MyBnB

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Project Purpose

The MyBnB Database Design Project aims to develop a database system for a Canadian home-sharing platform, similar to AirBnB. The project involves designing a database to manage property listings, user profiles, bookings, comments, ratings, and other essential functionalities. The system will enable users to create profiles, book listings, manage availability, and interact through comments and ratings. Additionally, it will support various search queries and provide informative reports. The project also includes creating a host toolkit to suggest pricing strategies, amenities, and expected revenue increase for listings. Overall, the project aims to deliver a user-friendly and efficient database system for the Canadian market.

Conceptual Problems and Solutions

- Distance Calculation: Utilized 2D factor distance method to calculate distance from listing the usage of range and longitude.
- Booking and Listing Ownership: Implemented ID-primarily based validation to make certain simplest proprietors can get rid of listings and simplest applicable parties can cancel bookings.
- Query Placeholder Matching: Added function to validate placeholder matching with question parameters to keep away from mismatch errors.
- Filtering Unused Listing Attributes: Created a committed magnificence for showing filtered outcomes to GUI, coping with unnecessary attributes.
- Sorting Logic Simplification: Replaced confusing dual Booleans with a single Boolean sortbyprice for readability in sorting by means of charge or distance.

Assumptions Made

In the development of the MyBnB Database Design Project, several key assumptions have been made to ensure the effectiveness, accuracy, and usability of the platform for users. These assumptions are essential guidelines that govern the input provided by users and help maintain data integrity within the system. The following assumptions have been considered during the project's design:

User Profile Creation Assumptions:

- It is assumed that all required user information must be provided during the creation of a user profile to establish a comprehensive and reliable user record.
- The project assumes that users must provide a valid Canadian Social Insurance Number (SIN) consisting of exactly 9 digits. This ensures the uniqueness and accuracy of user identification.
- Each user's SIN is assumed to be unique within the database to prevent duplicate user profiles and maintain data integrity.
- For effective payment processing, the system assumes that users must provide a valid Canadian payment method, such as Visa, Mastercard, American Express, or Interac.

Listing Creation Assumptions:

- The project assumes that complete and accurate information must be provided when creating a new property listing to facilitate effective property management and accurate search results.
- It is assumed that the listing type must be specified and should be one of the valid types (Home, Apartment, Studio).
- The system assumes that a valid Canadian postal code must be provided for listings in Canada to ensure accurate location information.
- For relevant search results, the project assumes that the listing's city must be a valid Canadian city name (e.g., Toronto, Vancouver, Montreal).
- It is assumed that listings are applicable only to Canada, and hence, the country must be specified as "Canada."

Single Availability per Day Assumption:

