



INSY 661 – Integrative Project

Group 3:

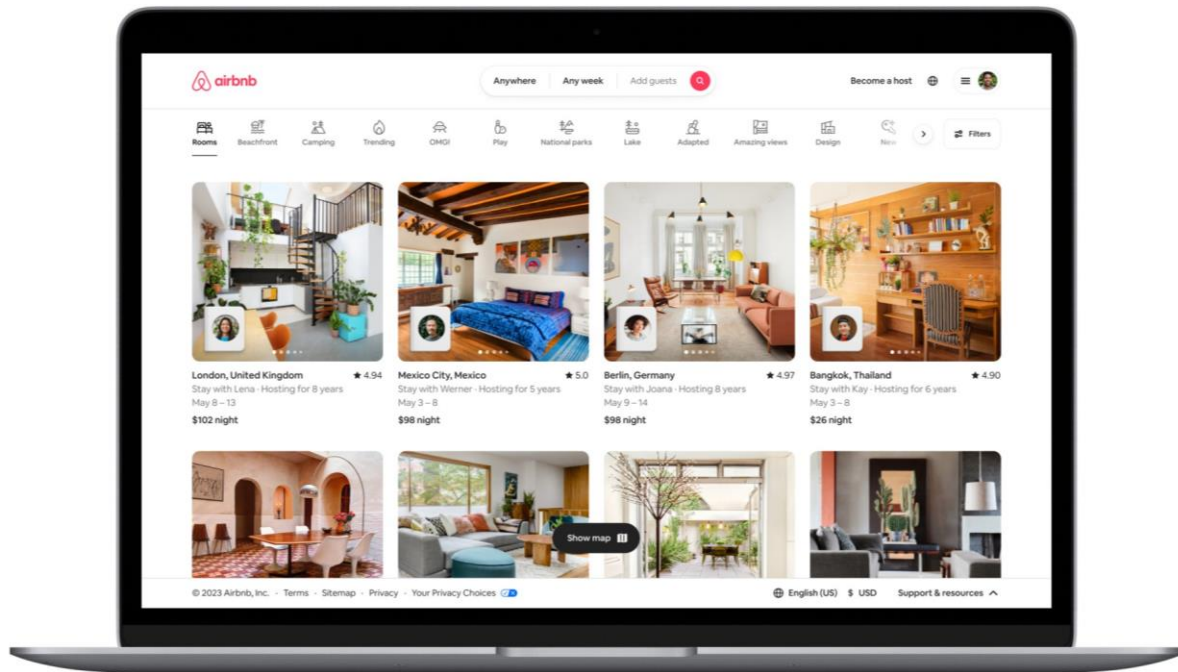
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OUTLINE

- Overview of Business Scenario
- Mission Statement & Objective
- ERD Model & Assumptions
- Overview of Relational Schema
- Queries
- Learning Experience



Overview of Business Scenario – Business Description



- The business is based on Airbnb, a platform that enables guests to find and book unique accommodations offered by hosts around the world. The platform features a diverse selection of properties, each with its own characteristics and comforts. The platform also ensures a safe and smooth transaction experience by verifying the identity of both hosts and guests, and managing the payments from guests to hosts.
- The platform empowers guests to customize their travel plans by creating wishlists of properties they like, and by booking properties that suit their needs and preferences. Guests can also communicate with hosts and the platform in their preferred languages. The platform also enriches guests' travel experiences by helping them explore attractions and activities in different destinations, and by recommending properties that are nearby.

Overview of Business Scenario – Users of the platform

Guests



Individuals or groups looking to book accommodations or experiences. They may look for places, book reservations, give reviews, and maintain their profiles.

Hosts



Property owners or managers who list their properties or experiences for rent will have the ability to manage their listings, view bookings, interact with guests, and receive payments.

Administrators & Customer Support



Individuals who assist both hosts and guests with queries, issues, or disputes. They can access booking details, user profiles, and other necessary information to provide support.

