Abstract:

The Airbnb database schema is a comprehensive structure designed to manage various aspects of the Airbnb platform.

Key features of the system:

User Management: The database facilitates the registration and management of users, including guests, hosts, and employees.

Property Listings: Places available for rent are managed through the database. Hosts can list their places, and guests can browse and book them.

Reservation Handling: The database handles reservations made by guests. Reservations are linked to specific listings and guests.

Review System: Guests can submit reviews for properties they have stayed in.

Payment Processing: Payment transactions are recorded in the database.

Income Tracking: The system tracks income generated through reservations, providing insights into revenue generation for hosts and the platform as a whole.

Complaint Management: Users can create complaints regarding their experiences on the platform.

Notification System: The database handles notifications sent to users.

The design process followed a structured approach that included several stages:

1. Requirements Gathering: Once the key entities were identified, requirements were collected for each entity, and their relationships, and then constraints were defined accordingly.
2. Conceptual Design: An Entity-Relationship Diagram was created to represent the high-level structure of the database.
3. Logical Design: The conceptual design was translated into a logical schema. The schema was normalized to minimize redundancy and improve data integrity.
4. Physical Design: The database schema was created in MySQL. The entities, attributes, data types, constraints, and indexes for each table were defined in the schema. Mock data was added to the tables.

With 20 tables, each with specific attributes and relationships, this schema forms the backbone of the Airbnb platform, enabling seamless operations and providing valuable insights into user behavior and property management.

The schema begins with essential entities such as users, including guests and hosts. Each user is uniquely identified by an ID and possesses attributes such as first name, last name, email, password, contact number, and profile image. Users are further categorized into roles, with distinct roles defined to differentiate between guests and hosts.

Accommodations, represented by the place table, form the core of the Airbnb platform. Each place has a unique id and is associated with a location, which includes details such as the country, region, city, street, and postal code. Additional attributes describe the accommodation, such as the number of rooms, maximum guest capacity, price per night, and a description.

The listing table connects accommodations to the Airbnb platform, providing a platform for hosts to showcase their properties. It includes a description of the listing and references to cover photos stored in the media table.

Amenities offered by accommodations are captured in the amenities table, providing users with information about the facilities available at each place. The amenity_listing table establishes a many-to-many relationship between amenities and listings, allowing multiple amenities to be associated with each accommodation.

Reservations, essential for booking accommodations, are managed through the reservation table. Each reservation is uniquely identified by an id and includes details such as the listing id, check-in and check-out dates, and references to payments made for the reservation.

The payment table records payment transactions associated with reservations. Details such as the payment date, amount, currency, discount, and payment method are stored, facilitating secure and efficient payment processing.

Reviews and complaints, captured in the review and complaint tables, provide valuable feedback for hosts and insights into user experiences. Reviews include ratings and comments, while complaints record detailed explanations and statuses.

Employee management is facilitated through the employee table, capturing details such as employee ID, birthdate, hire date, job title, annual leave, and reporting structure.

Financial aspects of hosting are tracked through the income table, recording income generated from accommodations, including details such as the year and amount.

The user's language preferences are stored in the language table, facilitating multilingual support for the platform.

The location table provides geographical information about places, allowing users to search for accommodations based on specific regions and cities.

User notifications are captured in the notification table, including notification details such as the message and time.

Conclusion

With these tables interconnected through various foreign key relationships, the Airbnb database schema efficiently manages the complexities of the platform, ensuring smooth operations, secure transactions, and a seamless user experience.