- The project assumes that on any given day, a single availability status can be associated with a listing. This means that a listing cannot have multiple availability entries for the same date.
- For instance, if a listing is marked as available for a specific date, it is assumed that the same listing cannot be simultaneously marked as unavailable for that particular date. Similarly, if a listing is unavailable on a specific date, it cannot have any other availability status (e.g., partially available) for the same date.
- This assumption ensures simplicity and clarity in managing listing availability, avoiding potential conflicts or ambiguities when renters search for available properties on specific dates.
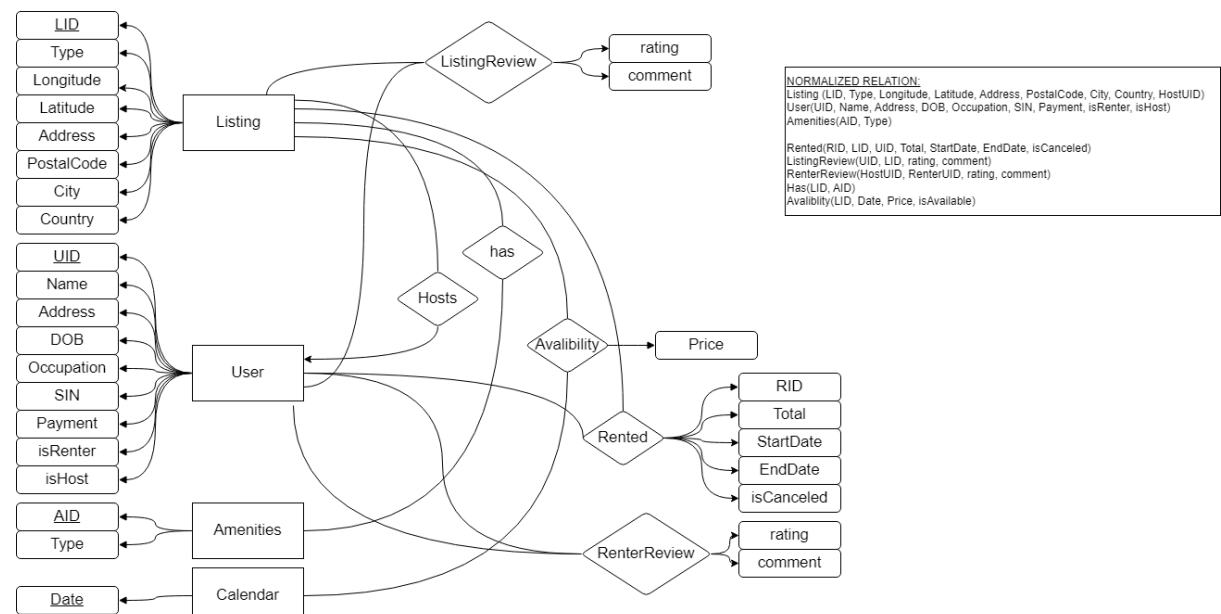
Default Latitude and Longitude:

- When filtering is not performed based on Latitude and Longitude, it is assumed that listings without specific geographic coordinates will be treated as originating from the point (0,0).
- This approach ensures consistent calculations and enables a broader search for listings with unknown locations.

Postal Code Filtering:

- For postal code filtering, the project assumes that only the first three letters of the Canadian postal code will be considered.
- This allows users to search for listings based on a broader region or neighborhood, while still providing relevant and accurate results.

These assumptions have been carefully considered to tailor the MyBnB platform specifically for the Canadian market, ensuring that user-provided data is accurate, relevant, and aligned with the intended purpose of the platform. By adhering to these assumptions, the MyBnB Database Design Project aims to deliver a user-friendly and reliable experience to both hosts and renters, enabling seamless interactions and effective property management.

Entity-Relationship (ER) Diagram

Relation Schema and Keys

NORMALIZED RELATION:
Listing (LID, Type, Longitude, Latitude, Address, PostalCode, City, Country, HostUID)
User(UID, Name, Address, DOB, Occupation, SIN, Payment, isRenter, isHost)
Amenities(AID, Type)

Rented(RID, LID, UID, Total, StartDate, EndDate, isCanceled)
ListingReview(UID, LID, rating, comment)
RenterReview(HostUID, RenterUID, rating, comment)
Has(LID, AID)
Avaliblity(LID, Date, Price, isAvailable)

Database Design and Normalization

This database design is well-structured and normalized. It has clear relationships, and each relation has stores information about one thing only. This allows for minimal redundancy and avoids data duplication. We also use some foreign key constraints to ensure referential integrity. The database design also implements checks to ensure that the user can input invalid data

that would violate data integrity. The database also follows appropriate naming conventions that make it easy to read and understand what that field is supposed to store.

Data Definition Language (DDL) Statements

We have implemented classes for each table based on the provided table schema. These classes are in the package named "Table." The classes represent the tables in the database, and for each class, I have implemented basic methods such as create, drop, update, and delete, as well as getter and setter methods for each attribute.

Here is a summary of the table classes and their corresponding methods:

- Listing class:

  - Attributes: LID, Type, Longitude, Latitude, Address, PostalCode, City, Country, HostUID
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- User class:

  - Attributes: UID, Name, Address, DOB, Occupation, SIN, Payment, isRenter, isHost
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- Amenities class:

  - Attributes: AID, Type
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- Rented class:

  - Attributes: RID, LID, UID, Total, StartDate, EndDate, isCanceled
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- ListingReview class:

  - Attributes: UID, LID, rating, comment
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- RenterReview class:

  - Attributes: HostUID, RenterUID, rating, comment
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- Has class:

  - Attributes: LID, AID
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

- Availability class:

  - Attributes: LID, Date, Price, isAvailable
  - Methods: create, drop, update, delete, getter and setter methods for each attribute.

