

Roommate and Accommodation Finding System

1. Introduction

The current file consists of the database design pertaining for the Roommate and accommodation finding system, mainly focused to optimize the comprehensive accommodation and roommates searching and finding system as a breakthrough, especially for International students. Consisting of varied numbers of filters, searches, preferences for finding a roommate as well as an accommodation to one's needs. Moreover, the system also consists of lease details, owner identification and authentication, broker identification and authentication, property management, various communication mediums, wishlist for accommodation, and other housing capabilities and options.

2. Business Problem Addressed

The design of the database is streamlined for better optimization and solve key user challenges:

- **Search Filter for Better Decision Making:** Helps users for better decision making after setting the preferences for the desired accommodation and roommates.
- **Authentication and Reliability:** The system addresses the issues of authenticity and reliability with the help of predefined real-time data of owner, property management, etc which increases the reliability of the system and makes it more authentic.
- **Roommates Grouping:** Facilitates the problem of identifying students with similar preferences, streamlining the process of finding compatible housemates, and simplifying the housing search.
- **System Dependency:** Having to look out for every utility for accommodation through various websites this system will consist of all the verified brokers and budget-friendly accommodation.
- **In-person Visit:** International students face the issue of the real-time housing visit to verify the accommodation.
- **Verified Brokers and Management:** This problem is also faced by many international students as they apply on various sites for their housing and never get any response.
- **Commute:** Nonlocals have no nearby mode for their means of commute.
- **Level of Area-Safety:** This is also a problem faced by nonlocal students as they don't know the safety of the specific area they are living in.

3. Entities Description

3.1 Roommates

- Attributes: Person ID (PK), Username, Password, Full Name, Email, Phone no, Age, Address, Gender, Languages, Work Exp, Food Habit, Cleanliness Habit, Cooking skills, Hobbies, Personality, Account Creation Date
- Relationships: Part of Roommate Group, Has Preferences, Creates Wishlist, Submits Application

3.2 Roommate Group

- Attributes: (Person ID) (FK), RG ID (PK), rent split, roommate agreement, renters insurance
- Relationships: Consists of Roommates, Looks at Property

3.3 Property

- Attributes: Property ID (PK), Address, Property Rent, No. of beds, No. of baths, Kitchen Appliances, Facilities Included
- Relationships: Owned by Owner, Looked at by Roommate Group, Has Lease Details

3.4 Owner

- Attributes: Owner ID (PK), Property ID (FK), Name, No of Properties, Contact Mail, Office Hours
- Relationships: Owns Property, Has Communication, Can be Self or Broker

3.5 Broker

- Attributes: Broker ID (PK), No of properties managed, License Number
- Relationships: Is a type of Owner

3.6 Application Submission

- Attributes: application ID (PK), application status, application date, Property ID (FK)
- Relationships: Submitted by Roommates, Associated with Property

3.7 Bank Details

- Attributes: account ID (PK), routing number, bank name, bank address
- Relationships: Associated with Application Submission

3.8 Communication

- Attributes: Communication ID (PK), Date of Communication, Description, type
- Relationships: Associated with the Owner, Can be Complaints or Transactions

3.9 Complaints

- Attributes: date, category of resolution
- Relationships: Is a type of Communication

3.10 Transactions

- Attributes: transaction ID (PK), amount, sent by account no, received by account no
- Relationships: Is a type of Communication

3.11 Preferences

- Attributes: preferences ID (PK), room type, no of roommates, apartment type, roommate age, roommate gender, roommate course, roommate food habits, roommate cleanliness habits, roommate other habits, rent range, apartment area
- Relationships: Set by Roommates

3.12 Wishlist

- Attributes: wishlist id (PK), property id (FK)
- Relationships: Created by Roommates

3.13 Lease Details

- Attributes: Lease ID (PK), Property ID (FK), Lease sign date, total rent, monthly rent, lease start date, lease end date, move-in cost
- Relationships: Associated with Property

4. ENTITY RELATIONS

4.1 Roommates

- **Roommate Group:** Many-to-Many (A roommate can be part of multiple roommate groups, and a group can consist of multiple roommates).
- **Wishlist:** One-to-One (Each roommate can create only one wishlist linked to a single property).
- **Preferences:** One-to-One (A roommate can have one set of preferences).
- **Application Submission:** One-to-Many (A roommate can submit multiple applications)
- **Bank Details:** One-to-Many (A roommate can have multiple bank details associated with different application submissions).

4.2 Roommate Group

- **Roommates:** Many-to-Many (A roommate group can consist of multiple roommates, and a roommate can be part of multiple groups).
- **Property:** One-to-Many (A roommate group can look at multiple properties).

- **Wishlist:** One-to-One (Each roommate group can have only one associated wishlist).
- **Application Submission:** One-to-Many (A roommate group can submit multiple applications for different properties).

4.3 Property

- **Roommate Group:** Many-to-One (Multiple roommate groups can look at the same property).
- **Wishlist:** Many-to-Many (A property can appear on multiple wishlists).
- **Lease Details:** One-to-Many (Each property can have multiple lease details associated with it).
- **Owner:** Many-to-One (Multiple properties can be owned by a single owner).
- **Communication:** One-to-Many (A property can have multiple communication entries associated with it).
- **Application Submission:** One-to-Many (A property can have multiple applications submitted for it).

4.4 Owner

- **Property:** One-to-Many (An owner can own multiple properties).
- **Bank Details:** One-to-Many (An owner can have multiple bank details associated with different properties or transactions).

4.5 Broker & Self

- Its the subtypes of Owner. They are in total specialization with disjoint rule meaning the Owner has to belong to one these subtypes and can belong to only one category at a time.

4.6 Application Submission

- **Roommate Group:** Many-to-One (A roommate group can submit one or many applications).
- **Property:** Many-to-One (Multiple application submissions can be made for a single property).
- **Roommates:** Many-to-One (A roommate can submit many applications, and an application must be submitted by a roommate).

4.7 Bank Details

- **Roommates:** Many-to-One (Multiple bank details can be linked to a single roommate).
- **Owner:** Many-to-One (Multiple bank details can be linked to a single owner).

4.8 Communication

- **Property:** Many-to-One (Multiple communication entries can be linked to a single property).

4.9 Complaints & Transactions

- Its the subtypes of Communications. They are in total specialization with disjoint rule meaning the Communication has to belong to one these subtypes and can belong to only one category at a time.

4.10 Preferences

- **Roommate** : One-to-One (A Preference must be associated with a roommate).

4.11 Wishlist

- **Roommate Group**: One-to-One (Each wishlist is linked to one specific roommate group).
- **Property**: Many-to-Many (A wishlist can contain multiple properties, and a property can appear in multiple wishlists).
- **Roommate**: One-to-One (A wishlist can be associated with a roommate)

4.12 Lease Details

- **Property**: Many-to-One (Multiple lease details can be linked to a single property).

5. ER DIAGRAM

