CloudBnB

Group 7: ThunderCloud

Omar Naeem & Alaa Shuaibi
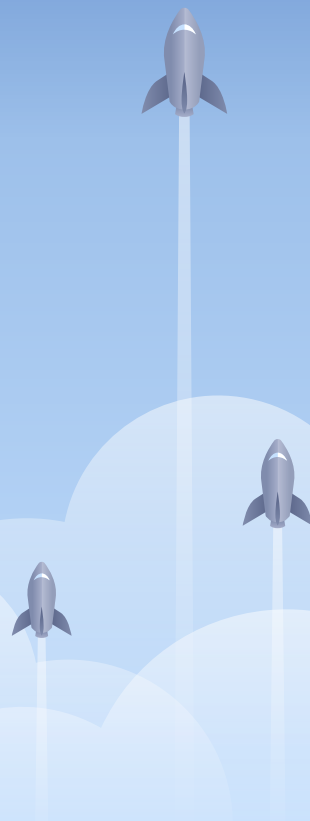
1.
Data Model

Data Model

Dataset: *AirBnB*

Database: *MongoDB*

Selection Reasoning:

➢ Document Model
➢ Data Type Flexibility
➢ Methods for ACID Compliant Transactions
➢ Consistency Options
➢ Well Documented + Community Support
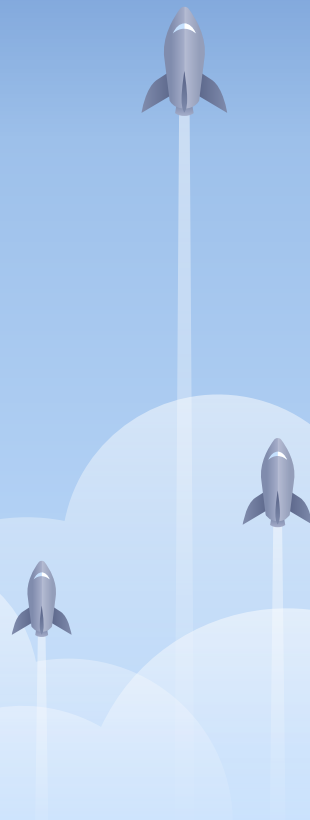
Schema Design

Collections:

➢ Listings
➢ Calendar
➢ Reviews
➢ Neighborhood

Listings

```
  _id: "109"
  accommodates: 6
> amenities: Array
  avg_rating: 4
  city: "los-angeles"
  description: "*** Unit upgraded with new bamboo flooring, brand new Ultra HD 50" Son…"
∨ host_info: Object
    host_id: "521"
    host_url: "https://www.airbnb.com/users/show/521"
    host_name: "Paolo"
    host_image: "https://a0.muscache.com/im/pictures/user/e704ac44-5bfc-408e-90f8-c2763…"
  listing_image: "https://a0.muscache.com/pictures/4321499/1da9892a_original.jpg"
  listing_name: "Amazing bright elegant condo park front *UPGRADED*"
  listing_url: "https://www.airbnb.com/rooms/109"
  neighborhood: "Culver City"
  price: "$115.00"
  property_type: "Entire condominium (condo)"
  room_type: "Entire home/apt"
  total_reviews: 2
```

Calendar

```
_id: "109"
v availability_periods: Array
  v 0: Object
      start_date: 2021-12-06T00:00:00.000+00:00
      end_date: 2021-12-06T00:00:00.000+00:00
      available: false
      total_nights: 1
  > 1: Object
  > 2: Object
  > 3: Object
  > 4: Object
  > 5: Object
  v 6: Object
      start_date: 2022-04-24T00:00:00.000+00:00
      end_date: 2022-07-21T00:00:00.000+00:00
      available: true
      total_nights: 89
  > 7: Object
  max_nights: 730
  min_nights: 30
```