Data Analysts & IT Support



Individuals in charge of managing the database system, assuring its seamless functioning, and providing technical assistance. They can get access to system logs, user activities, and other technical information.

Overview of Business Scenario – Features and Functionalities

Guest Profile Management

This feature allows guests to manage their personal information, associated social profiles, and emergency contacts.

Host Profile Management

Hosts can edit their information, such as languages spoken, years of hosting experience, and verification status.

Property Search

Guests may look for properties by location, amenities, price, and other factors.

Booking Management

Guests may view and manage their own reservations, while hosts can see reservations for their properties.



Payment Processing

Secure payment processing with the option to accept multiple payments for a single booking.

Feedback System

A system that allows guests to post reviews for hosts and properties, as well as hosts to evaluate guests.

Referral System

Allows guests to recommend others and measure their progress.

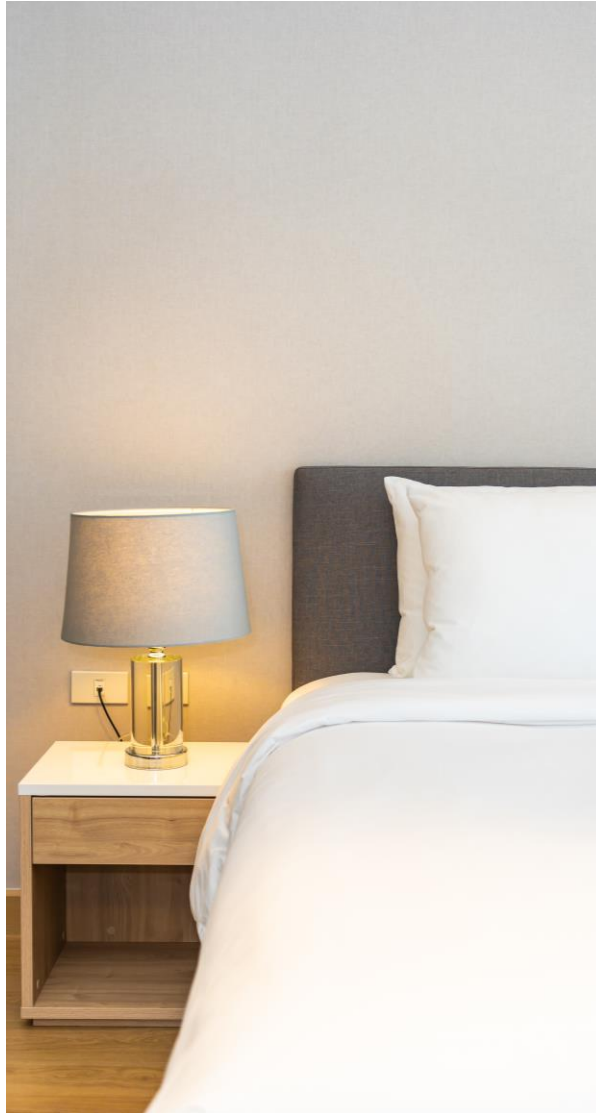
Overview of Business Scenario – Scope of the project

Comprehensive Guest Management

- Maintain a detailed profile of each guest, including personal details, emergency contacts, and linked social accounts.
- Streamline the registration process with identity verification.

Streamlined Booking Process

- Enable guests to make bookings for properties, with details like check-in/check-out dates, companion count, and pricing.
- Allow hosts to receive and manage bookings for their listed properties.



Efficient Property Listings

- Allow hosts to list multiple properties with detailed descriptions, amenities, and location data.
- Facilitate property searches by users based on location, amenities, and other criteria.

Data-Driven Insights

- Analyze guest behavior, booking trends, and review data to make informed business decisions.
- Identify high-performing properties, popular locations, and areas of improvement.
- Scalability and Flexibility: Easily accommodate the addition of new properties, guests, and features as the platform grows.
- Property Performance Metrics:
 - ❖ Occupancy Rates: Identify which properties are booked most frequently and which ones remain vacant.
 - ❖ Seasonal Trends: Understand when properties are in high demand (e.g., holiday seasons, local events).
- Review Sentiment Analysis: Understand the sentiment of reviews. This can help in identifying areas of improvement or highlighting strengths.

