DAMG 6210

Data Management and Database Design

Team No: 1

Project Name: Rental Property Management system

Course name: DAMG 6210 Data Management and Database Design

Year: Fall 2021

Team Members:

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Objectives:

- To develop an efficient database system which eases the process of rental management
- To build a data source for performing analytics
- Maintain records for apartment details to keep track of availability
- Analyze overdues, early payment and accordingly inform the tenants
- To track the profit margin using revenue generated and expenditure

Problem Statement:

In this fast-paced world, with so many ways to generate data, it is very essential the data being generated is collected and managed in a structured manner so that it can be converted into useful information. Storing such an enormous amount of data is a cause of concern for many stakeholders. Such problems are faced even by real estate firms where they have multiple customers looking for rental housing. Thus, it requires a robust database management system that facilitates connecting the customers with the appropriate property that suits their needs. The firms have multiple customers approaching to search for a rental property and storing their data and analyzing it accurately can help them gain revenues. This can only be possible if they have an organized process where the data is stored appropriately. The aim of our system is to design such a model that can help the organization to manage all the customers who are on lease or searching for a property along with keeping the track of organization's profit and has a hassle-free experience.

PROPOSED SOLUTION:

- Using **MIN_AMOUNT** and **MAX_AMOUNT,** availability of the apartment can be shown to customers as per their budget preferences.

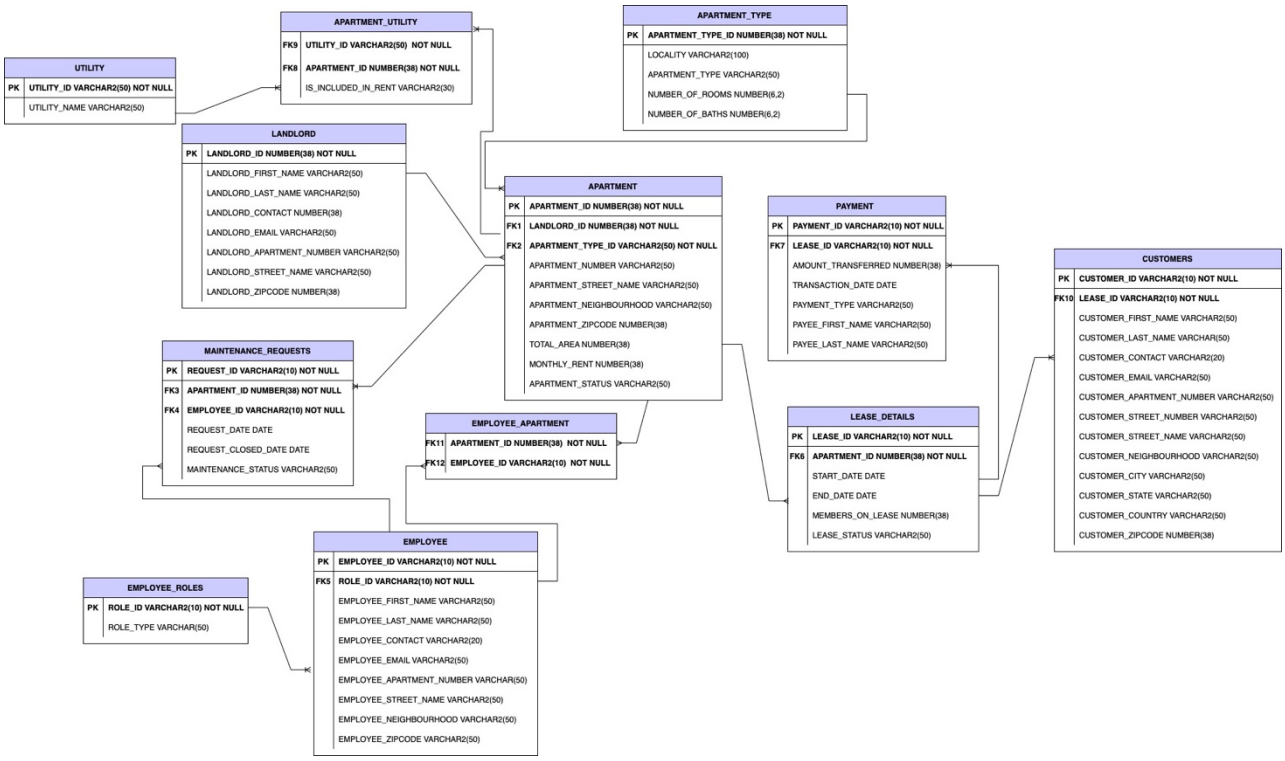
- To know about utilities included in rent for each apartment, we are using association entity **APARTMENT_UTILITY** having **PRIMARY KEY (APARTMENT_ID, UTILITY_ID)** which connects **APARTMENT** and **UTILITY** entity

- For each apartment in **APARTMENT** entity, there is a **LEASE_ID** associated through which we can find the current tenants from the CUSTOMER entity using **FOREIGN KEY(LEASE_ID)**. This can further help to track the payments using **FOREIGN KEY (LEASE_ID)** in **PAYMENT** entity

- Each landlord can view the current tenants living in associated apartments by creating **VIEWS** using **APARTMENT-> LEASE_DETAILS-> CUSTOMER** relationship

- Tracking the maintenance required for each apartment we are using **FOREIGN KEY APARTMENT_ID** in **MAINTENANCE_REQUESTS** entity

ENTITY-RELATIONSHIP DIAGRAM



APARTMENT ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
APARTMENT_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
ADDRESS	VARCHAR (50)	NOT NULL
TOTAL_AREA	INTEGER (10)	NOT NULL
MONTHLY_RENT	INTEGER (10)	NOT NULL
EMPLOYEE_ID	INTEGER (10)	FOREIGN KEY which references EMPLOYEE_ID from EMPLOYEE entity. This is used to fetch the details of assigned employee.
LANDLORD_ID	INTEGER (10)	FOREIGN KEY which references LANDLORD_ID from LANDLORD entity. This is used to fetch the details of landlord.
APARTMENT_TYPE_ID	INTEGER (10)	FOREIGN KEY which references APARTMENT_ID from APARTMENT entity. This is used to fetch the details of apartments.

