Database for storing and processing information regarding the Airbnb use case

Conception phase

DLBDSPBDM01 - Project: Build a Data Mart in SQL

B.Sc. Data science

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1. Project goals

This project will create a database containing data about an online reservation and rental application. Both guests and hosts will have the opportunity to make use of this application. Through the platform, hosts have the option of listing their properties for rent, and they define the property amenities. In addition, guests should be able to choose the rental property they prefer based on features, location, date, availability, and customer reviews. By developing a relational database with MySQL, we attempt to form a relationship between all entities and attributes required to manage a booking and reservation system.

2. Requirements specification

- What roles (person/user groups) are there?

This platform comprises three distinct roles. Guests, Hosts, and Airbnb

Guests are willing to locate the best resort to spend their vacation. Also, hosts offer their facilities as accommodations to their guests. These groups are considered distinct types of users. However, each host can be a guest itself, so we decided to divide hosts from the “user” table with a table called “user_type” to grant their permissions and roles on the application side.

Airbnb indeed is a type of user group in this system that handles the transactional data and acts as a middleman between guest and host to facilitate their interaction. The system administrators and employees of this company must be able to access the required data from the database with the help of their role-based access control system. However, there is no table in Datamart to store the data of Airbnb admins since the operational level company systems should grant their access.

- What actions do these roles perform?

Guests: each guest can capture any details that unit owners provide about their properties. Also, there should be an easy process to filter the search results based on guest preference for booking accommodation.

Hosts: Each host will sign up in the system as a user who can post details about their residential properties and provide necessary information to attract guests to book their room as accommodation for their vacation. Hosts also needed to provide their user account info such as profile picture, contact info, bank account, etc.

Airbnb: Several tables store the transactional data of registered properties, booking, and transactions, user reviews, promo codes, etc., which are required to operate user requests and provide a rental service. The Airbnb application is supposed to use this database to facilitate user interactions.

- Which data and functions are required?

Platform interactions are heavily dependent upon properties. The platform must establish several specific rules to define each property's details. We may identify properties by their name, address, price per night, service charges, maximum numbers of guests allowed, available dates, the number of bedrooms and bathrooms, and start and end of service dates.

