# CS 499 Module One Assignment

Alex Surprenant

CS-499 Computer Science Capstone

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1. **Self-Introduction:** Address all of the following questions to introduce yourself.
   1. How long have you been in the Computer Science program?

**I have been studying computer science at SNHU for over three years with the goal of earning my BS in Computer Science.**

* 1. What have you learned while in the program? List three of the most important concepts or skills you have learned.

**I feel that I have received a very broad yet robust education at SNHU, diving into all aspects of computing, most of which was and still is very new to me. I have learned a lot about many programming languages including Python, Java and C++. I learned about how operating systems work at the most fundamental level, and I have learned how to build a full stack application including both front and backend.**

* 1. Discuss the specific skills you aim to demonstrate through your enhancements to reach each of the course outcomes.

**Throughout this course, I hope to demonstrate skill in converting a program from one language to another. The use of algorithms in programming, and utilizing database functionality.**

* 1. How do the specific skills you will demonstrate align with your career plans related to your degree?

**My hope is for the culmination of all of my efforts to lead to a job in the web development field. I feel that all three of the enhancements we need to complete in this class will lead me closer to this outcome.**

* 1. How does this contribute to the specialization you are targeting for your career?

**Building better UI, working with databases on the backend, and gaining a stronger grasp on algorithms will all help me in achieving my specialization.**

1. **ePortfolio Set Up:**
   1. Submit a **screen capture** of your ePortfolio GitHub Pages home page that clearly shows your URL.
      1. You already have a repository in GitHub where you uploaded projects in previous courses. Your ePortfolio will reside in GitHub but can link to work at other sites, such as Bitbucket.
   2. Use the GitHub Pages link in the Resource section for directions on:
      1. How to create your GitHub website and publish code to GitHub Pages
      2. Issues, such as adding links to other sites
   3. Paste a screenshot of your GitHub Pages home page with your URL clearly showing in the space below.’

**This is an image of the first draft of my GitHub ePortfolio. I have chosen to build my own theme using what I have learned about front end web development. This will be one more way for me to demonstrate my technical skills to future employers.**

**A screenshot of a computer

AI-generated content may be incorrect.**

1. **Enhancement Plan:** 
   1. **Category One:** Software Engineering and Design
      1. **Select an** **artifact** that is **aligned with** **the** software engineering and design **category** and explain its origin. Submit a file containing the code for the artifact you choose with your enhancement plan.

**I will be using the Inventory Database application from CS-360: Mobile Architecture and Programming to complete the first enhancement category for Software Engineering and Design**

Note: Your artifact may be work from the following courses:

* IT 145: Foundation in Application Development
* CS 250: Software Development Lifecycle
* CS 260: Data Structures and Algorithms
* IT 315: Object Oriented Analysis and Design
* CS 320: Software Testing, Automation, and Quality Assurance
* CS 330: Computational Graphics and Visualization
* CS 340: Advanced Programming Concepts
* CS 350: Emerging Systems Architectures and Technologies
* CS 360: Mobile Architecture and Programming
* IT 365: Operating Environments
* IT 380: Cybersecurity and Information Assurance
* CS 405: Secure Coding
* CS 410: Reverse Software engineering
* IT 340: Network and Telecommunication Management
* IT 380: Cybersecurity and Information Assurance
  + 1. **Describe** a practical, well-illustrated **plan** for enhancement in alignment with the category, including a pseudocode or flowchart that illustrates the planned enhancement.

**For the first enhancement, I will add better functionality and complexity, adding more interactivity to how the user will increase and decrease the amount of products in the inventory, as well as make the delete button function, and create a method for adding items to the list as well. I would like to improve the user interface, making it more robust and user friendlt, and I would like to convert the program from Java to Kotlin.**

For this category of enhancement, consider improving a piece of software, transferring a project into a different language, reverse engineering a piece of software for a different operating system, or expanding a project’s complexity. These are just recommendations. Consider being creative and proposing an alternative enhancement to your instructor.

Think about what additions to include to complete the enhancement criteria in this category. Since one example option is to port to a new language, that is the kind of scale that is expected. This does not mean you need to port to a new language but instead have an equivalent scale of enhancement. Underlying expectations of any enhancement include fixing errors, debugging, and cleaning up comments, but these are not enhancements themselves.

* + 1. Explain how the planned enhancement will **demonstrate** specific **skills** and align with course outcomes.
       1. Identify and describe the specific skills you will demonstrate that align with the course outcome.

**Skills I will demonstrate with this enhancement will include adding complexity to my code. Showing my proficiency in multiple coding languages, as well as my ability to iterate on a program by adding more features.**

* + - 1. Select one or more of the course outcomes below that your enhancement will align with.

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

**4. 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.**

Course Outcomes:

1. Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.
2. Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.
3. 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.
4. 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.
5. 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.
   1. **Category Two:** Algorithms and Data Structures
6. **Select an artifact** that is **aligned with the** algorithms and data structures **category** and explain its origin. Submit a file containing the code for the artifact you choose with your enhancement plan. You may choose work from the courses listed under Category One.