These classes and methods are utilized later on in the project to perform various database operations such as inserting data, retrieving data, updating data, and deleting data for each respective table. The implementation details can be checked in the project's repository.

Source Code and Data Files

https://github.com/NamanBhandari26/MyBnB

User Manual

MyBnB's start menu provides a list of actions users can perform within the application. It provides a selection of functions and functions related to managing user profiles, creating and managing lists, setting up accommodations, generating various reports, and using host toolkits. The menu

acts as a user-friendly interface to navigate and interact with MyBnB application features.

```
Hello, welcome to MyBnB
Starting Services...
========= Menu =========
1. Create Tables
2. Drop Tables
3. Drop Database
4. Add Data
5. Create User Profile
6. Delete User Profile
7. Book Listing
8. Remove Listing
9. Cancel Booking
10. Create Listing
11. Update Listing Price
12. Update Listing Availability
13. Insert Renter Comment
14. Insert Host Comment
15. Search Listings by Location
16. Search Listings by Postal Code
17. Search Listing by Address
18. Search Listings by Date Range
19. Search Listings with Filters
20. Report Total Booking by Date and City
21. Report Total Booking by Date and Postal
22. Report Total Listing by Country
23. Report Total Listing by Country and City
24. Report Total Listing by Postal
25. Report Rank Hosts Per Country
26. Report Rank Hosts Per Country and City
27. Report Commercial Hosts
28. Report Rank Renter Between Date
29. Report Rank Renter Between Date and City
30. Report Most Host Cancels
31. Report Most Renter Cancels
32. Report Get Noun Prases for Listing
33. Host Tool Kit Suggested Price
34. Host Tool Kit Suggested Amenities
35. Quit
=========================
Enter the number of the operation you want to perform:
```

1. Create Tables

   a. Description: This option allows you to create the necessary tables in the database to store the MyBnB data.
   b. Steps:
      i. Click on "Create Tables" from the main menu.
      ii. Confirm the action to create the tables by entering "y" for yes or "n" for no.
      iii. If confirmed, the tables will be created in the database. Otherwise, the operation will be canceled.

```
=========================
Enter the number of the operation you want to perform:
1
Are you sure you want to create tables? (y/n):
y
Operation completed.
```

2. Drop Tables
   a. Description: This option allows you to drop the existing tables from the database.
   b. Steps:
      i. Click on "Drop Tables" from the main menu.
      ii. Confirm the action to drop the tables by entering "y" for yes or "n" for no.
      iii. If confirmed, the tables will be removed from the database. Otherwise, the operation will be canceled.

```
==========================
Enter the number of the operation you want to perform:
2
Are you sure you want to drop tables? (y/n):
y
Operation completed.
```

3. Drop Database
   a. Description: This option allows you to completely delete the MyBnB database along with all the data.
   b. Steps:
      i. Click on "Drop Database" from the main menu.
      ii. Confirm the action to drop the database by entering "y" for yes or "n" for no.
      iii. If confirmed, the entire database will be deleted. Otherwise, the operation will be canceled.

```
==========================
Enter the number of the operation you want to perform:
3
Are you sure you want to drop the database? (y/n):
y
Operation completed.
```

4. Add Data
   a. Description: This option allows you to add data to the existing tables in the database.
   b. Steps:
      i. Click on "Add Data" from the main menu.
      ii. Follow the on-screen prompts to enter the required information for the new data entry.
      iii. Data will be added to the respective tables in the database.

```
==========================
Enter the number of the operation you want to perform:
4
Data Added...
```