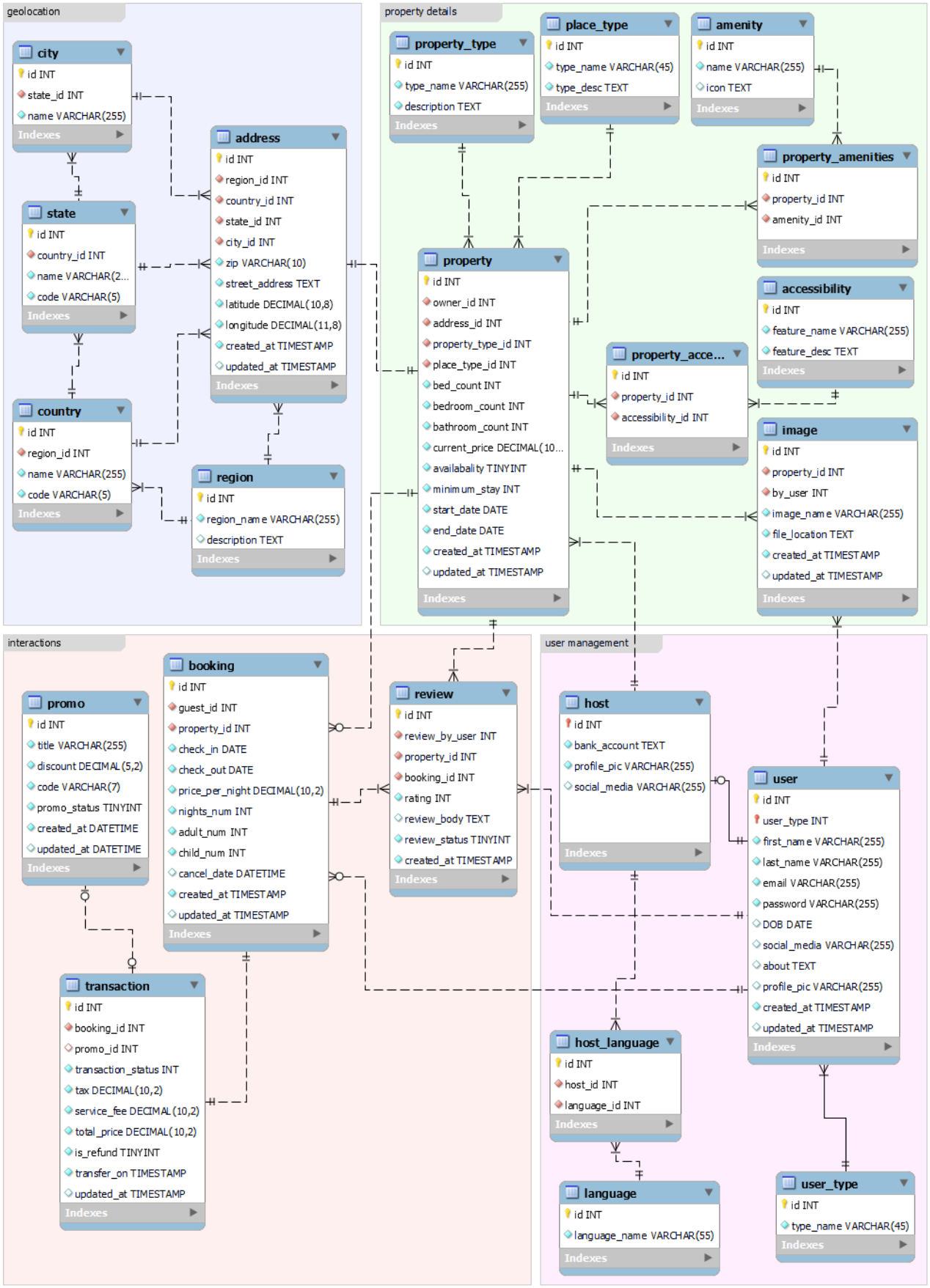
Hosts should have been allowed to upload some images for their properties. They should clarify their bank account to receive funds from the platform. Also, they may connect their account to their social media account to show their ratings and promote their accommodation. In addition, they can indicate how many languages they can speak.

Users may need to narrow their search results for accommodation based on specific criteria. Like location, the number of rooms, place type, room type, accessibility features, and property amenities. Hosts and guests must be able to rate each other based on their booking experience.

Additionally, we should apply a set of rules to users. As a result, every user must register an account with some required information. Each user account has a unique ID and their first and last name, email address, password, profile picture, and phone number.

Bookings and transactions are essentials of this platform. The Airbnb application operates them, so they must include which properties will be booked, how many guests are accepted, what is the price per night for that booking, when the guests can check in and check out, and the booking status. Also, when a transaction has happened, the application should clarify the tax, discount, and service amount. Users may have some promo codes, and they should have been able to use their codes to receive discounts on their bookings.

