Individual Contribution Report

CMPE 321 – Database Systems

Project 4: Dune Archive System

1 Personal Information

- **Name:** Bora Depecik
- **Student ID:** 2020400105
- **Group Number:** Team with Ali Ayhan Günder (2021400219)

2 Contributions

Testing & Quality Assurance: I developed comprehensive testing strategies and executed extensive test cases to validate system functionality. This included creating edge case scenarios, validating Q&A compliance requirements, and performing end-to-end testing of all database operations. I designed test inputs to verify duplicate detection, type validation, and error handling mechanisms.

Documentation & User Experience: I created and refined the README.md documentation, ensuring clear usage instructions and troubleshooting guides for end users. I also contributed to the project report structure, focusing on the testing and validation sections, performance analysis, and Q&A compliance documentation.

Code Optimization & Refinement: I worked on optimizing the record management operations, particularly focusing on the search and delete functionalities. I enhanced the bitmap slot management logic and contributed to improving memory efficiency through better page utilization calculations and boundary checking mechanisms.

Integration & System Validation: I handled the integration testing between different system components, ensuring seamless interaction between catalog management, page operations, and command processing. I validated file I/O operations and helped establish the final system parameters for optimal performance.

3 Teamwork

Collaboration Methods: We maintained constant communication through WhatsApp for quick coordination and held structured discussions via Google Meet for complex design decisions. I organized testing sessions and provided detailed feedback on implementation approaches.

Division of Responsibilities: While Ali focused on the core engine implementation and error handling architecture, I concentrated on testing, documentation, and system optimization. I took responsibility for validating Q&A requirements and ensuring the final system met all project specifications.

Review & Feedback Process: I conducted thorough code reviews, identifying potential issues and suggesting improvements. My testing approach helped uncover edge cases that led to more robust error handling and validation improvements.

4 Self-Reflection

Learning Experience: This project enhanced my understanding of database testing methodologies and the importance of comprehensive validation in database systems. I gained valuable experience in technical documentation and learned how proper testing strategies are crucial for system reliability.

Skills Improved:

- **Software Testing:** Systematic test case design and edge case identification
- **Technical Documentation:** Clear communication of complex technical concepts
- **System Integration:** Understanding component interactions and dependencies
- **Performance Analysis:** Evaluating system efficiency and optimization opportunities
- **Quality Assurance:** Ensuring compliance with specifications and requirements

Technical Growth: I developed a deeper appreciation for the testing phase of software development and learned how critical proper documentation is for system usability. The project taught me the importance of systematic validation and how thorough testing prevents issues in production environments.

Challenges Overcome: The most challenging aspect was designing comprehensive test cases that covered all possible edge scenarios while ensuring Q&A compliance. Learning to balance thorough testing with project timelines required careful planning and prioritization of critical test scenarios.