Reviews

```
_id: "109"
∨ comments: Array
  ∨ 0: Object
      reviewer_id: "927861"
      reviewer_name: "Edwin"
      date: 2011-08-15T00:00:00.000+00:00
      comments: "The host canceled my reservation the day before arrival."
  ∨ 1: Object
      reviewer_id: "22509885"
      reviewer_name: "Jenn"
      date: 2016-05-15T00:00:00.000+00:00
      comments: "Me and two friends stayed for four and a half months. It was a great p…"
```
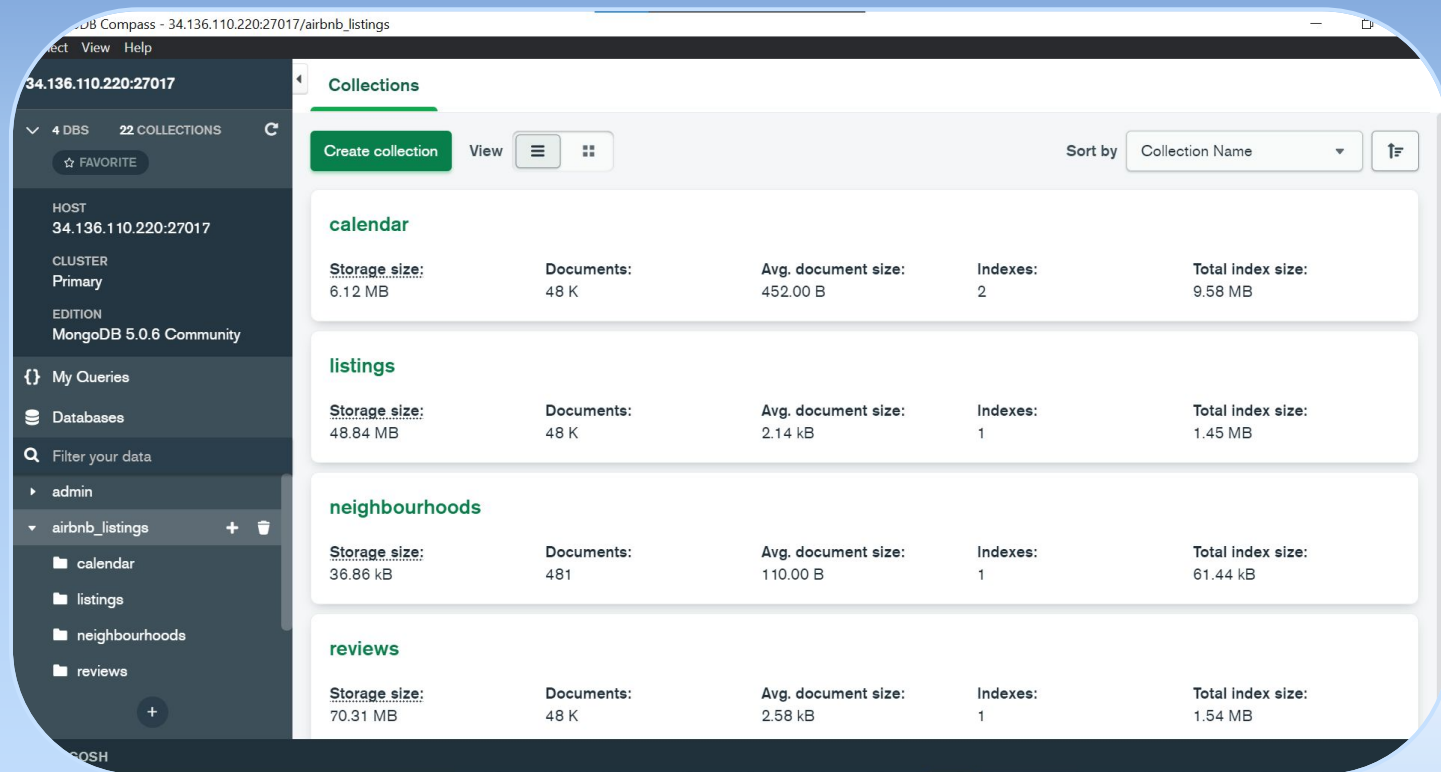
Neighborhoods

_id: ObjectId('6271bb01526f7a5ca66e2f9e')
city: "los-angeles"
neighbourhood_group: "City of Los Angeles"
neighbourhood: "Adams-Normandie"

_id: ObjectId('6271bb01526f7a5ca66e2f9f')
city: "los-angeles"
neighbourhood_group: "City of Los Angeles"
neighbourhood: "Arleta"

_id: ObjectId('6271bb01526f7a5ca66e2fa0')
city: "los-angeles"
neighbourhood_group: "City of Los Angeles"
neighbourhood: "Arlington Heights"

Data Storage

2.
MongoDB Queries

Query #1

*Display the **listings available** for a particular **two-day period** for Portland, OR with details*

Query Syntax: *https://github.com/alaa-shuaibi/CloudBnB/blob/main/queries.md*

Query #3

*For each "Entire home/apt" type listings in Salem, provide its **availability periods** for a particular month – which chunks of time are bookable?*

Query Syntax: https://github.com/alaa-shuaibi/CloudBnB/blob/main/queries.md

Query #4

*For "Entire home/apt" type listings in Portland provide the **total number of available nights** between March and August*

Query Syntax: *https://github.com/alaa-shuaibi/CloudBnB/blob/main/queries.md*
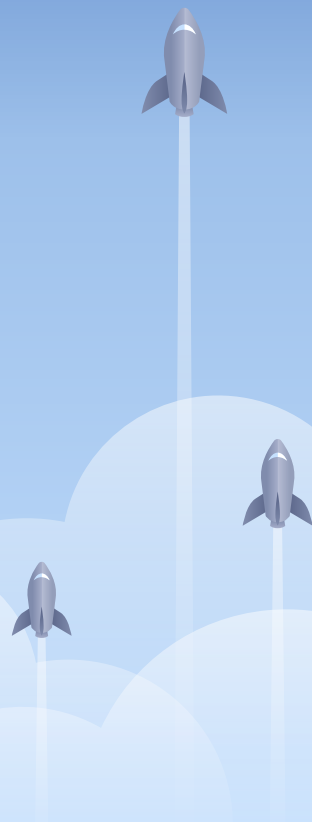
3.
Critique

Critique

Changes Made:

▷ Altered structure of Reviews schema to have listings be represented by one document.