3. ER Diagram


geolocation
city
id INT
state_id INT
name VARCHAR(255)
Indexes
state
id INT
country_id INT
name VARCHAR(2...
code VARCHAR(5)
Indexes
country
id INT
region_id INT
name VARCHAR(255)
code VARCHAR(5)
Indexes
address
id INT
region_id INT
country_id INT
state_id INT
city_id INT
zip VARCHAR(10)
street_address TEXT
latitude DECIMAL(10,8)
longitude DECIMAL(11,8)
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
region
id INT
region_name VARCHAR(255)
description TEXT
Indexes
property details
property_type
id INT
type_name VARCHAR(255)
description TEXT
Indexes
place_type
id INT
type_name VARCHAR(45)
type_desc TEXT
Indexes
amenity
id INT
name VARCHAR(255)
icon TEXT
Indexes
property_amenities
id INT
property_id INT
amenity_id INT
Indexes
property
id INT
owner_id INT
address_id INT
property_type_id INT
place_type_id INT
bed_count INT
bedroom_count INT
bathroom_count INT
current_price DECIMAL(10...
availability TINYINT
minimum_stay INT
start_date DATE
end_date DATE
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
property_acce...
id INT
property_id INT
accessibility_id INT
Indexes
accessibility
id INT
feature_name VARCHAR(255)
feature_desc TEXT
Indexes
image
id INT
property_id INT
by_user INT
image_name VARCHAR(255)
file_location TEXT
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
interactions
booking
id INT
guest_id INT
property_id INT
check_in DATE
check_out DATE
price_per_night DECIMAL(10,2)
nights_num INT
adult_num INT
child_num INT
cancel_date DATETIME
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
promo
id INT
title VARCHAR(255)
discount DECIMAL(5,2)
code VARCHAR(7)
promo_status TINYINT
created_at DATETIME
updated_at DATETIME
Indexes
review
id INT
review_by_user INT
property_id INT
booking_id INT
rating INT
review_body TEXT
review_status TINYINT
created_at TIMESTAMP
Indexes
transaction
id INT
booking_id INT
promo_id INT
transaction_status INT
tax DECIMAL(10,2)
service_fee DECIMAL(10,2)
total_price DECIMAL(10,2)
is_refund TINYINT
transfer_on TIMESTAMP
updated_at TIMESTAMP
Indexes
user management
host
id INT
bank_account TEXT
profile_pic VARCHAR(255)
social_media VARCHAR(255)
Indexes
user
id INT
user_type INT
first_name VARCHAR(255)
last_name VARCHAR(255)
email VARCHAR(255)
password VARCHAR(255)
DOB DATE
social_media VARCHAR(255)
about TEXT
profile_pic VARCHAR(255)
created_at TIMESTAMP
updated_at TIMESTAMP
Indexes
host_language
id INT
host_id INT
language_id INT
Indexes
language
id INT
language_name VARCHAR(55)
Indexes
user_type
id INT
type_name VARCHAR(45)
Indexes

DatamartProject
Data Dictionary

2022-08-19

Index

accessibility

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓	✓				✓		
feature_name	VARCHAR(255)			✓							title of accessibility feature
feature_desc	TEXT			✓							

address

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
region_id	INT		✓	✓							
country_id	INT		✓	✓							
state_id	INT		✓	✓							
city_id	INT		✓	✓							
zip	VARCHAR(10)			✓							zip code for the address
street_address	TEXT			✓							full address of the property
latitude	DECIMAL(10,8)			✓							

longitude	DECIMAL(11,8)			✓							
created_at	TIMESTAMP			✓						CURRENT_TIMESTAMP	
updated_at	TIMESTAMP									NULL	

amenity

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
name	VARCHAR(255)			✓							title of each amenity
icon	TEXT										tiny icon to show beside each amenity

booking

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
guest_id	INT		✓	✓							
property_id	INT		✓	✓							
check_in	DATE			✓							when guests will check in
check_out	DATE			✓							when guests will check out
price_per_night	DECIMAL(10,2)			✓							price needed to pay for each staying nights
nights_num	INT			✓							number of stayng nights
adult_num	INT			✓							number of adult guests
child_num	INT			✓							number of child guests
cancel_date	DATETIME									NULL	date of canceling if happens
created_at	TIMESTAMP			✓						CURRENT_TIMESTAMP	
updated_at	TIMESTAMP									NULL	

city

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
state_id	INT		✓	✓							
name	VARCHAR(255)			✓							name of the cities

country

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
region_id	INT		✓	✓							
name	VARCHAR(255)			✓							name of the countries
code	VARCHAR(5)			✓							each country phone code

host

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓	✓	✓	✓						
bank_account	TEXT			✓							IBAN
profile_pic	VARCHAR(255)			✓							profile picture is necessary for hosts
social_media	VARCHAR(255)										url of social media account

host_language

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓	✓				✓		
host_id	INT		✓	✓							
language_id	INT		✓	✓							

