++. One of the main disciplines in software engineering is the ability to translate an application into another language. In the spirit of this aspect of the discipline, I have decided to port this application to Python. Python is a language introduced in CS-200 “Computer Science’s Role in Industry”, that is widely considered one of the best languages for data analysis. Enhancement one will present a nearly duplicate application of the original, coded in another language.

The second enhancement will continue to showcase my growth in the computer science field, as I improve on the python version of the link list application I created in the first enhancement. This enhancement will improve minor functionality flaws identified in the original artifact, as well as introduce a new feature revolving around a data structure. Enhancement two will introduce a save feature missing in the original artifact. The new save feature will provide a mechanism for saving changes to the data set into a non-relational database. The choice of using a protected database to save data over rewriting to a CSV demonstrates my ability to develop with a security first approach.

The third and final enhancement in the ePortfolio will demonstrate my abilities in the use and development of databases. I have created a GUI, using Tkinter to provide an easy-to-use interface for manipulating and administering a MongoDB database. The original artifact for this enhancement is the improved version of link list developed in the second enhancement. This application will provide the ability to perform CRUD (Create, Read, Update, Delete) functions, as well as provide a mechanism to read data from the original CSV file directly into the database, making the link list of the original application obsolete. A mind set for security is also demonstrated in the future expansion of this application, as data encryption, login requirements, and MFA, while all disabled for demo purposes, provide for a much more robust security for the data.