**I will be using the Inventory Database application from CS-360: Mobile Architecture and Programming to complete the second enhancement category for Algorithms and Data Structures**

1. **Describe** a practical, well-illustrated **plan** for enhancement in alignment with the category, including a pseudocode or flowchart that illustrates the planned enhancement.

**For the DSA enhancement of this project, I would like to add a search feature, and a sorting filter to this program. The search feature would be implemented with a search algorithm to find items in the inventory based on user input. I would also implement an algorithm that would detect duplicate entries into the database and prevent them from happening.**

For this category of enhancement, consider improving the efficiency of a project or expanding the complexity of the use of data structures and algorithms for your artifact. These are just recommendations. Consider being creative and proposing an alternative enhancement to your instructor. Note: You only need to choose one type of enhancement per category.

Think about what additions to include to complete the enhancement criteria in this category. Since one example option is to port to a new language, that is the kind of scale that is expected. Perhaps you might increase the efficiency and time complexity of an algorithm in an application and detail the logic of the increased time complexity. Remember, you do not need to port to a new language but instead have an equivalent scale of enhancement. Underlying expectations of any enhancement include fixing errors, debugging, and cleaning up comments, but these are not enhancements themselves.

1. Explain how the planned enhancement will **demonstrate** specific **skills** and align with course outcomes.
   1. Identify and describe the specific skills you will demonstrate to align with the course outcome.

**Implementing these enhancements to the project will demonstrate my understanding of algorithms and their interactions with data structures. Specifically, utilizing search algorithms and applying them to the user experience.**

* 1. Select one or more of the course outcomes listed under Category One that your enhancement will align with.

**3. 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.**

**5. 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.**

* 1. **Category Three: Databases**
     1. **Select an artifact** that is **aligned with the** databases **category** and explain its origin. Submit a file containing the code for the artifact you choose with your enhancement plan. You may choose work from the courses listed under Category One.

**I will be using the Inventory Database application from CS-360: Mobile Architecture and Programming to complete the third enhancement category for Databases**

* + 1. **Describe** a practical, well-illustrated **plan** for enhancement in alignment with the category, including a pseudocode or flowchart that illustrates the planned enhancement.

**I will be connecting my android application to the built in SQLite, as it is a lightweight database built directly into the android device. This will lend well to keeping persistent data and having a more dynamic program.**

For this category of enhancement, consider adding more advanced concepts of MySQL, incorporating data mining, creating a MongoDB interface with HTML/JavaScript, or building a full stack with a different programming language for your artifact. These are just recommendations; consider being creative and proposing an alternative enhancement to your instructor. Note: You only need to choose one type of enhancement per category.

Think about what additions to include to complete the enhancement criteria in this category. Since one example option is to port to a new language, that is the kind of scale that is expected. Perhaps you might increase the efficiency and time complexity of an algorithm in an application and detail the logic of the increased time complexity. Remember, you do not need to port to a new language but instead have an equivalent scale of enhancement. Underlying expectations of any enhancement include fixing errors, debugging, and cleaning up comments, but these are not enhancements themselves.

* + 1. Explain how the planned enhancement will **demonstrate** specific **skills** and align with course outcomes.
       1. Identify and describe the specific skills you will demonstrate that align with the course outcome.

**For this enhancement. I will connect this application to the built in SQLite database in the android operating system. This enhancement will allow the application to store and manage persistent data, so that even when the application is closed, the data will remain. I will design the database to save each item the user adds to the list, including the items unique ID, item name and inventory levels. This will also make the project more usable in a collaborative environment, as users can manage inventory levels across multiple platforms.**

* + - 1. Select one or more of the course outcomes listed under Category One that your enhancement will align with.

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

**4. 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.**

1. **ePortfolio Overall Skill Set**
   1. Accurately describe the **skill set** to be illustrated by the **ePortfolio** **overall**.
      1. Skills and outcomes planned to be illustrated in the code review

**In the review, I will cover in detail, the current state of the application, and then discuss in more detail the enhancements I plan to integrate into the overall program. I will be able to use that format to show how my program can be both a technically proficient and collaborative tool, as well as a demonstration of well rounded technical ability.**

* + 1. Skills and outcomes planned to be illustrated in the narratives

**The written narratives for the ePortfolio will be a great way for me to discuss each enhancement for the project in a detailed manner. I will show how I came to decide on each enhancement, and what skill I was hoping to demonstrate by integrating them. I look forward to the narrative discussion in which I dig deeper into my professional experiences, as well as where I aspire to be in the future.**

* + 1. Skills and outcomes planned to be illustrated in the professional self-assessment

**In my professional self-assessment, I will show who I am, and what skills I have learned across my journey at SNHU. These will include my deepened knowledge of data structures and algorithms, the different languages I have learned along my path including Java, Python, JavaScript and C++. I will also use the self-assessment as an opportunity to discuss what I think my challenges are and where I believe I need to improve upon in my work and my career.**