5. Create User Profile
   a. Description: This option allows you to create a user profile for a new user.

b. Steps:
    i. Click on "Create User Profile" from the main menu.
    ii. Follow the on-screen prompts to enter the user's details such as name, address, date of birth, occupation, etc.
    iii. The user profile will be created, and a unique user ID (UID) will be generated.

```
=============================
Enter the number of the operation you want to perform:
5
Enter user name:
Naman
Enter address:
York Mills
Enter date of birth (yyyy-mm-dd):
2000-01-01
Enter occupation:
Student
Enter SIN:
123456789
Enter payment method:
Visa
Is the user a renter? (true/false):
true
Is the user a host? (true/false):
true
User created with UID: 7
```

6. Delete User Profile
    a. Description: This option allows you to delete an existing user profile from the database.
    b. Steps:
        i. Click on "Delete User Profile" from the main menu.
        ii. Enter the user's unique user ID (UID) or name to identify the profile to be deleted.
        iii. Confirm the action to delete the user profile, and the corresponding user data will be removed from the database.

```
=========================
Enter the number of the operation you want to perform:
6
Enter the UID of the user to delete:
7
User with UID 7 deleted.
```

7. Book Listing
    a. Description: This option allows you to book a listing for a specific user.
    b. Steps:
        i. Click on "Book Listing" from the main menu.
        ii. Enter the unique listing ID (LID) of the listing to be booked.

iii. Enter the unique user ID (UID) of the user for booking.
    iv. Provide the total amount for the booking.
    v. Enter the start date (yyyy-mm-dd) and end date (yyyy-mm-dd) for the booking period.
    vi. Specify if the booking is canceled or not by entering "true" for canceled or "false" for not canceled.
    vii. Confirm the action to book the listing, and the booking will be added to the database with a unique booking ID (RID).

```
==========================
Enter the number of the operation you want to perform:
7
Enter listing ID (LID) to book:
1
Enter user ID (UID) for booking:
1
Enter total amount for booking:
100
Enter start date (yyyy-mm-dd) for booking:
2020-04-07
Enter end date (yyyy-mm-dd) for booking:
2020-04-08
Is the booking canceled? (true/false):
false
Booking created with RID: 5
```

8. Remove Listing
    a. Description: This option allows you to remove a listing from the database.
    b. Steps:
        i. Click on "Remove Listing" from the main menu.
        ii. Enter the unique listing ID (LID) of the listing to be removed.
        iii. Enter the unique user ID (UID) for authorization to remove the listing.
        iv. Confirm the action to remove the listing, and the listing will be deleted from the database.

```
==========================
Enter the number of the operation you want to perform:
8
Enter listing ID (LID) to remove:
15
Enter user ID (UID) for authorization:
6
Listing with LID 15 removed.
```

9. Cancel Booking
    a. Description: This option allows you to cancel a booked listing for a user.

b. Steps:
  i. Click on "Cancel Booking" from the main menu.
  ii. Enter the unique booking ID (RID) of the booking to be canceled.
  iii. Enter the unique user ID (UID) for authorization to cancel the booking.
  iv. Confirm the action to cancel the booking, and the booking will be marked as canceled in the database.

```
=========================
Enter the number of the operation you want to perform:
9
Enter booking ID (RID) to cancel:
5
Enter user ID (UID) for authorization:
1
Booking with RID 5 canceled.
```

10. Create Listing
  a. Description: This option allows you to create a new listing for a host.
  b. Steps:
    i. Click on "Create Listing" from the main menu.
    ii. Follow the on-screen prompts to enter the listing details such as type, longitude, latitude, address, postal code, city, country, and the unique user ID (UID) of the host.
    iii. The listing will be added to the database with a unique listing ID (LID).

```
=========================
Enter the number of the operation you want to perform:
10
Enter listing type:
Home
Enter longitude:
264
Enter latitude:
264
Enter address:
M
Enter postal code:
N2J 6B4
Enter city:
Toronto
Enter country:
Canada
Enter user ID (UID) for listing host:
6
Listing created with LID: 16
```

