2-2 Milestone: Code Review

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CS-499: Computer Science Capstone

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May 15th, 2025

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The animal_shelter.py script I developed is a Python class that handles CRUD operations for a MongoDB database containing animal shelter records. While the code works as intended, reviewing it now reveals several areas where I can improve the implementation to meet professional standards.

In terms of software design, I notice the database and collection names are hardcoded as AAC and animals. This limits flexibility since the class can't be easily reused with different databases. I plan to modify this by making these names configurable parameters in the constructor. The error handling currently uses print statements, which isn't ideal for production code. I'll upgrade this to use Python's logging module for more robust error tracking. The class also doesn't support transactions, which could be important for maintaining data consistency during complex operations.

Looking at the algorithms and data structures, the read method returns all documents when given an empty query. While convenient, this could cause performance issues with large datasets. I'll implement pagination using skip and limit parameters to control result sizes. The input validation could also be stronger - right now it only checks for empty inputs but doesn't validate the structure of the data. I'll add scheme validation to ensure data conforms to expected formats before database operations.

For database security, there are several improvements needed. The connection string is currently passed without encryption, which could expose credentials. I'll implement TLS encryption to secure the connection. The code doesn't use connection pooling, which might lead to resource issues under heavy load. I'll add proper connection pooling configuration. Error messages currently print potentially sensitive information - I'll replace these with secure logging.

Finally, I'll add context manager support (using **enter** and **exit**) to ensure database connections are properly closed.

These planned enhancements will make the code more flexible, efficient, and secure. The improvements will demonstrate my ability to apply professional software engineering practices, optimize algorithms for performance, and implement secure database interactions. For my video submission, I'll walk through each of these areas, explain the current limitations, and demonstrate how I'll implement the improvements.