image

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
property_id	INT		✓	✓							

by_user	INT		✓	✓							
image_name	VARCHAR(255)			✓							title for the image
file_location	TEXT			✓							url of where the file has been stored
created_at	TIMESTAMP			✓						CURRENT_TIMESTAMP	
updated_at	TIMESTAMP									NULL	

language

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓	✓				✓		
language_name	VARCHAR(55)			✓							list of languages

place_type

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓	✓				✓		
type_name	VARCHAR(45)			✓							type of the place
type_desc	TEXT			✓							describing each place type

promo

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
title	VARCHAR(255)			✓							title of promo code
discount	DECIMAL(5,2)			✓							discount percent for code
code	VARCHAR(7)			✓							generated code
promo_status	TINYINT			✓							status of code
created_at	DATETIME			✓						CURRENT_TIMESTAMP	
updated_at	DATETIME									NULL	

property

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
owner_id	INT		✓	✓							
address_id	INT		✓	✓							
property_type_id	INT		✓	✓							
place_type_id	INT		✓	✓							
bed_count	INT			✓							number of beds
bedroom_count	INT			✓							number of bedrooms
bathroom_count	INT			✓							number of bathrooms
current_price	DECIMAL(10,2)			✓							the current price of property which may differ over time
availability	TINYINT			✓							clarifying availability of the property
minimum_stay	INT			✓							minimum number of staying nights
start_date	DATE			✓							the first date when property is available for booking
end_date	DATE			✓							the last date when property is available for booking
created_at	TIMESTAMP			✓						CURRENT_TIMESTAMP	
updated_at	TIMESTAMP									NULL	

property_accessibility

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓	✓				✓		
property_id	INT		✓	✓							
accessibility_id	INT		✓	✓							

property_amenities

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
property_id	INT		✓	✓							
amenity_id	INT		✓	✓							

property_type

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
type_name	VARCHAR(255)			✓							type of the property
description	TEXT			✓							describing each type

region

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
region_name	VARCHAR(255)			✓							name of the regions
description	TEXT										brief description for regions

review

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
review_by_user	INT		✓	✓							
property_id	INT		✓	✓							
booking_id	INT		✓	✓							
rating	INT			✓							rating with 5 stars
review_body	TEXT										text body for ratings
review_status	TINYINT			✓							is review published or not
created_at	TIMESTAMP			✓						CURRENT_TIMESTAMP	

state

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
country_id	INT		✓	✓							
name	VARCHAR(255)			✓							name of the states
code	VARCHAR(5)			✓							each state phone code

transaction

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
booking_id	INT		✓	✓							
promo_id	INT		✓								
transaction_status	INT			✓							status of transaction
tax	DECIMAL(10,2)			✓							tax amount
service_fee	DECIMAL(10,2)			✓							fee of platform
total_price	DECIMAL(10,2)			✓							total price that has been paid
is_refund	TINYINT			✓							is the transaction been refunded or not
transfer_on	TIMESTAMP			✓							transaction exact time
updated_at	TIMESTAMP									NULL	

user

Column name	DataType	PK	FK	NN	UQ	BIN	UN	ZF	AI	Default	Comment
id	INT	✓		✓					✓		
user_type	INT	✓	✓	✓							
first_name	VARCHAR(255)			✓							first name of registered user
last_name	VARCHAR(255)			✓							last name of registered user
email	VARCHAR(255)			✓							email of registered user

password	VARCHAR(255)			✓							hash of the account password
DOB	DATE										date of birthday
social_media	VARCHAR(255)										social media account url
about	TEXT										user interests and biography
profile_pic	VARCHAR(255)										url of profile picture
created_at	TIMESTAMP			✓						CURRENT_TIMESTAMP	
updated_at	TIMESTAMP									NULL	

user_type

Column name	**DataType**	**PK**	**FK**	**NN**	**UQ**	**BIN**	**UN**	**ZF**	**AI**	**Default**	**Comment**
id	INT	✓		✓	✓				✓		
type_name	VARCHAR(45)			✓							type of users in platform