11. Update Listing Price

a. Description: This option allows you to update the price of an existing listing.
b. Steps:
    i. Click on "Update Listing Price" from the main menu.
    ii. Enter the unique listing ID (LID) of the listing to be updated.
    iii. Provide the new price for the listing.
    iv. Enter the start date (yyyy-mm-dd) and end date (yyyy-mm-dd) for the period when the price update applies.
    v. The listing's price will be updated in the database.

```
========================
Enter the number of the operation you want to perform:
11
Enter listing ID (LID) to update price:
1
Enter new price:
60
Enter start date (yyyy-mm-dd) for price update:
2020-04-09
Enter end date (yyyy-mm-dd) for price update:
2020-04-10
Price updated for listing with LID 1
```

12. Update Listing Availability
    a. Description: This option allows you to update the availability of an existing listing.
    b. Steps:
        i. Click on "Update Listing Availability" from the main menu.
        ii. Enter the unique listing ID (LID) of the listing to be updated.
        iii. Enter the date (yyyy-mm-dd) for which the availability status will be changed.
        iv. Specify if the listing is available on this date by entering "true" for available or "false" for unavailable.
        v. The listing's availability will be updated in the database.

```
========================
Enter the number of the operation you want to perform:
12
Enter listing ID (LID) to update availability:
1
Enter date (yyyy-mm-dd) for availability update:
2020-04-09
Is the listing available on this date? (true/false):
false
Availability updated for listing with LID 1
```

13. Insert Renter Comment
    a. Description: This option allows you to insert a comment from a renter for a specific listing.

b. Steps:
    i. Click on "Insert Renter Comment" from the main menu.
    ii. Enter the unique host ID (UID) for the renter comment.
    iii. Enter the unique renter ID (UID) for whom the comment is being inserted.
    iv. Enter a rating (1-5) for the renter comment.
    v. Provide a comment for the renter.
    vi. The comment will be added to the listing and associated with the renter.

```
========================
Enter the number of the operation you want to perform:
13
Enter host ID (UID) for renter comment:
4
Enter renter ID (UID) for renter comment:
1
Enter rating (1–5) for renter comment:
4
Enter comment for renter:
Good
Renter comment inserted.
```

14. Insert Host Comment
a. Description: This option allows you to insert a comment from a host for a specific renter.
b. Steps:
    i. Click on "Insert Host Comment" from the main menu.
    ii. Enter the unique renter ID (UID) for the host comment.
    iii. Enter the unique listing ID (LID) for the host comment.
    iv. Enter a rating (1-5) for the host comment.
    v. Provide a comment for the host.
    vi. The comment will be added to the renter's profile and associated with the listing.

```
========================
Enter the number of the operation you want to perform:
14
Enter renter ID (UID) for host comment:
3
Enter Listing ID (LID) for host comment:
3
Enter rating (1–5) for host comment:
1
Enter comment for host:
Bad
Host comment inserted.
```

15. Search Listings by Location

a. Description: This option allows you to search for listings based on their location.
b. Steps:
    i. Click on "Search Listings by Location" from the main menu.
    ii. Enter the latitude and longitude for the search location.
    iii. Specify the maximum distance (in kilometers) for the search.
    iv. Choose to sort the results by price in ascending order by entering "true" or "false" for sorting.
    v. Listings found within the specified location and distance will be displayed.

```
========================
Enter the number of the operation you want to perform:
15
Enter latitude for search:
-79
Enter longitude for search:
43
Enter maximum distance (in km) for search:
1
Sort by price ascending? (true/false):
true
Listings found within 1.0 km of the specified location:
```

16. Search Listings by Postal Code
a. Description: This option allows you to search for listings based on their postal code.
b. Steps:
    i. Click on "Search Listings by Postal Code" from the main menu.
    ii. Enter the postal code for the search.
    iii. Choose to sort the results by price in ascending order by entering "true" or "false" for sorting.
    iv. Listings found within the same and adjacent postal codes will be displayed.

```
========================
Enter the number of the operation you want to perform:
16
Enter postal code for search(only first 3 letters):
M4X
Sort by price ascending? (true/false):
true
Listings found within the same and adjacent postal codes
```

17. Search Listing by Address
a. Description: This option allows you to search for a specific listing by its address.
b. Steps:
    i. Click on "Search Listing by Address" from the main menu.