Overview of Business Scenario

Guests

Account > Personal info

Personal info

Legal name

Aasna Shah

Edit

Email address

a***2@gmail.com

Edit

Phone numbers

Add a number so confirmed guests and Airbnb can get in touch. You can add other numbers and choose how they're used.

Add

Government ID

Not provided

Add

Address

Not provided


Edit

Emergency contact

Not provided

Add

Hosts




Hosted by Nikolas

Joined in May 2014

★ 4 Reviews

✓ Identity verified

Co-Hosts



Cassandra

Registration number: 310947

Response rate: 100%

Response time: within an hour

Locations


Where Europe

✕


Check in Add dates

Check out Add dates


Search by region




I'm flexible




Europe




United States



Caribbean



Italy



South America

Payments


Bookings


Languages

3


Overview of Business Scenario

Properties

 **Spacious chalet Lac des Sables**
★ 5.0 · 4 reviews · Sainte-Agathe-des-Monts, Quebec, Canada Share Save













Entire home hosted by **Nikolas**
6 guests · 3 bedrooms · 3 beds · 1.5 baths

 **\$171 CAD night** ★ 5.0 · 4 reviews

[Show all photos](#)

Amenities

What this place offers

-  Courtyard view
-  Lake access
-  Wifi
-  Free parking on premises
-  Private hot tub
-  Garden view
-  Kitchen
-  Dedicated workspace
-  Shared outdoor pool – available all year, open 24 hours, heated, infinity
-  Sauna

Overview of Business Scenario

Wishlist Items

Wishlists



Amazing views, 2022
1 saved



Amazing views, 2023
2 saved

Guest Referral

Guest referrals

Track your referrals

Completed referrals 0

Sign-ups 0

Show more details

Overview of Business Scenario

Review by Guest

★ 5.0 · 4 reviews

Cleanliness

5.0

Communication

5.0

Check-in

5.0

Mina

August 2023

Nikolas is friendly and always responsive. We enjoyed our stay in his chalet, you will find everything you need during your stay, the chalet is very Clean and has a wonderful view on th...
[Show more >](#)

Elisabeth

August 2023

Beautiful functional accommodation. Quiet, good location, very well equipped. Very responsive hosts.

Jeremy

August 2023

Amazing hosts, great great place. Hosts are very flexible and nice. Squeaky clean and spacious place. Kitchen is so well equipped. Amazing wifi....
[Show more >](#)

Jessica

August 2023

If there were a 6/5 of stars, I would have put it on! Impeccable accommodation: clean, convenience, beach nearby village everything we needed to make food....
[Show more >](#)

Review by Host

Write & review Judy's group

Friendly-Friendly Chalet NYC

Apartment

Jul 19 - 20, 2024

Describe Your Experience (optional)

Feedback will be posted on your guest's profile.

What was it like to host these guests?

160 characters

Private Guest Feedback

This feedback is just for your guests. We won't make it public.

Thank your guests for staying at your home by leaving them helpful feedback for their next trip.

Cleanliness

How clean was your space when?

★★★★★

Communication

How many did the guests communicate their plans, questions, and concerns?

★★★★★

Observance of House Rules

Did the guests observe the house rules you provided?

★★★★★

Would you recommend these guests?

How would you feel about recommending these guests to your profile?

Yes

No

Reset & create response

Submit

Reference pictures from AIRBNB

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Mission Statement

“The purpose of our databases is to store, maintain and organize data curated by users of our business in order to effectively broker deals between guests looking for a location to stay and hosts offering their space for accommodation.”



