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CS 499

Artifact 3 Narrative

The artifact I chose is a Contact Management application developed in Java. It was originally created during CS 320: Software Testing, Automation, and Quality Assurance. The application allows users to create retrieve, update and delete contact records. For this enhancement, I replaced the original in memory storage (a HashMap) with a persistent MySQL relational database and implemented JDBC to handle database operation securely using prepared statements.

I chose to include this artifact in my ePortfolio because it demonstrates my ability to integrate core software engineering skills with database systems. The enhancement improved the application’s scalability and data integrity by introducing persistent data storage and a real-world database connection. The use of prepared statements shows my understanding of the best practices in protecting against SQL injection and handling external data safely. I also added integration testing to check the application’s behavior in a database environment.

This enhancement supports course outcomes 3, 4 and 5. By replacing the in-memory storage with a MySQL database and implementing data validation, I designed and evaluated a more scalable solution. Using JDBC, prepared statements and integration testing, I used established tools and innovative techniques to deliver reliable software. I also incorporated a security mindset by protecting against SQL injection and making sure only validated data could get to the database layer.

This enhancement process caused me to think more critically about real world software deployment. I learned a lot about relational databases, SQL syntax, JDBC error handling, and integration testing. One major challenge was adapting unit tests to handle persistent state while making sure that invalid data could not corrupt the database. This experience helped to improve my ability to design secure and testable systems.