Bed and Breakfast

"A bed and breakfast in Boston, the style of a realistic photograph", generated by DALL·E 2

Problem to Solve

A Bed and Breakfast ("BnB" for short!) is a short-term place one might stay and pay the owner for the service, similar to a hotel. Over the past few years, AirBnB has allowed most anyone to rent out their place, whether it's a home, a cute cottage, or even a treehouse.

You're a data analyst for the City of Boston and you're interested in discovering how the rise of AirBnB has changed the local tourist scene. You've even compiled a database, `bnb.db`, filled with data directly from AirBnB. In `bnb.db`, whip up a few views that will paint a clearer picture of AirBnB's influence on the city of Boston.

Demo

```
$ sqlite3 bnb.db
sqlite> SELECT "property_type", "host_name", "bedrooms"
   ...> FROM
```

Recorded with **asciinema**

Distribution Code

For this problem, you'll need to download `bnb.db`, along with a few `.sql` files in which you'll write your queries.

▶ **Download the distribution code**

Schema

Within `bnb.db`, you'll find three tables that implement the relationships described in the ER diagram above. Click the drop-downs below to learn more about the schema of each table.

▼ **`listings` table**

The `listings` table contains the following columns:

- `id`, which is the ID of the listing.
- `property_type`, which is the type of the listing (e.g., "Entire rental unit", "Private room in rental unit", etc.).
- `host_name`, which is the AirBnB username of the listing's host.
- `accommodates`, which is the listing's maximum number of occupants.
- `bedrooms`, which is the listing's number of bedrooms.
- `description`, which is the description of the listing on AirBnB.

▼ **`reviews` table**

The `reviews` table contains the following columns:

- `id`, which is the ID of the review.
- `listing_id`, which is the ID of the listing which received the review.
- `date`, which is the date the review was posted.
- `reviewer_name`, which is the AirBnB username of the reviewer.
- `comments`, which is the content of the review.

▼ **`availabilities` table**

The `availabilities` table contains the following columns:

- `id`, which is the id of the availability.
- `listing_id`, which is the listing ID associated with the availability.
- `date`, which is the date of the availability.
- `available`, which is whether the date is still available to be booked (`TRUE` or `FALSE`).
- `price`, which is the price of staying on the given date.

Specification

In each of the corresponding `.sql` files, write a SQL statement to create each of the following views of the data in `bnb.db`. Note that, while views can be created from other views, each of your views should stand alone (i.e., not rely on a prior view).

No Descriptions

You might notice that when running

```
SELECT * FROM "listings" LIMIT 5;
```

the results look quite wonky! The `description` column contains descriptions with many line breaks, each of which are printed to your terminal.

In `no_descriptions.sql`, write a SQL statement to create a view named `no_descriptions` that includes all of the columns in the `listings` table *except* for `description`.

One-Bedrooms

In `one_bedrooms.sql`, write a SQL statement to create a view named `one_bedrooms`. This view should contain all listings that have exactly one bedroom. Ensure the view contains the following columns:

- `id`, which is the `id` of the listing from the `listings` table.
- `property_type`, from the `listings` table.
- `host_name`, from the `listings` table.
- `accommodates`, from the `listings` table.

Available

In `available.sql`, write a SQL statement to create a view named `available`. This view should contain all dates that are available at all listings. Ensure the view contains the following columns:

- `id`, which is the `id` of the listing from the `listings` table.
- `property_type`, from the `listings` table.
- `host_name`, from the `listings` table.
- `date`, from the `availabilities` table, which is the date of the availability.

Frequently Reviewed

In `frequently_reviewed.sql`, write a SQL statement to create a view named `frequently_reviewed`. This view should contain the 100 most frequently reviewed listings, sorted from most- to least-frequently reviewed. Ensure the view contains the following columns:

- `id`, which is the `id` of the listing from the `listings` table.
- `property_type`, from the `listings` table.
- `host_name`, from the `listings` table.
- `reviews`, which is the number of reviews the listing has received.

If any two listings have the same number of reviews, sort by `property_type` (in alphabetical order), followed by `host_name` (in alphabetical order).

June Vacancies

In `june_vacancies.sql`, write a SQL statement to create a view named `june_vacancies`. This view should contain all listings and the number of days in June of 2023 that they remained vacant. Ensure the view contains the following columns:

- `id`, which is the `id` of the listing from the `listings` table.
- `property_type`, from the `listings` table.
- `host_name`, from the `listings` table.
- `days_vacant`, which is the number of days in June of 2023, that the given listing was marked as available.

Usage

To test your views as you write them in your `.sql` files, you can run a query on the database by running

```
.read FILENAME
```

where `FILENAME` is the name of the file containing your SQL query. For example,

```
.read no_descriptions.sql
```

Keep in mind you can also use

```
DROP VIEW name;
```

where `name` is the name of your view, to remove a view before creating it anew.

How to Test

While `check50` is available for this problem, you're encouraged to also test your code on your own. You might try queries like the below:

- How many listings are there in total? Use your `no_descriptions` view to find that there are 3,973.
- How many one-bedroom listings are there? And how many can accommodate at least 4 guests? Use your `one_bedrooms` view to find that of the 1,228 one-bedrooms, 222 of them can accommodate your group of 4.
- How many listings have availability for December 31st, 2023 (i.e., "2023-12-31")? Use your `available` view to find that there are 2,251. How many of those are available on any type of boat? You should find that there are 7. Enjoy your New Year's Eve afloat!
- How many reviews does the most frequently reviewed property have? And who is the host of that property? Use your `frequently_reviewed` view to find that Tiffany's property has 860 reviews.
- How many listings were available in June 2023? Use your `june_vacancies` view to find that there were 1,895 vacancies.

Correctness

For performance's sake, `check50` uses a smaller database than you've downloaded. For that reason, results may not match between the two databases. If your query runs correctly on the database you've downloaded, it will also run correctly on `check50`'s database! If your query runs incorrectly on `check50`'s database, it's also running incorrectly on your own database.

```
check50 cs50/problems/2024/sql/bnb
```

How to Submit

In your terminal, execute the below to submit your work.

```
submit50 cs50/problems/2024/sql/bnb
```

Acknowledgements

Data retrieved from insideairbnb.com.