

CSCC43 Project Report

Purpose of the Project

This project is to practice designing and implementing a database system, which solves a real world problem. Specifically a mock Airbnb app, see user manual for a detailed list of operations supported.

Conceptual Problems Encountered & Solutions

Problem1:

How to allow listing price and availability update without affecting already created bookings?

Each booking has an attribute price to record the price when the booking is made, and this value is fixed regardless future update of listing price;

Prior to updating availability, check if the new availability would affect unfinished bookings (i.e.time span of all unfinished bookings should be within the new availability)

Problem 2:

How to track current user id and if the user is host?

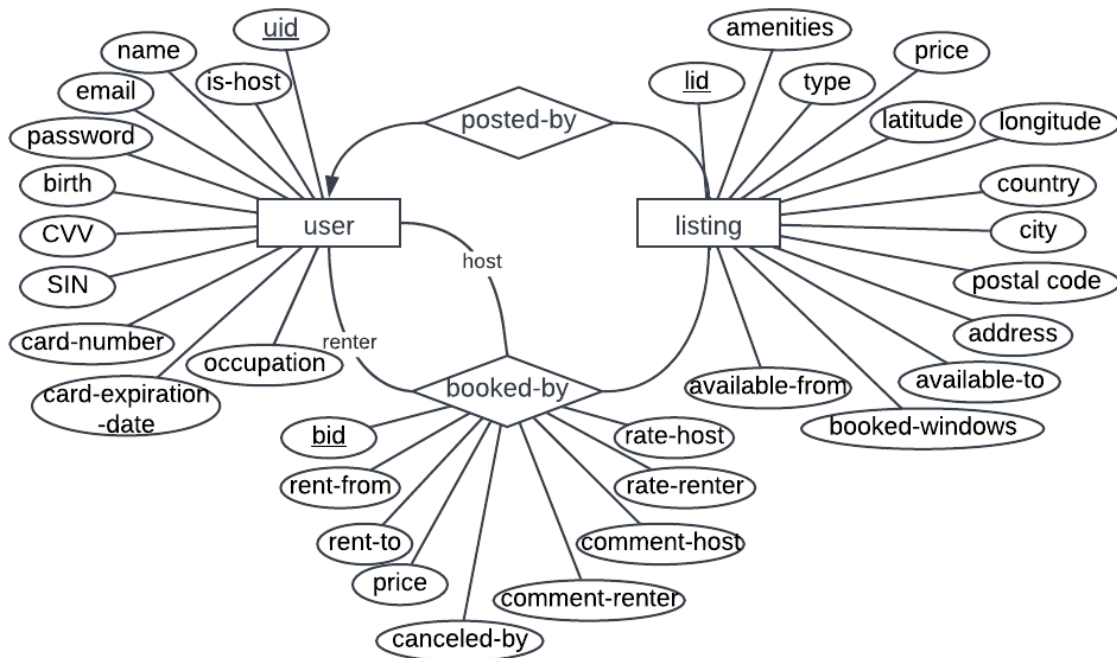
Global variable to track current user id and if is host.

Problem 3:

How to avoid multiple tables?

Initially, we planned to have one table for renters, one for hosts. Since we need record renter's paying but not host's. Later, we found the renter and host share many common attributes, so decided to add attributes to distinguish rather than have multiple tables. To be more specific, we add the attribute isHost to distinguish renter from user, making payinfo an optional attribute.

ER Diagram



*Primary keys are underlined

Relation Schema

user(uid, name, email, password, birth, occupation, SIN, cardNumber, cardExpirationDate, CVV, isHost)

listing(lid, h_uid, type, latitude, longitude, country, city, postalCode, address, amenities, price, availableFrom, availableTo)

booking(bid, lid, r_uid, h_uid, rentFrom, rentTo, price, commentByHost, commentByRenter, rateByHost, rateByRenter, canceledBy)

*Primary keys are underlined

User Manual

After the app is launched, the following options are presented on the main menu. Enter the corresponding number to select the option for its function. After each operation, the user is brought back to the main menu for the next option the user wishes to execute.

1. user register
 - check age
 - check email valid
2. user login
3. user edit profile
 - edit occupation and/or SIN
4. renter make a booking
 - user login as a renter
 - renter inputs rentFrom, rentTo (e.g. 20220120, 20220125)
 - renter sees a list of listings available during rentFrom-rentTo
 - renter make a booking
 - renter inputs payinfo
5. user comment/rate on finished bookings
 - user login as a host/renter
 - user sees a list of his listings
 - user chooses one from the list to comment/rate
 - * cannot comment/rate if not finished
6. user cancel booking
 - user login as a host/renter
 - user sees a list of his bookings
 - user chooses one from the list to cancel
 - * cannot cancel if already starts
7. search listing with multiple filters
 - user can apply 1 or more filters: distance, city, postalCode, address, price window
 - user sees a list of applicable listings
8. report-booking
 - total number of bookings in a specific date range by city
 - total number of bookings in a specific date range by zip code within a city
 - rank the renters by the number of bookings
 - rank the renters by the number of bookings
9. user account deletion
 - user login as a host/renter
 - user delete account, bookings and listings(if host)
 - * cannot delete if has ongoing bookings
10. report-listing-wordCloud
 - for each listing, find the word with most occurrences in renters' comments
11. host creates a listing

- user login as a host
- user creates a listing
- 12. host updates listing price
 - user login as a host
 - user updates price
- 13. host updates availability
 - user login as host
 - user updates listing availability
 - * cannot if exist booking of the listing that is outside of the new availability
- 14. host toolkit
 - user login as a host
 - host provides the city and type of his/her rental
 - host sees price and amenity suggested
- 15. report-listing
 - total number of listings per country
 - total number of listings per country and city
 - total number of listings per country, city and postalCode
 - rank hosts by the total number of listings they have per country
 - rank hosts by the total number of listings they have per city
- 16. delete listing
 - user login as a host
 - user sees a list of listings
 - user choose from the list to delete
 - *can only delete if no unfinished bookings

System Limitation

1. Multiple filters do not support amenities, time windows, and temporal filters.
2. not support reports:
 - the hosts and renters with the largest number of cancellations within a year
3. The system doesn't perform error checking for the format and correctness of the user's inputs. For example: the user may enter a listing available for a block of time in the past.
4. The database isn't secure, as the private information of users, such as passwords and SIN, are stored directly in the database without encryption.