LANDLORD ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
LANDLORD_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
LANDLORD_NAME	VARCHAR (50)	NOT NULL
LANDLORD_CONTACT	INTEGER (10)	NOT NULL, UNIQUE
LANDLORD_EMAIL	VARCHAR (50)	NOT NULL, UNIQUE

EMPLOYEE ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
EMPLOYEE_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
EMPLOYEE_NAME	VARCHAR (50)	NOT NULL
EMPLOYEE_CONTACT	INTEGER (10)	NOT NULL, UNIQUE
EMPLOYEE_EMAIL	VARCHAR (50)	NOT NULL, UNIQUE
EMPLOYEE_ADDRESS	VARCHAR (50)	NOT NULL
ROLE_ID	INTEGER (10)	FOREIGN KEY which references ROLE_ID from EMPLOYEE_ROLES entity. This is used to fetch the details of employee roles.

EMPLOYEE_ROLES ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
ROLE_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
ROLE_TYPE	VARCHAR (50)	NOT NULL

APARTMENT_UTILITY ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
IS_INCLUDED_IN_RENT	VARCHAR (50)	NOT NULL
APARTMENT_ID	INTEGER (10)	FOREIGN KEY which references APARTMENT_ID from APARTMENT entity. This is used to fetch the details of apartments.

UTILITY_ID	INTEGER (10)	FOREIGN KEY which references UTILITY_ID from UTILITY entity. This is used to fetch the details of apartment utilities.

UTILITY ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
UTILITY_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
UTILITY_NAME	VARCHAR (50)	NOT NULL

MAINTENANCE_REQUESTS ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
REQUEST_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
REQUEST_DATE	DATE	NOT NULL
REQUEST_CLOSED_DATE	DATE	NOT NULL
APARTMENT_ID	INTEGER (10)	FOREIGN KEY which references APARTMENT_ID from APARTMENT entity. This is used to fetch the details of apartments.

LEASE_DETAILS ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
LEASE_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
START_DATE	DATE	NOT NULL
END_DATE	DATE	NOT NULL
MEMBERS_ON_LEASE	INTEGER (10)	NOT NULL
APARTMENT_ID	INTEGER (10)	FOREIGN KEY which references APARTMENT_ID from APARTMENT entity. This is used to fetch the details of apartments.

CUSTOMER ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
CUSTOMER_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
CUSTOMER_NAME	VARCHAR (50)	NOT NULL
CUSTOMER_CONTACT	INTEGER (10)	NOT NULL, UNIQUE
LEASE_ID	INTEGER (10)	FOREIGN KEY which references LEASE_ID from LEASE_DETAILS. This is used to fetch the details of lease.

PAYMENT ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
PAYMENT_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
PAYMENT_TYPE	VARCHAR (50)	NOT NULL
TRANSACTION_DATE	DATE	NOT NULL
AMOUNT_TRANSFERRED	INTEGER (10)	NOT NULL
CUSTOMER_ID	INTEGER (10)	FOREIGN KEY which references CUSTOMER_ID from CUSTOMER. This is used to fetch the details of customers.

APARTMENT_TYPE ENTITY

ATTRIBUTES	DOMAIN	COMMENTS
APARTMENT_TYPE_ID	INTEGER (10)	NOT NULL, PRIMARY KEY
LOCALITY	VARCHAR (50)	NOT NULL
APARTMENT_TYPE	VARCHAR (50)	NOT NULL
NO_OF_ROOMS	INTEGER (10)	NOT NULL

BUSINESS RULES:

- **Employee** can check the **availability** of **one or more rooms** according to **customer preferences**
- **Each landlord** can check the number of **apartments** he/she is leasing
- **Each landlord** can check the details of **one or more tenants** associated with **one or more apartments**
- **Each landlord** can keep a track on **one or more apartment's rent** under him/her
- **Employee** can track **history of lease details** for **every apartment** for **each year** using **Lease_Details** entity
- **Employee** can keep a check on whether the **payment** for a **particular month** for an **apartment** is done or not with the help of **Payment entity** based on the **transaction date**
- **Employee** can manage **multiple apartments**
- Once the **apartment** has been rented, the **customer** is assigned **lease_id**
- **Customer** can keep a track on their **payment dues**
- **Each payment** can belong to **one or more tenants** but **only one lease_id**
- **One booking** can only be processed by **one payment_id**
- **Each customer** can choose the **apartment** according to their **preferences** based on **locality and budget**
- **Each apartment** can have **multiple utilities** which **may or may not be included in rent**
- **Employee** can view and manage **maintenance requests**
- Once the **lease date** is assigned to a **customer,** the **status** of the **apartment is changed accordingly**
- According to **maintenance request closed date,** maintenance **status** can be tracked

SECURITY CONSTRAINTS: (USER LEVEL/PERMISSIONS)

ADMIN:

1. Has full access i.e., READ/WRITE/UPDATE all the entities in the database

MANAGER:

1. Has read access for all the entities in the database.
2. Has UPDATE access to customer, lease, payment, and maintenance requests.