Class: CS499 Computer Science Capstone

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**Professional Self-Assessment**

I have learned a great deal during my time in the Computer Science program at Southern New Hampshire University. All of the work I have completed up until now, has prepared me for this course. The Portfolio I have created is a showcase of the skills and abilities I have acquired and am prepared to utilize in my professional career as a developer. It focuses on the key categories of Software Design and Engineering, Algorithms and Data Structure, and Databases.

For Software Design and Engineering, I chose to showcase my ability to write programming logic in multiple code languages. In my development career, I will need the ability to work with multiple programming languages. For my enhancement, I thought it would be important to demonstrate that I have the ability to take a Create, Read, Update, and Delete (CRUD) module and write the same logic in another programming logic, Java. It’s important for developers to be able to write in multiple programming languages because different languages are more efficient for different tasks. Recognizing the importance of adaptability and when different languages are most applicable, is a great asset to me professionally.

Algorithms and Data Structures is a crucial part of Computer Science because it provides the foundation for effectively and efficiently solving system design. There is often more than one way to design a system, and developers need to be aware of the benefits and drawbacks of different design methods. For my enhancement, I thought it would be important to demonstrate my ability to improve the user experience on the dashboard user interface, while utilizing techniques that do not degrade the system or performance. I selected thoughtful enhancements that would be useful and meaningful to the users, and I specifically avoided any alterations that would negatively impact the system performance.

Data security is a very important topic today. We often hear stories about company’s that have experienced a data breach, or how unauthorized users have accessed sensitive data and altered or destroyed it. Data is one of our largest assets, and it must be properly protected. When a company’s data is lost, altered, or destroyed there can be severe consequences, not only to the company operations, but there can be legal implications as well. For my enhancement, I thought it would be important to showcase my security mindset. I added user authentication with hashing to demonstrate my ability to recognize the importance of protecting data and password information.

There are five course outcomes for CS499, and here is a breakdown of how each of my enhancements has met these objectives:

1. Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.

In my enhancement work for Software Design and Engineering, I included in my in-line comments a detailed description of the code and functionality. Developers work as a team, and it is important that we collaborate with each other on our code. Comments and code reviews are a vital part of collaboration for developers and read me files within GitHub can be important to business analysts to gain understanding about the code and its purpose.

1. Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.

For my login and user authentication enhancement, I employed strategies that illustrate this course outcome. First, I utilized red font to make the verbiage stand out to the user on the page. I utilized clear, concise language to instruct the user what they need to do to log in. This provides a better experience for the user.

1. Design and evaluate 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.

For my user dashboard enhancements under the Algorithms and Data Structures item, I had many enhancements available for selection. I carefully selected page enhancements that provided the most value to a user and chose not to utilize any options that would negatively impact the performance of the page, or the usability. For example, I could easily have added the ability to view all records from a query, but that could severely impact the page performance. If too many records were returned the page could potentially crash or become very slow. It would also be difficult or unpleasant for the user to scroll through too much on the screen.

1. Demonstrate 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.

In my user dashboard enhancement, I utilized innovate techniques for the user interface. The purpose of this database is to locate animals that meet multiple search criteria. I added functionality to sort multiple columns at once and enabled filtering by column. This is important functionality for the users to easily identify animals that meet their search criteria.

1. Develop 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.

My enhancement for the user dashboard includes a user login and authentication. This enhancement demonstrates my ability to recognize that data needs to be protected and user authentication is necessary for protection of a database. Additionally, I utilized hashing to protect the storage of user entered passwords.