ii. Enter the address for the search.

iii. If the listing with the specified address is found, its details will be displayed. Otherwise, a message indicating no listing found will be shown.

```
=======================
Enter the number of the operation you want to perform:
17
Enter address for search:
123 Queen St W
Listing found with the specified address:
```

18. Search Listings by Date Range

    a. Description: This option allows you to search for listings available within a specified date range.

    b. Steps:

        i. Click on "Search Listings by Date Range" from the main menu.

        ii. Enter the start and end dates (yyyy-mm-dd) for the desired date range.

        iii. Choose to sort the results by price in ascending order by entering "true" or "false" for sorting.

        iv. Listings available for booking between the specified dates will be displayed.

```
=======================
Enter the number of the operation you want to perform:
18
Enter start date (yyyy-mm-dd) for search:
2020-04-07
Enter end date (yyyy-mm-dd) for search:
2020-04-08
Sort by price ascending? (true/false):
true
Listings available for booking between 2020-04-07 and 2020-04-08:
```

19. Search Listings with Filters

    a. Description: This option allows you to search for listings using various filters (e.g., location, postal code, date range, price, amenities, etc.).

    b. Steps:

        i. Click on "Search Listings with Filters" from the main menu.

        ii. Follow the on-screen prompts to enter the desired filters, such as latitude, longitude, postal code, date range, price range, and amenities.

        iii. Choose to sort the results by price in ascending order by entering "true" or "false" for sorting.

        iv. Listings that match the applied filters will be displayed.

```
=========================
Enter the number of the operation you want to perform:
19
Enter latitude for search:
-79.347015
Enter longitude for search:
43.65107
Enter postal code for search:(only first 3 letters)
M4X
Enter start date (yyyy-mm-dd) for search:
2020-04-07
Enter end date (yyyy-mm-dd) for search:
2020-04-07
Enter minimum price for search:
54
Enter maximum price for search:
56
Sort by price ascending? (true/false):
true
Enter amenity ID to filter (Enter -1 to stop adding amenities):
1
Enter amenity ID to filter (Enter -1 to stop adding amenities):
-1
Listings with applied filters:
```

20. Report Total Booking by Date and City
    a. Description: This option allows you to get the total booking by the date range and city
    b. Steps:
        i. Click on "Report Total Booking by Date and City" from the main menu.
        ii. Enter the start date for the search.
        iii. Enter the end date for the search.
        iv. Enter the country for the search.
        v. Enter the city for the search.
        vi. Total bookings will be displayed.

```
=========================
Enter the number of the operation you want to perform:
20
Enter Start Date (yyyy-mm-dd):
2001-11-11
Enter End Date (yyyy-mm-dd):
2025-11-11
Enter Country:
Canada
Enter City:
Toronto
Total Bookings: 0
```

21. Report Total Booking by Date and Postal
    a. Description: This option allows you to get the total booking by the date range and postal code
    b. Steps:

      i.   Click on " Report Total Booking by Date and Postal" from the main menu.
     ii.   Enter the start date for the search.
    iii.   Enter the end date for the search.
    iv.   Enter the country for the search.
     v.   Enter the postal for the search you can give 0 or more for more precise search.
    vi.   Total bookings will be displayed.

```
========================
Enter the number of the operation you want to perform:
21
Enter Start Date (yyyy-mm-dd):
2001-11-11
Enter End Date (yyyy-mm-dd):
2025-11-11
Enter Country:
Canada
Enter PostalCode:
M4X
Total Bookings: 4
```

22. Report Total Listing by Country
   a. Description: This option allows you to get the total listing by the country
   b. Steps:
      i.   Click on " Report Total Listing by Country" from the main menu.
     ii.   Enter the country for the search.
    iii.   Total listing will be displayed.

```
========================
Enter the number of the operation you want to perform:
22
Enter Country:
Canada
Total Listing: 15
```