Mission Objectives

Maintain

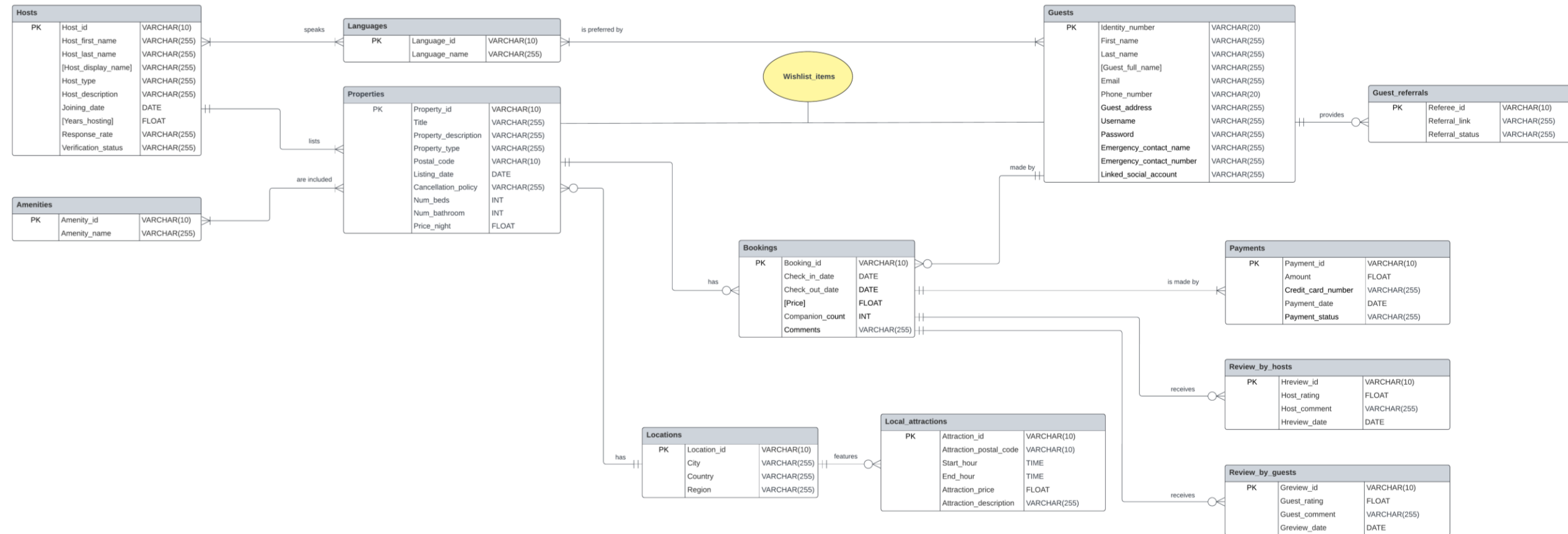
- To maintain (enter, update and delete) data on **Hosts** of properties
- To maintain (enter, update and delete) data on **Properties** being offered for hosting
- To maintain (enter, update and delete) data on **Guests** looking for stays
- To maintain (enter, update and delete) data on **Reviews_by_hosts**
- To maintain (enter, update and delete) data on **Reviews_by_guests**
- To maintain (enter, update and delete) data on **Payments**
- To maintain (enter, update and delete) data on **Bookings**
- To maintain (enter, update and delete) data on **Locations**
- To maintain (enter, update and delete) data on **Amenities** for **Properties**
- To maintain (enter, update and delete) data on **Guest_referrals**
- To maintain (enter, update and delete) data on **Local_attractions**
- To maintain (enter, update and delete) data on **Languages** used by **Guests** and **Hosts**

Mission Objectives

Track & Report

- To track status of **Payments** for **Bookings**
- To track the availability of **Properties**
- To track **guest referral** status
- To report on **guest booking** history
- To report on **guest** information
- To report on **host** information
- To report on **booking** information
- To report **property** offerings based on **location**
- To report on **host** customer reviews
- To report on **guest** customer reviews
- To report on **host** earnings
- To report on **guest** spending
- To report on **location** popularity

