Professional Self-Assessment

CS-499 Capstone

**Introduction:**

My name is Nick Burnette, and I have a B.S. in Computer Science. My areas of focus are software engineering, AI, full-stack web design, and Android App design.

This self-assessment allows me to reflect on the coursework through this program and the projects that demonstrated various program outcomes.

I was motivated to enter the field of Computer Science because I had been limited by my lack of technical understanding. For example, I had designed and released a couple of video games on STEAM and other platforms, and the scope of these games were limited to what I was able to figure out, with performance issues I wasn’t able to optimize.

Since completing the B.S. program, I now have a wide variety of skills at my disposal, with a greater understanding of how they work. I am able to pull projects together quickly through libraries, able to debug complex systems through logs and error codes, and gained tremendous insight into the importance of UI/UX design.

**Program Outcomes:**

There were 5 course outcomes that I achieved throughout the CS-499 Capstone course.

**1: Software Engineering and Design** – I demonstrated the ability to design and evaluate computing solutions. For example, I redesigned the Android app UI/UX and refactored database logic using Room, demonstrating design principles and modular programming.

**2: Algorithms and Data Structures** – I implemented CRUD operations with MongoDB and Python, improving efficiency using indexing and optimized queries.

**3: Databases** – Through normalization and Room persistence migration, I maintained data integrity and implemented scalable architecture.

**4: Security** – I identified and mitigated security risks in computing solutions. In a MEAN stack project, I added JWT authentication for secure admin login, ensuring encrypted credential handling.

**5: Professionalism and Ethical Responsibilities** – Effective communication becomes a standard through papers and discussions with my peer group. Exploring the ethical implications of software design as tools that can be used to help people was incredibly insightful.

**Artifacts:**

In Artifact 1, I reviewed the UI/UX and improved the features from the base version with an improved layout, improved motivational messages, and more features. This demonstrated strengths in analysis and design, as well as understanding what an app should offer to give the user more value.

In Artifact 2, I added an algorithm that analyzed the user’s trends and used it to provide useful information to the user. This demonstrated critical organizational ability by identifying a need, deciding upon a new algorithm, organizing its creation and implementation, and then testing it for proper functionality. This required a selection of skills across a number of disciplines.

In Artifact 3, I migrated the SQLite database over to Room with Dao. This involved a tremendous amount of understanding of how databases are implemented, called, and how to upgrade an existing system. A variety of tests and message logs were used until I was able to successfully migrate the old data in and replace the old system with the new.

**Conclusion:**

The flexibility and understanding required to perform these tasks demonstrate my readiness to enter the field. I relish the chance to perfect my skills, and I thoroughly enjoy the challenge of learning new ones. I’m looking forward to the adventures that await as I continue refining my Android development and AI integration skills through personal projects. Additionally, I intend to pursue professional certifications while also contributing to open-source projects that emphasize ethical software design. These pursuits will guide me as I continue to advance in the computer science profession.