23. Report Total Listing by Country and City
   a. Description: This option allows you to get the total listing by the country and city
   b. Steps:
      i.   Click on " Report Total Listing by Country and City " from the main menu.
     ii.   Enter the country for the search.
    iii.   Enter the city for the search.
    iv.   Total listing will be displayed.

```
=========================
Enter the number of the operation you want to perform:
23
Enter Country:
Canada
Enter City:
Toronto
Total Listing: 7
```

24. Report Total Listing by Postal
   a. Description: This option allows you to get the total listing by the postal code
   b. Steps:
      i. Click on " Report Total Listing by Postal" from the main menu.
      ii. Enter the country for the search.
      iii. Enter the postal for the search you can give 0 or more for more precise search.
      iv. Total listing will be displayed.

```
=========================
Enter the number of the operation you want to perform:
24
Enter Country:
Canada
Enter Postal:
M4X
Total Listing: 3
```

25. Report Rank Hosts Per Country
   a. Description: This option allows you to rank host by country
   b. Steps:
      i. Click on " Report Rank Hosts Per Country" from the main menu.
      ii. Enter the country for the search.
      iii. All the host id will be displayed with how many listings they have in descending order.

```
=========================
Enter the number of the operation you want to perform:
25
Enter Country:
Canada
HostID: 6, with 11 listings
HostID: 4, with 2 listings
HostID: 5, with 2 listings
========= Menu =========
```

26. Report Rank Hosts Per Country and City
   a. Description: This option allows you to rank host by country and city
   b. Steps:
      i. Click on "Report Rank Hosts Per Country and City " from the main menu.

ii. Enter the country for the search.

iii. Enter the city for the search.

iv. All the host id will be displayed with how many listings they have in descending order.

```
==========================
Enter the number of the operation you want to perform:
26
Enter Country:
Canada
Enter City:
Toronto
HostID: 6, with 4 listings
HostID: 4, with 2 listings
HostID: 5, with 1 listings
========= Menu =========
```

27. Report Commercial Hosts

    a. Description: This option allows you to get all possible commercial hosts

    b. Steps:

        i. Click on " Report Commercial Hosts" from the main menu.

        ii. Enter the country for the search.

        iii. Enter the city for the search.

        iv. Enter the postal for the search you can give 0 or more for more precise search.

        v. Total listing will be displayed.

```
==========================
Enter the number of the operation you want to perform:
27
Enter Country:
Canada
Enter City:
Vancouver
HostID: 6, with 10 listings
```

28. Report Rank Renter Between Date

    a. Description: This option allows you to rank renters between a date range

    b. Steps:

        i. Click on " Report Rank Renter Between Date" from the main menu.

        ii. Enter the start date for the search.

        iii. Enter the end date for the search.

        iv. All the renter id will be displayed with how many booking they have in descending order.

```
==========================
Enter the number of the operation you want to perform:
28
Enter Start Date (yyyy-mm-dd):
2000-11-11
Enter End Date (yyyy-mm-dd):
2200-11-11
RenterID: 3, with 2 bookings
RenterID: 1, with 1 bookings
RenterID: 2, with 1 bookings
```

29. Report Rank Renter Between Date and City
    a. Description: This option allows you to rank renters between a date range and in a city
    b. Steps:
        i. Click on " Report Rank Renter Between Date and City" from the main menu.
        ii. Enter the start date for the search.
        iii. Enter the end date for the search.
        iv. Enter the country for the search.
        v. Enter the city for the search.
        vi. All the renter id will be displayed with how many booking they have in descending order.

```
==========================
Enter the number of the operation you want to perform:
29
Enter Start Date (yyyy-mm-dd):
2000-01-01
Enter End Date (yyyy-mm-dd):
2029-11-11
Enter Country:
Canada
Enter City:
Toronto
RenterID: 3, with 2 bookings
RenterID: 1, with 1 bookings
RenterID: 2, with 1 bookings
```

30. Report Most Host Cancels
    a. Description: This option allows you to get host with the most cancels
    b. Steps:
        i. Click on " Report Most Host Cancels " from the main menu.
        ii. All the host id will be displayed with how many cancels they have in descending order.

```
==========================
Enter the number of the operation you want to perform:
30
HostID: 4, with 1 cancels
```