ERD Model



ERD Model Assumptions

Guest

- **Guest – Guest referral (One to Many):** Any guest has the option to provide one or multiple referrals, however a referral can only be provided by one guest and is not mandatory.
- **Guest – Property (Many to Many) | Wishlist (relationship attribute):** Any guest can select one or multiple properties for their wishlist, and any property can be selected for one or many guests as a wishlist item.
- **Guest – Booking (One to Many):** Any guest can create one or multiple bookings, however each booking can only be created by one guest. Before booking a property, a guest must check for the dates in which the property is not booked, to know if it's available. Also, it is assumed that each guest must book an entire property, he can't make a partial booking (e.g. book only some rooms).
- **Guest – Language (Many to Many):** Any guest can have one or multiple preferred languages to communicate, and any language can be preferred by one or multiple guests.

Location

- **Location – Attraction Experience (One to Many):** Any location can feature one or multiple attractions, however each attraction can only be featured in a specific location given that attractions are unique in different cities and countries.
- **Location – Property (One to Many):** Any location can have one or multiple properties, however each property can only be situated in one location.

ERD Model Assumptions

Property

- **Property – Booking (One to Many):** Any property can be listed for one or multiple bookings (e.g. a property is booked multiples times throughout the year), however a booking can only be made for one property. Before including a property in the database, its address is verified.
- **Property – Amenities (Many to Many):** Any property can include one or multiple amenities, and any amenity can be included in one or multiple properties.

Host

- **Host – Property (One to Many):** A host can list multiple properties, however each property can only be listed by one host.
- **Host – Language (Many to Many):** Any host can speak one or multiple languages, and any language can be spoken by one or multiple hosts. If a host speaks a certain language, then it means this they is proficient in it (basic or intermediate level is not considered).

Booking

- **Booking – Payments (One to Many):** Any booking can be paid in one or multiple installments, however each payment can only be associated to one booking. It is considered that the common currency for all prices is USD.
- **Booking – Review by Host (One to Many):** In any booking, the host can leave one or multiple reviews about the guest, however each review can only be associated to one booking.
- **Booking – Review by Guest (One to Many):** In any booking, the guest can leave one or multiple reviews about the host, however each review can only be associated to one booking.

Relational Schema Overview

1	Hosts	Hosts (<u>Host_id</u> , Host_first_name, Host_last_name, [Host_display_name], Host_type, Host_description, Joining_date, [Years_hosting], Response_rate, Verification_status) Primary Key: Host_id
2	Languages	Languages (<u>Language_id</u> , Language_name, <u>Host_id</u> , <u>Identity_number</u>) Primary Key: Language_id Foreign Key: Host_id reference Hosts(Host_id) Foreign Key: Identity_number reference Guests(Identity_number)
3	Properties	Properties (<u>Property_id</u> , Title, Property_description, Property_type, Postal_code, Listing_date, Cancellation_policy, Num_beds, Num_bathroom, Price_night, <u>Host_id</u> , <u>Location_id</u>) Primary Key: Property_id Foreign Key: Host_id reference Hosts(Host_id) Foreign Key: Location_id reference Locations(Location_id)
4	Host_languages	Host_languages (<u>Host_id</u> , <u>Language_id</u>) Foreign Key: Host_id reference Hosts(Host_id) Foreign Key: Language_id reference Languages(Language_id)
5	Guests	Guests (Identity_number, First_name, Last_name, [Guest_full_name], Email, Phone_number, Guest_address, Username, Password, Emergency_contact_name, Emergency_contact_number, Linked_social_account, Time_zone) Primary Key: Identity_number

