## **Enhancement Two: Algorithms and Data Structure**

**Briefly describe the artifact. What is it? When was it created?**The artifact is a comprehensive implementation of various algorithms and data structures, initially developed as part of my coursework in the Computer Science program. The specific focus is on efficient search and sorting algorithms, such as quicksort and binary search. The code was initially written in Java and later converted to Python to align with modern development practices and enhance readability and maintainability. The artifact was created during the early stages of my program and has been incrementally improved over time.

**Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in algorithms and data structure? How was the artifact improved?**I selected this artifact for inclusion in my ePortfolio because it effectively showcases my proficiency in implementing and optimizing fundamental algorithms and data structures. The specific components that highlight my skills include the efficient implementation of quicksort and binary search, as well as the transition from array-based structures to hashmap/dictionary data structures. These improvements not only optimized performance but also demonstrated my ability to adapt and enhance existing codebases. The artifact was improved by converting the code from Java to Python, focusing on readability, and leveraging Python's powerful data structures for better efficiency.

**Did you meet the course outcomes you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?**Yes, I met the course outcomes planned for this enhancement. The primary goals were to demonstrate the ability to implement efficient algorithms and to enhance existing code to improve performance and maintainability. By converting the code to Python and optimizing the data structures, I successfully met these outcomes. There are no significant updates to my outcome-coverage plans at this point, as the enhancements align well with the initial goals.

**Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**Enhancing and modifying the artifact provided valuable learning experiences. I deepened my understanding of algorithm optimization and the practical benefits of using more efficient data structures. The transition from Java to Python taught me the importance of choosing the right programming language for a given task, considering factors like readability and ease of implementation. One of the challenges I faced was ensuring that the converted Python code maintained the same level of efficiency and correctness as the original Java code. Debugging and testing were crucial to overcoming this challenge and ensuring the final product met the required standards.