

CSCC43 Project: MyBnB

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Purpose:

Our purpose was to create a simple AirBnB-like replica using the SQL knowledge we've learned in the course and a basic command line interface. The application itself should be able to allow users to create accounts based on SIN, add listings, book listings, comment and more—all the basic features that should be available in a homestay marketplace to provide users a way to rent and rent out homes.

Conceptual Problems Encountered:

It was difficult to manipulate certain information using our original ER diagram and DDL statements, and throughout the entire project, there were lots of tweaks and additions to the relation schema in order to create certain functions. Sample records for auto-increment primary key tables also had repeat records on every startup due to the way that sample records were generated using a script and issues with IF THEN statements in stored procedures.

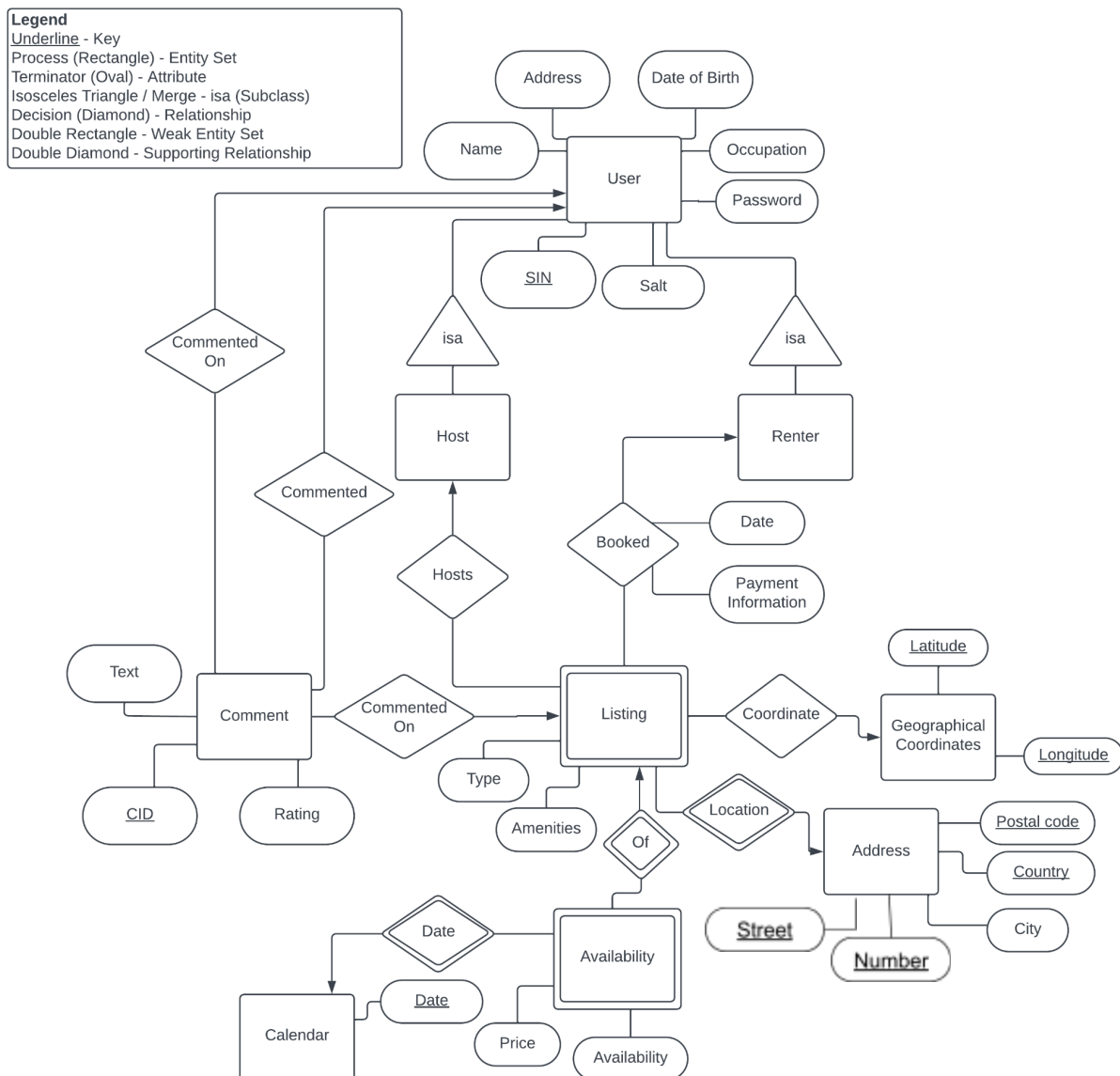
Solutions:

Since our original design for the database did not take into account the actual difficulty of using those tables to construct an application, new tables were added (Cancellation) and old tables were changed (every table save Hosts, CommentOnUser and CommentOnListing). The solution found for the repeat records was to use a combination of INSERT, SELECT and WHERE NOT EXISTS to make sure that a similar record did not already exist in the database before inserting.

Assumptions Made:

- We assume that a user requires a password to authenticate and authorize them to do certain actions such as booking a listing, commenting on listings and deleting their account.
- We assume that the attribute trait of table Characteristic and the attribute type of table Listing is the same as the amenities and types of listing provided in the official AirBnB system.
- We assume that you can only book in units of days.
- We assume that you can only create availabilities for listings in the future.
- We assume that by deleting a listing, you also cancel all bookings for that listing.
- We assume that noun phrases are not one word.
- We assume that on the deletion of a user, all their cancellation records should also be deleted.

