# CS 499 Module One Assignment Template

Complete this template by replacing the bracketed text with the relevant information.

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

I’ve been in the program since 2022 and this is my second to last term, I will be done by May.

* 1. What have you learned while in the program? List three of the most important concepts or skills you have learned.
* How to Debug and Problem Solve.
* How to Build an App from Scratch.
* Fundamentals such as what caching is and how memory is managed, Algorithm and Data Structures.
  1. Discuss the specific skills you aim to demonstrate through your enhancements to reach each of the course outcomes.

I want to create a program that meets industry standards in terms of user experience and functionality based on the enhancements I make. I am choosing to improve a mobile application that involves full-stack development, including components such as the user interface, database, multiple languages (XML, CSS, Java, Kotlin), CRUD operations, notifications and user authentication.

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

The enhancement will show that I can create a professional looking application without any bugs, and show my expertise in different concepts such as ux design, database architecture, language proficiency and fullstack capabilities.

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

This will show versatility and will complement well with other projects I’ve built on my free time which mostly include Web Based Applications.

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.

A screenshot of a computer

Description automatically generated

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 would like to work on my event tracker app fom CS 360: Mobile Architecture and Programming  class. It’s a CRUD application that allows users to track events and dates. I would like to change the language from Java to Kotlin. Additionally, the app does not include text notification, I would like to notify users through sms when the current date matches the event date.

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.

To change the overall coding plan we will first review our code and then we will review basics of Kotlin. We will start with the lowest impact code and move up from their as to not completely change the functionality of the entire code base. For instance, we have an Authentication section that do not impact much of the rest of the code base, we can start making changes their first.

Here is an example of a java converted into Kotlin:

button.setOnClickListener {

val event = eventData.text.toString()

val date = eventDate.text.toString()

if (event.isEmpty() || date.isEmpty()) {

Toast.makeText(this@add\_event, "Empty event or date", Toast.LENGTH\_LONG).show()

} else if (!checkDate(date)) {

Toast.makeText(this@add\_event, "Date format incorrect, Use: yyyy-mm-dd", Toast.LENGTH\_LONG).show()

} else {

DO SOMETHING}

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.

The planned enhancement will show my understanding of multiple languages; more specifically, it will show that I have a strong fundamentals which allows me to implement a completely different coding language without having any prior understanding of said language.

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

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.

For Algorithm and Data Structures, I would like to implement a sorting function that will sort the events based on dates from most recent to to least recent. If there is time I would also like to add option to sort from priority that sorts the events from highest priority to lowest priority.

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

Pseudocode:

procedure DateSort(dates)

n = length(dates)

repeat

swapped = false

for i from 0 to n-2 do

if array[i] > array[i+1] then

swap(array[i], array[i+1])

swapped = true

end if

end for

until not swapped

end procedure

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.

The skill demonstrated in this enhancement is my ability to problem solve and implement an algorithm based on the needs of the user.

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

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.

* 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.

For database I would like to change my database from SQLite to Firebase; particularly because it allows for SMS notification, I wasn’t able to get my notification working properly for my original app and based on research Firebase allows for easy notification implementation.

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

The main plan is to convert the SQLite database to Firebase. We will download firebase and all it’s dependencies, review syntax for firebase and convert our code to match the firebase syntax.

**Here is an example of firebase crud syntax:**

db.collection("users").add(user)

.addOnSuccessListener { documentReference ->

Log.d("Firebase", "User added with ID: ${documentReference.id}")

}

.addOnFailureListener { e ->

Log.w("Firebase", "Error adding document", e)

}

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.

This enhancement demonstrates my knowledge of databases and the types of databases suitable for various situations. It also showcases my ability to design a database for a mobile application.

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

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. **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
2. The code review will show case my understanding of building a fullstack application from scratch. It will highlight my fundamental knowledge of core programming concepts as well as showcase language proficiency. The outcome would be to employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.
   * 1. Skills and outcomes planned to be illustrated in the narratives

The naratives will showcase my skill to debug, and work on an existing codebase to enhance a project by adding new features and changing the core aspects of the projects such as coding language and database. The outcome would be to 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.

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

On the self assessment I’d like highlight breadth of all that I’ve learned in the program and show case a polished and professional application that meets industry standards and touches various software engineering concepts such as design, database, data structure and algorithm and security. The outcome would be to employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.