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CS499 Computer Science Capstone

**Narrative for Artifact 1: Software Design & Engineering (CS 320 - ContactService.java)**

**Brief Description:** This artifact is a Java-based contact manager CLI application that was initially developed during CS 320. It allows users to create, update, and delete contacts. The original implementation lacked modular design and had limited input validation and testing.

**Justification for Inclusion:** I included this project in my portfolio because it demonstrates my ability to apply object-oriented principles and software design methodologies. The enhancements made showcase improvements in code modularity, test coverage with JUnit, and robustness through exception handling. This artifact provides tangible evidence of my understanding of software architecture and maintainable code.

**Reflection on Enhancement:** During the enhancement process, I modularized the logic into separate service and data model classes, added JUnit test cases, and implemented input validation to prevent runtime errors. I learned how clean design patterns make code easier to scale and maintain. One of the challenges I faced was designing reusable test cases that covered edge conditions. Feedback from my instructor prompted me to make the methods more testable by refactoring them to return data rather than relying on side effects. These improvements helped me better meet outcomes related to software engineering principles and secure, maintainable code design.