Changes We Would Make If We Started Over:

▷ Merge availability periods together (to reduce redundancy in data)
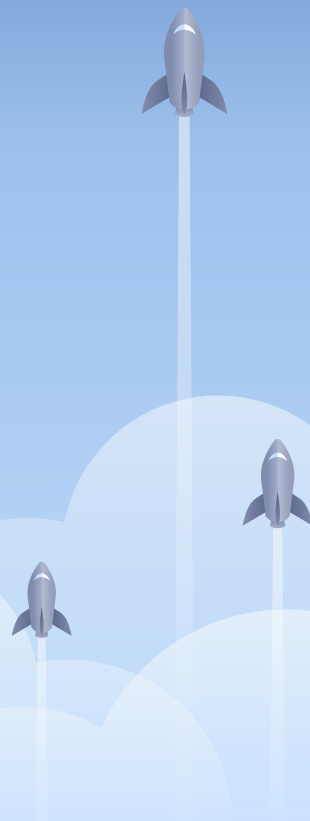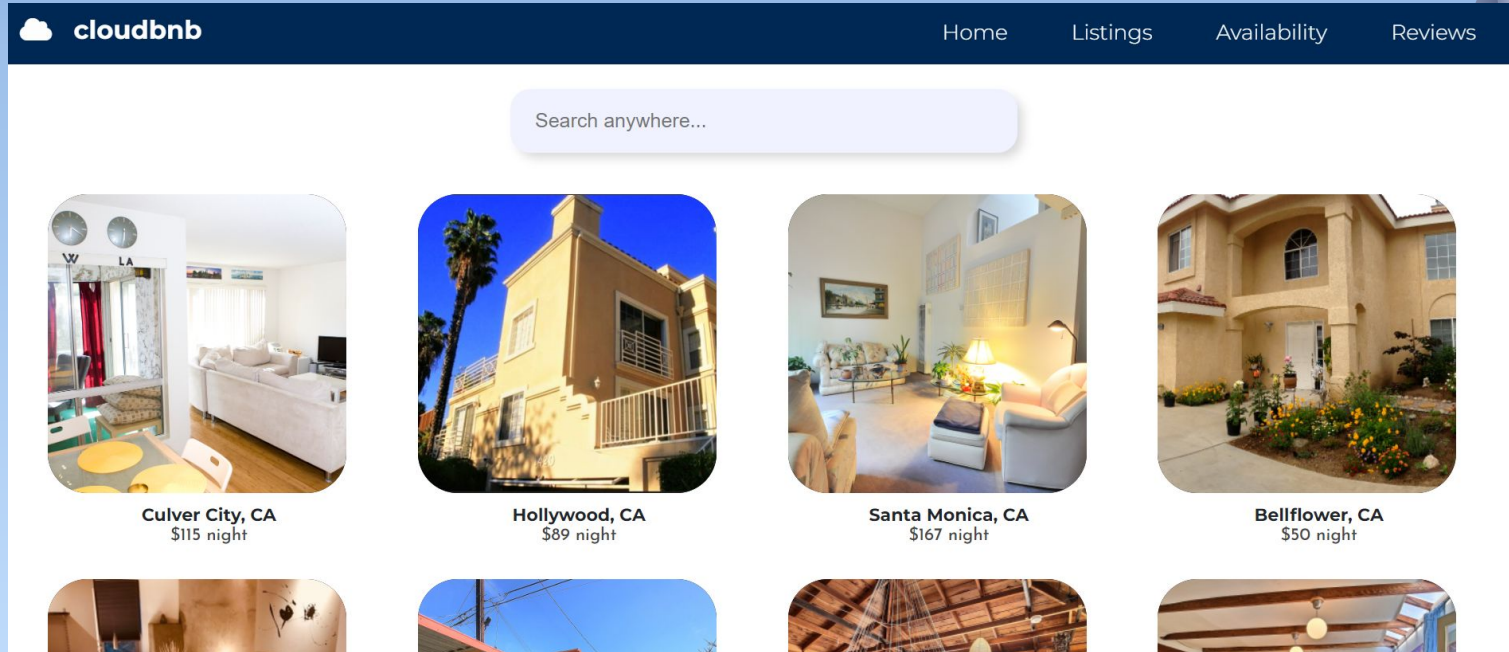▷ Experiment more with indexing, consistency, and other features of MongoDB.

4.
Lessons Learned

Lessons Learned

➢ RDBMS vs NoSQL mindset
➢ How to determine which database and data model is best for specific use cases.
➢ How to design schemas to achieve optimal performance on queries.
➢ How to efficiently preprocess data.
➢ How to perform various complex queries in MongoDB.

Front-End Component

GitHub Repository

➤ **https://github.com/alaa-shuaibi/CloudBnB**
➤ Includes:
  ▷ Queries
  ▷ Data Storage Statistics
  ▷ Python Preprocessing Code
  ▷ Front-End Code

Thank You!