# CS 499 Module One Assignment Template

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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 in the general field of technology since 2016 while in high school. I was dually enrolled, and therefore able to earn my Associate’s in Networking and Cybersecurity in 2020 and have been studying Computer Science since then.**

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

**More recently, while in the Computer Science program specifically, I have gained a plethora of knowledge. Three important skills I have learned thus far include learning about database systems such as SQL and MongoDB, programming fundamentals and different languages (Python, C++, java, etc.), and more in depth software engineering to design, test, and maintain software systems.**

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

**For this project I aim to demonstrate an understanding of software design principles, algorithmic thinking, and database management. Through the enhancements I make I’ll be able to showcase my ability to; design solutions to be scalable and maintained, optimize performance utilizing efficient algorithms and data structures, and implement robust and secure data handling practices. The improvements through my enhancements in this course should be an excellent way to present how I’ve improved as a student within the Computer Science program.**

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

**My educational and career goals involve pursuing a master’s in cybersecurity, to then go on to potentially be a security analyst at a company, to help detect, record, and then prevent networking threats from reaching a company. The skills being demonstrated within this course will accentuate my resume, making me a more well-rounded and ideal candidate for that position or whichever other position I may pursue.**

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

**Being able to update, code, and configure an app to its full capabilities is an excellent skill to present on a resume, and in the instance, I would like to work for an app development company, knowing the backend of any software you’re working with is essential in the cybersecurity field.**

1. **ePortfolio Set Up:**

**A screenshot of a computer

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This is the base model of my GitHub Pages site that can be easily refined as I go through the course.

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.

**The artifact I’ve chosen to complete the Software Engineering and Design Enhancement is from the CS 360: Mobile Architecture and Programming course. Within Project Two of that course my goal was to create a mobile app through Android Studio. The application’s intention was to be a warehouse inventory application that could hold and display data for inventory within a warehouse or similar environment.**

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

**To enhance the application’s user experience, I will implement a dark mode feature to provide users with a customizable visual theme. First, I will review the current UI design and identify components requiring dark mode adaptations. Then, I will create a base theme XML file for light mode and a corresponding values-night/themes.xml file for dark mode. The app will include a settings screen with a toggle to allow users to switch themes dynamically. Finally, I will thoroughly test the implementation across various devices to ensure a consistent and accessible experience for all users.**

A diagram of a project

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* + 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.

**Implementing the dark mode feature demonstrates the ability to create inclusive, user-centered solutions that consider diverse preferences and accessibility needs, aligning with the course outcome of building collaborative environments for diverse audiences. By designing an adaptable theme and using Android Studio’s tools like XML and Material Design, this enhancement showcases the use of innovative techniques and industry-standard practices. The dynamic theme toggle allows users to personalize their experience, reflecting a collaborative approach to meeting user needs. This enhancement not only improves user experience but also highlights the ability to implement well-founded solutions that deliver value and align with industry-specific goals.**

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

**The course outcomes below that will be evident within this enhancement are options 1 (**Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.) **and 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**), as explained in the above paragraph.**

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.

**The artifact I’ve chosen to complete the Algorithms and Data Structures Enhancement is from the CS 360: Mobile Architecture and Programming course. Within Project Two of that course my goal was to create a mobile app through Android Studio. The application’s intention was to be a warehouse inventory application that could hold and display data for inventory within a warehouse or similar environment.**

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

**To improve functionality, I will implement sorting and searching features within the application. Initially, I will review the app’s data handling structure and input test data to simulate real-world usage. The sorting feature will allow data to be organized based on criteria such as priority or date, using a custom algorithm integrated into the existing logic. Additionally, a search bar will enable users to filter data dynamically, enhancing usability and performance. These enhancements will be rigorously tested with edge cases to ensure reliability and efficiency.**

A diagram of a data structure

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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.

**This enhancement demonstrates the ability to design and evaluate computing solutions by implementing sorting and searching algorithms that address specific user needs, such as prioritizing data and improving the search experience. By applying algorithmic principles, such as custom sorting algorithms and efficient data filtering, the project showcases how design choices impact performance and usability. The implementation balances trade-offs between complexity and efficiency, ensuring that the solution remains both effective and scalable. Additionally, using industry-standard tools and techniques, such as Android’s built-in libraries and data handling practices, ensures that the solution aligns with well-founded, innovative practices that deliver value and support industry goals.**

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

**The course outcomes below that will be evident within this enhancement are options 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**) and 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**) per my explanation above.**

* 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.

**The artifact I’ve chosen to complete the Databases Enhancement is from the CS 360: Mobile Architecture and Programming course. Within Project Two of that course my goal was to create a mobile app through Android Studio. The application’s intention was to be a warehouse inventory application that could hold and display data for inventory within a warehouse or similar environment.**

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

A diagram of database processing

Description automatically generated with medium confidence**To improve the app’s usability and demonstrate its functionality, I will prepopulate the database with editable data. This will involve creating a JSON, CSV, or similar file containing sample entries, which will be stored in the app’s assets or raw directory. Upon the first launch, the app will parse the file and insert its contents into the database. Users will then be able to modify, delete, or expand this preloaded data through the app’s interface, making the database adaptable to their needs. This enhancement will be tested to ensure the data loads correctly, persists across sessions, and supports user edits seamlessly.**

* + 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.

**This enhancement demonstrates the ability to design a collaborative, user-centered solution by providing users with the flexibility to modify and interact with preloaded data, aligning with the course outcome of building environments that support diverse needs. By allowing users to manage the data directly, the app encourages collaboration through customization, ensuring that it accommodates a variety of user preferences and use cases. Additionally, the process of securely parsing and storing data from external files, while ensuring it persists across sessions, reflects a security-minded approach. It anticipates potential vulnerabilities by focusing on secure data storage and handling practices, safeguarding user data and preventing unauthorized access to sensitive information.**

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

**The course outcomes below that will be evident within this enhancement are options 1 (**Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science**) and 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**) per my explanation above.**

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

**The code review will illustrate my ability to compose clean, maintainable, and efficient code while following best practices for coding. It will highlight my knowledge of software design principles, such as modularity and scalability, and demonstrate proper debugging and optimization techniques. This section of review will also demonstrate my capability to apply effective error handling, testing, and documentation techniques to produce high-quality software solutions.**

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

**The narratives will emphasize my problem-solving process and the strategic decisions behind the design and implementation of my project enhancements. They will illustrate how I identified challenges, evaluated potential solutions, and applied technical skills to achieve project objectives. Additionally, the narratives will demonstrate my ability to connect my work to broader industry practices, showcasing critical thinking, adaptability, and a user-centered approach to software development.**

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

**The professional self-assessment will reflect on my growth as a developer within the Computer Science program and the practical application of the skills gained throughout this program. It will highlight how I have sharpened my technical expertise, communication skills, and ability to independently manage and complete complex projects. This section will also illustrate my understanding of professional ethics, lifelong learning, and readiness to contribute effectively in a dynamic, technology-driven workplace.**