(Abstract)

Design and Implementation of an Airbnb Database Management System

Project Overview

This project represents a comprehensive relational database management system (DBMS) designed to handle core Airbnb-like operations, including user management, property listings, bookings, payments, and reviews. The system consists of 26 interconnected tables, demonstrating robust data handling and referential integrity.

Technical Implementation

Database Design:

Implemented 26 normalized tables with proper relationships and constraints, using the InnoDB storage engine and UTF-8 (utf8mb4) encoding for international character support.

Key Features:

- Multi-role user management for hosts, guests, and administrators.
- Sophisticated booking and payment processing with platform payment retention.
- Comprehensive house rules management using Many-to-Many junction tables.
- Recursive relationships for referral tracking and dynamic availability tracking.

System Metadata

Database Statistics

- Total Tables: 26
- Total Records: 520+ (minimum 20 entries per table)
- Database Size: Approximately 0.94 MB
- Primary Tables:
    - User Management: User, HostProfile, GuestProfile, Admin
    - Property Management: Accommodation, Amenities, Location
    - Transaction Management: Booking, Payment, Commission

    - Support Features: Review, Rating, Message, HouseRules

Core Functionalities

- Triple relationships for complex data associations.
- Junction tables for Many-to-Many relationships (e.g., HouseRules to Accommodations).
- Recursive referral tracking and integrated review systems.
- Advanced commission calculation and payment distribution.

System Integration

- Triple relationship implementation
- Recursive relationships for referral tracking
- Complex booking management with status tracking
- Platform payment holding system with 24-hour post-check-in retention for guest satisfaction
- Comprehensive house rules management through junction tables

Outcome

The system successfully demonstrates both technical sophistication and practical utility, making it suitable for real-world deployment with minimal modifications.