CS499 Module 4 Journal

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While I haven’t changed my core career plan, I’ve definitely refined it. I originally entered the Computer Science program with a broad goal of working in software development. Over time, I’ve discovered a real interest in backend systems, automation, and systems-level design. Projects like this capstone helped me realize how much I enjoy building modular, scalable programs with clean data structures and logic-driven design.

My thinking has evolved from simply “I want to code” to “I want to architect solutions.” I now approach software with a mindset of how to structure it well, secure it properly, and make it maintainable for the long run. I also better understand the importance of documentation, collaboration, and aligning technical decisions with business goals, which has shaped how I plan and build projects.

I’ve completed research on what employers look for in junior software engineers, backend developers, and systems engineers. This research has guided my focus toward mastering core tools such as Git, Python, SQL, and logging systems, and it has reinforced the value of understanding clean architecture and solid programming patterns. It’s also pushed me to become more comfortable working in team-based workflows and to explore cloud computing platforms. I’ve also started exploring potential certifications such as AWS Certified Developer or Solutions Architect and Python’s PCAP certification. I may consider pursuing a master’s degree in software engineering or systems design in the future, depending on where my career takes me.

So far, the course outcomes I have achieved are:

*“Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.”* This was accomplished by creating the code review documentation, presentation video and voice that was submitted in module two.

*“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 (software engineering/design/database)”* This is an outcome in multiple phases as the initial codebase from the transition from Java to Python has been completed, the solutions have begun to take shape in the code database. There still needs some modularizing and cleaning of the code, which I plan to do once I get the database up and running.

*"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 (data structures and algorithms)"*

In module 3 I have added sort, search and a full working menu in a clean, modular and scalable way. In the final enhancement, these will take their final form through a working SQLite database, so this course outcome still has more progress to be made.

*"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"*

I've been looking forward towards this implementation for the whole project, which will begin to take shape once I implement the full database for the project and incorporate the necessary security features, such as protection against the most common forms of SQL injection attacks.

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

While this outcome is a bit harder on a solo project, I do aim to design and implement code in a way that is user friendly across all who might interact with the program. I do consider my professor as a collaborator, since he is helping guide me in this project, providing meaningful feedback and monitoring my overall progress.

**Artifact Progress Update:**

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| --- | --- | --- | --- |
| **Checkpoint** | **Software Design and Engineering** | **Algorithms and Data Structures** | **Databases** |
| **Name of Artifact Used** | CS145 Animal Shelter | CS145 Animal Shelter | CS145 Animal Shelter |
| **Status of Initial Enhancement** | Begun port to Python. Base program with dog, monkey, main and rescue\_animal class created. Basic logic and working program. Logging logic created and functional. The try/except blocks help to prevent crashes from invalid user input. SQL injection attack prevention will be accomplished once the database is functional, but is built into design consideration. | Implemented dictionary for faster lookups. Implemented ability to search for animal by name, availability, breed and country. Added option for sorting animals alphabetically by name or country.  Once the database is created through SQLite, some of these function calls will be adjusted to interact with database | Not started |
| **Submission Status** | Submitted initial enhancement. | Submitted initial enhancement. | Not Submitted |
| **Status of Final Enhancement** | Not Finished | Not Finished | Not Finished |
| **Uploaded to ePortfolio** | No | No | No |
| **Status of Finalized ePortfolio** | Not Finished | Not Finished | Not Finished |