Overview of Relational Schema

6	Guest_referrals	Guest_referrals (Referee_id, Referral_link, Referral_status, Identity_number) Primary Key: Referee_id Foreign Key: Identity_number reference Guests(Identity_number)
7	Guest_languages	Guest_languages (<u>Identity_number</u> , <u>Language_id</u>) Foreign Key: Identity_number reference Guests(Identity_number) Foreign Key: Language_id reference Languages(Language_id)
8	Locations	Location (<u>Location_id</u> , City, Country, Region) Primary Key: Location_id
9	Local_attractions	Local_experiences (Attraction_id, Attraction_postal_code, Start_hour, End_hour, Attraction_price, Attraction_description, Location_id) Primary Key: Attraction_id Foreign Key: Location_id reference Locations(Location_id)
10	Amenities	Amenities (<u>Amenity_id</u> , Amenity_name) Primary Key: Amenity_id
11	Properties_amenities	Properties_Amenities (<u>Property_id</u> , <u>Amenity_id</u>) Foreign Key: Property_id reference Properties(Property_id) Foreign Key: Amenity_id reference Amenities(Amenity_id)

Overview of Relational Schema

12	Wishlist_items	Wishlist_items (Identity_number, Property_id, Wishlist_item) Foreign Key: Identity_number reference Guests(Identity_number) Foreign Key: Property_id reference Properties(Property_id)
13	Bookings	Bookings (Booking_id, Check_in_date, Check_out_date, Price, Companion_count, Comments, Property_id, Identity_number) Primary Key: Booking_id Foreign Key: Property_id reference Properties(Property_id) Foreign Key: Identity_number reference Guests(Identity_number)
14	Payments	Payments (Payment_id, Amount, Credit_card_number, Payment_date, Payment_status, Booking_id) Primary Key: Payment_id Foreign Key: Booking_id reference Bookings(Booking_id)
15	Review_by_hosts	Review_by_hosts (Hreview_id, Host_rating, Host_comment, Hreview_date, Booking_id) Primary Key: Hreview_id Foreign Key: Booking_id reference Bookings(Booking_id)
16	Review_by_guests	Review_by_guests (Greview_id , Guest_rating, Guest_comment, Greview_date, Booking_id) Primary Key: Greview_id Foreign Key: Booking_id reference Bookings(Booking_id)

Queries

Top 5 Most Frequent Booking Months

```
SELECT
    YEAR(b.Check_in_date) AS Year,
    MONTHNAME(b.Check_in_date) AS Month,
    COUNT(b.Booking_id) AS Num_of_bookings
FROM
    Bookings b
GROUP BY
    Year, Month
ORDER BY
    Num_of_bookings DESC
LIMIT 5;
```

Year	Month	Number of Bookings
2022	July	1
2023	March	1
2022	August	1
2023	April	1
2022	September	1

The query retrieves information about the top 5 most frequent booking months. It calculates the number of bookings made in each month, groups the results by year and month, orders the results in descending order based on the number of bookings, and finally limits the output to the top 5 entries.

Queries

Properties with No Bookings in the Last 6 Months

```
SELECT
  p.Title,
  IFNULL(TIMESTAMPDIFF(MONTH,
    MAX(b.Check_in_date), CURDATE()), 'Never
  booked') AS Months_since_last_booking
FROM
  Properties p
LEFT JOIN
  Bookings b ON p.Property_id = b.Property_id
GROUP BY
  p.Property_id, p.Title
HAVING
  MAX(b.Check_in_date) IS NULL
OR Months_since_last_booking > 6;
```

Property Title	Months Since Last Booking
Cozy Downtown Condo	13
Quaint Countryside Cottage	9
Elegant City Mansion	Never booked
Ski-In-Ski-Out Chalet	Never booked
Chic Downtown Loft	Never booked
Historic Riverside Cottage	Never booked
Coastal Retreat House	Never booked

The query identifies properties that have not received any bookings in the last 6 months or have never been booked. It achieves this by calculating the time difference since the last booking for each property and applying appropriate filters to determine which properties meet the specified criteria.

Learning Experience

Highlight the issues and challenges faced during the project

- The creation of a website, connected to a database to display SQL queries was difficult at first as we had great trouble establishing the primary connection

How we resolved those challenges

- The issue with the website was resolved through searching for solutions and instructions online as well as seeking the help and guidance of professor Animesh.

Lessons learnt

- We learned how to resolve challenges associated with connecting a database with a website and also how to display queries on a website.



THANK YOU!