### SNHU

### CS - 499

### Milestone 4 Narrative

Matthew Minton

### Professor Anna Sandifer

10/5/2025

**Artifact Description**

The artifact I chose to enhance is the Rescue Animal System, originally developed in IT 145 and expanded in later courses. It began as a simple command-line program for intaking, reserving, and viewing animals in training. For this milestone, I integrated an SQLite database to persist animal records beyond program runtime. I created a DatabaseConnector and CRUD operations for interacting with the database, while still using HashMaps and in-memory storage for testing. This setup allowed me to keep testing fast and controlled while making the production system more realistic and reliable.

**Justification for Inclusion**

This artifact demonstrates my ability to combine data structures with database persistence in a professional way. The database integration makes the program practical for real-world use, while maintaining HashMaps in testing highlights my understanding of modular design and test-driven development. The CRUD structure shows that I can organize database operations in a clean and maintainable way, and the in-memory setup with JUnit ensured data integrity and correctness without impacting the production database.

**Course Outcomes**

This enhancement aligns with outcomes related to designing and implementing effective computing solutions. Integrating SQLite required me to apply software engineering practices that balance maintainability, reliability, and testing. Keeping HashMaps for in-memory testing while adding a persistent database shows my ability to adapt solutions to different environments. This demonstrates my skills in both software design and database management.

**Reflection on the Process**

Through this enhancement, I learned the importance of combining persistence with testability. It was challenging to ensure consistency between the in-memory storage and the database, but using a layered approach helped. I also had to refine validation so invalid data would not enter either storage system. Overall, I gained valuable experience in integrating databases into an existing system while still maintaining fast and reliable testing workflows.