**Tyler Dickerson**

4-2 Milestone Three: Enhancement Two: Algorithms and Data Structure

**Overview**

For this milestone, I will re submit and perform enhancements to the AnimalShelter application, focusing on algorithms and data structures. These enhancements will showcase my skills in data encryption, advanced indexing, efficient data retrieval, and bulk data operations.

**Planned Enhancements**

Data Encryption: Enhance data encryption to ensure sensitive information is securely stored.

Advanced Indexing: Implement additional indexes for optimized queries.

Optimized Data Retrieval: Implement more efficient query mechanisms and processing.

Bulk Data Operations: Implement bulk data insertion for efficient handling of large datasets.

**Narrative**

**Briefly Describe the Artifact**

The artifact is a Python-based application for managing animal records in a MongoDB database. It was initially created as part of a course project in the Computer Science program (CS340).

**Justify the Inclusion of the Artifact**

This artifact is included in my ePortfolio because it demonstrates my ability to design and implement efficient algorithms and data structures. The specific components that showcase my skills include:

Enhanced data encryption for secure storage.

Advanced indexing strategies for optimized queries.

Implementation of optimized data retrieval mechanisms.

Efficient bulk data insertion methods.

Meeting Course Outcomes

The planned enhancements aim to meet the following course outcomes:

**Design and evaluate computing solutions:** By implementing advanced indexing and optimized data retrieval.

Demonstrate the ability to use well-founded techniques: By enhancing data encryption and implementing bulk data operations.

Develop a security mindset: By ensuring secure data encryption and management.

These enhancements align with my outcome-coverage plans, showcasing my proficiency in algorithms, data structures, and secure data management.

**Reflection on the Process**

Enhancing this artifact provided insights into advanced data management techniques and security practices. Challenges included configuring data encryption and optimizing query performance. These challenges improved my problem-solving skills and deepened my understanding of secure and efficient data structure management.