# Artifact Narrative – Animal Shelter (Databases)

## Artifact Description

The artifact I selected for the Databases category is my Animal Shelter database project from CS 340: Client/Server Development. This project originally implemented a database-driven application that allowed users to query, insert, and update animal records. The base version functioned correctly but had limited query complexity, lacked advanced database concepts, and did not provide robust error handling or interfaces for future extensibility.

## Justification for Inclusion

I chose this artifact because it demonstrates my ability to integrate databases into a complete application. The enhancements I implemented showcase advanced database usage, improved interfaces, and better data validation.  
  
Specifically, this artifact showcases:  
- The use of MongoDB with more complex queries to support advanced data retrieval.  
- Enhanced data validation and error handling when inserting or updating records.  
- A more modular design with repository patterns to abstract database logic from business logic.  
- Improved interface functions to allow smooth integration with a front-end or service layer.  
  
These enhancements highlight my growth in working with databases, ensuring both correctness and scalability.

## Reflection on the Enhancement Process

Enhancing the Animal Shelter project taught me the importance of database design and modular architecture. One challenge I faced was designing efficient MongoDB queries to support new use cases, such as filtering animals by multiple conditions (e.g., species, adoption status, and location). I overcame this by experimenting with query operators and validating performance using sample datasets.  
  
Another challenge was ensuring data integrity. By adding validation routines before write operations, I prevented invalid or incomplete records from being saved, improving the reliability of the system. I also added error handling for database connection issues, which would be essential in a production environment.  
  
Through this process, I reinforced my ability to think about scalability and maintainability, ensuring the project could be expanded into a full-stack application in the future.

## Course Outcomes Demonstrated

Through this enhancement, I demonstrated the following outcomes:  
- Databases: Applied advanced MongoDB queries and improved validation to create a more robust application.  
- Software Engineering: Used the repository design pattern to improve modularity and separate concerns.  
- Security Mindset: Implemented input validation and error handling to ensure reliability and protect data integrity.  
- Tools and Techniques: Leveraged MongoDB’s flexible query capabilities and best practices in database-driven development.

## Conclusion

This enhanced Animal Shelter artifact represents my growth in applying database principles within a professional application. By expanding queries, strengthening validation, and modularizing the architecture, I transformed a basic project into a more reliable, scalable, and industry-ready solution.