Domain: Real-Estate Management

Description:

This following schema represents database of a real-estate management company which facilitates property transactions by connecting property owners with potential clients for purchase or rental. They allocate agents to market properties, arrange viewings, negotiate terms, and carry out the transaction process. The company also carries out maintenance and repairs of the property on behalf of their owners if required by them.

There are total of 13 entities in this schema and each entity have 1000 rows. The attributes with asterisks mark (*) have missing values in them which are to be treated (mostly) by filling them up through interpolation, KNN imputer particularly.

Entities & Attributes:

Client
// This table stores the information about the clients who are interested in buying or renting a property
client_id (PK)
client_name
client_gender*
client_phone
client_email
client_dob
address_id (FK to Address)

Agent
// This table stores details of property agents or brokers
agent_id (PK)
agent_name
agent_gender
agent_phone
agent_email
agent_dob
address_id (FK to Address)
hire_date
title

Owner
// This table stores the details of property owners
owner_id (PK)
owner_name

owner_gender
owner_phone
owner_email
owner_dob
address_id (FK to Address)

Property

// This table stores the primary details of the property and which agent manages it

property_id (PK)
address_id (FK to Address)
owner_id (FK to Owner)
agent_id (FK to Agent)
feature_id (FK to Features)
listing_date
listing_type*
asking_amount*

Features

// This table stores the features of a property

feature_id (PK)
lot_area_sqft
no_bedrooms*
no_bathrooms
no_kitchens
no_floors
parking_area_sqft*
year_built
condition_rating

Maintenance

// This table stores information about maintenance and repairs carried out for a certain property

maintenance_id (PK)
property_id (FK to Property)
maintenance_date
maintenance_type*
cost
description

Address

// This table stores address information of properties, clients, agents, and owners

address_id	(PK)
street_address	
city	
state	
zip_code*	
latitude	
longitude	

Visit

// This table stores the details of a property visit by a client with an agent

visit_id	(PK)
visit_date	
property_id	(FK to Property)
client_id	(FK to Client)
description	

Sale

// This table stores the details of sales transaction of a property

sale_id	(PK)
sale_date	
client_id	(FK to Client)
property_id	(FK to Property)
commission_id	(FK to Commission)
sale_amount	

Rent

// This table stores the details of rental transaction of a property

rent_id	(PK)
agreement_date	
rent_start_date	
rent_end_date	
rent_amount*	
client_id	(FK to Client)
property_id	(FK to Property)
commission_id	(FK to Commission)
contract_id	(FK to Contract)

Contract
// This table stores the details of rental agreement terms for a rental transaction
contract_id (PK)
contract_terms

Commission
// This table stores the details of commission payment generated through rental or sales transaction
commission_id (PK)
commission_rate*
commission_amount
payment_method
payment_date

Admin
// This table stores the details of database system management team
admin_id (PK)
admin_name
username
password

Assumptions:

- The schema assumes that one address can be associated with multiple entities (clients, agents, owners) but each client, agent, and owner can only have one address. One property can only have one address and one address can only have one property. Owner and property might share same address.
- It assumes that a client is made after a visit and a transaction can only be conducted after a visit.
- The schema also assumes that each property is owned by exactly one owner and exactly one agent manages it. An agent, however, can manage multiple properties. Each visit, sale, and rent are associated with exactly one client, one agent, and one property. A property may or may not be visited.
- The maintenance of the property, if required, is also managed by the same allotted agent and maintenance cost is handled by the owner directly. The company only hires the service and get repairs done and then forwards the receipt of it to the owner.
- Additionally, it assumes that each sale or rent transaction can have only one commission associated with it which is paid by owner.
- It assumes that each contract is associated with only one rent transaction.
- The Real Estate Management Company only operates in one country.

Our DB is in at least 3NF:

- All attributes in each entity depend on the entities' respective primary key.
- In the listed entities, there doesn't seem to be any clear indication of partial dependencies, where non-key attributes depend on only a part of the primary key.
- There's no transitive dependencies present in the entities either as no non-prime attribute is dependent on another non-prime attribute. Given the above two conditions, this implies that all non-prime attributes are dependent on primary key only.

Missing Values:

Attribute	Entity	Missing Percentage
client_gender	Client	3%
zip_code	Address	8%
no_bedrooms	Features	8%
parking_area_sqft	Features	9%
listing_type	Property	14%
asking_amount	Property	7%
maintenance_type	Maintenance	8%
commission_rate	Commission	6%
rent_amount	Rent	5%