ER Diagram:



Relation Schema:

Listing(Type, Street, Number, PostalCode, Country, City, Latitude, Longitude, Amenities)

Availability(Street, Number, PostalCode, Country, Date, Available, Price)

User(SIN, Password, Salt, Name, Address, Birthdate, Occupation)

Hosts(SIN, Street, Number, PostalCode, Country)

Booked(BID, SIN, Street, Number, PostalCode, Country, FromDate, ToDate, PaymentMethod, Price, Canceled, Updated)

Cancellation(BID, SIN)

Comment(CID, SIN, Rating, Text, Date)

CommentedOnUser(CID, SIN)

CommentedOnListing(CID, Street, Number, PostalCode, Country)

DDL Statements:

```
CREATE TABLE Listing (  
    Type VARCHAR(15),  
    Street VARCHAR(40),  
    Number INT,  
    PostalCode VARCHAR(10),  
    Country VARCHAR(56),  
    City VARCHAR(20),  
    Latitude DECIMAL(6,4),  
    Longitude DECIMAL(7,4),  
    Amenities SET('Wifi','Kitchen','Washer','Dryer',  
    'Air conditioning','Heating','Dedicated workspace', 'TV',  
    'Hair dryer','Iron','Pool','Hot tub','Free parking',  
    'EV charger','Crib','Gym','BBQ grill','Breakfast',  
    'Indoor fireplace','Smoking allowed','Beachfront',  
    'Waterfront','Ski-in/ski-out','Smoke alarm','Carbon monoxide alarm'),  
    PRIMARY KEY(Street, Number, PostalCode, Country)  
)  
  
CREATE TABLE Availability (  
    Street VARCHAR(40),  
    Number INT,  
    PostalCode VARCHAR(10),  
    Country VARCHAR(56),  
    Date DATE,  
    Available BOOL NOT NULL,  
    Price DECIMAL(10, 2),  
    PRIMARY KEY(Street, Number, PostalCode, Country, Date),  
    FOREIGN KEY (Street, Number, PostalCode, Country) REFERENCES  
    Listing(Street, Number, PostalCode, Country) ON DELETE CASCADE  
)  
  
CREATE TABLE User (  
    SIN CHAR(9),  
    Password VARCHAR(250) NOT NULL,  
    Salt BINARY(16) NOT NULL,  
    Name VARCHAR(250),  
    Address VARCHAR(250),  
    Birthdate DATE,
```

```

        Occupation VARCHAR(100),
        PRIMARY KEY(SIN)
    )

CREATE TABLE Hosts (
    SIN CHAR(9) NOT NULL,
    Street VARCHAR(40),
    Number INT,
    PostalCode VARCHAR(10),
    Country VARCHAR(56),
    PRIMARY KEY(Street, Number, PostalCode, Country),
    FOREIGN KEY (SIN) REFERENCES User(SIN) ON DELETE CASCADE,
    FOREIGN KEY (Street, Number, PostalCode, Country) REFERENCES
    Listing(Street, Number, PostalCode, Country) ON DELETE CASCADE
)

CREATE TABLE Booked (
    BID INT NOT NULL AUTO_INCREMENT,
    SIN CHAR(9) NOT NULL,
    Street VARCHAR(40),
    Number INT,
    PostalCode VARCHAR(10),
    Country VARCHAR(56),
    FromDate DATE,
    ToDate DATE,
    PaymentMethod SET('Credit card', 'Debit card', 'Cash'),
    Price DECIMAL(10,2),
    Canceled BOOL NOT NULL DEFAULT 0,
    Updated BOOL NOT NULL DEFAULT 0,
    PRIMARY KEY (BID),
    FOREIGN KEY (SIN) REFERENCES User(SIN) ON DELETE CASCADE,
    FOREIGN KEY (Street, Number, PostalCode, Country) REFERENCES
    Listing(Street, Number, PostalCode, Country) ON DELETE SET NULL
)

CREATE TABLE Cancellation (
    BID INT NOT NULL,
    SIN CHAR(9) NOT NULL,
    PRIMARY KEY (BID),
    FOREIGN KEY (BID) REFERENCES Booked(BID),

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```
        FOREIGN KEY (SIN) REFERENCES User(SIN) ON DELETE CASCADE
    )
```

```
CREATE TABLE Comment (
    CID INT NOT NULL AUTO_INCREMENT,
    SIN CHAR(9),
    Rating TINYINT,
    Text TEXT(65000),
    Date DATETIME DEFAULT CURRENT_TIMESTAMP,
    PRIMARY KEY(CID),
    FOREIGN KEY (SIN) REFERENCES User(SIN) ON DELETE SET NULL
)
```

```
CREATE TABLE CommentOnUser (
    CID INT,
    SINComment CHAR(9),
    PRIMARY KEY(CID),
    FOREIGN KEY (CID) REFERENCES Comment(CID),
    FOREIGN KEY (SINComment) REFERENCES User(SIN) ON DELETE
    CASCADE
)
```

```
CREATE TABLE CommentOnListing (
    CID INT,
    Street VARCHAR(40),
    Number INT,
    PostalCode VARCHAR(10),
    Country VARCHAR(56),
    PRIMARY KEY(CID),
    FOREIGN KEY (CID) REFERENCES Comment(CID),
    FOREIGN KEY (Street, Number, PostalCode, Country) REFERENCES
    Listing(Street, Number, PostalCode, Country) ON DELETE CASCADE
)
```

Source Code:

Github Repository Link: <https://github.com/amiaxys/MyBnB>