31. Report Most Renter Cancels

    a. Description: This option allows you to get renter with the most cancels

    b. Steps:

        i. Click on " Report Most Renter Cancels " from the main menu.

        ii. All the user id will be displayed with how many cancels they have in descending order.

```
=========================
Enter the number of the operation you want to perform:
31
RenterID: 3, with 1 cancels
```

32. Report Get Noun Phrases for Listing

    a. Description: This option allows you to get all the noun phrases in the comments of a specific listing.

    b. Steps:

        i. Click on " Report Get Noun Phrases for Listing " from the main menu.

        ii. Noun phrases will be displayed for each listing.

```
=========================
Enter the number of the operation you want to perform:
32
SLF4J: Failed to load class "org.slf4j.impl.StaticLoggerBinder".
SLF4J: Defaulting to no-operation (NOP) logger implementation
SLF4J: See http://www.slf4j.org/codes.html#StaticLoggerBinder for further details.
---------------------
LID: 1
Noun: town, Freq: 1
Noun: a cozy cabin, Freq: 1
Noun: Great space to spend a peaceful weekend but close enough to town to not feel isolated.. Great little stay in a cozy cabin set on a peninsula overlooking both sides of the lake., Freq: 1
Noun: both sides, Freq: 1
Noun: Great little stay, Freq: 1
Noun: a peninsula, Freq: 1
Noun: another couple or 2 person, Freq: 1
Noun: a peaceful weekend, Freq: 1
Noun: Great little stay in a cozy cabin set on a peninsula overlooking both sides of the lake., Freq: 1
Noun: a cozy cabin set on a peninsula overlooking both sides of the lake., Freq: 1
Noun: Great space to spend a peaceful weekend, Freq: 1
Noun: Great space, Freq: 1
Noun: both sides of the lake., Freq: 1
Noun: the lake., Freq: 1
---------------------
---------------------
LID: 2
Noun: neighbours and noise. Cannot, Freq: 1
Noun: lake due to lillypads/weeds. Outdoor kitchen is a fire, Freq: 1
Noun: the grid. Plenty of neighbours and noise. Cannot, Freq: 1
Noun: noise. Cannot, Freq: 1
Noun: the grid. Plenty, Freq: 1
Noun: neighbours, Freq: 1
Noun: lake, Freq: 1
Noun: a fire, Freq: 1
Noun: Outdoor kitchen, Freq: 1
---------------------
```

33. Host Tool Kit Suggested Price

    a. Description: This option allows you to get what price the host should put a listing for

    b. Steps:

        i. Click on " Host Tool Kit Suggested Price " from the main menu.

        ii. Enter the date of listing.

        iii. Enter the city of listing.

        iv. Suggested price will be displayed.

```
==========================
Enter the number of the operation you want to perform:
33
Enter Date (yyyy-mm-dd):
2020-04-07
Enter City:
Toronto
Suggested Price: 65.0
```

34. Host Tool Kit Suggested Amenities
    a. Description: This option allows you to get what amenities a host should add to their listing
    b. Steps:
        i. Click on " Host Tool Kit Suggested Amenities " from the main menu.
        ii. Enter the lid of a listing.
        iii. A list of suggested amenities will be displayed.

```
==========================
Enter the number of the operation you want to perform:
34
Enter LID:
1
Amenity Recommended: BBQ grill
Amenity Recommended: Breakfast
Amenity Recommended: Indoor fireplace
Amenity Recommended: Carbon monoxide alarm
```

System Limitations and Possibilities for Improvement

Limitations of this system is that it uses Canadian postal cods to search, which means that in the future if we want to expand to other countries our current solution might not work. To fix this issue what we could do is find a third party api and integrate it into our java program so it can handle the postal code inputs and then it could return a longitude and latitude that would make it easier to expand to new areas.

Another limitation is that right now we only look at the date and city that the user is trying to put a listing before suggesting a price. To improve this, we could instead train a machine learning model that is given all the data of a listing including date, and price and use that you help suggest a price.