REAL ESTATE AGENCY LISTING WEBSITE

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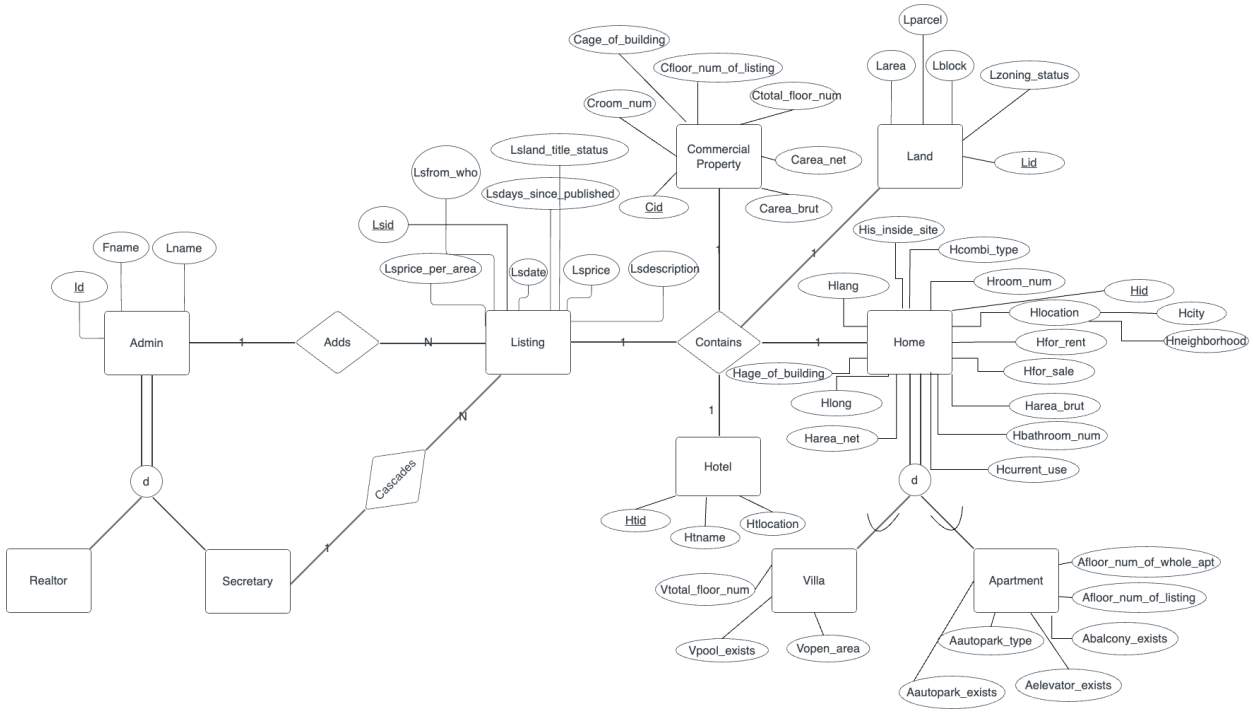
Project Description

We developed a comprehensive real estate agency listings website utilizing a robust database management system. The system efficiently manages property listings, incorporating various attributes and relationships unique to each listing. Additionally, the project includes a secure authentication system and admin features, implemented through a ReactJS + NodeJS + MySQL stack to ensure seamless functionality and a user-friendly experience.

Entity-Relationship Diagram



Relational Database Design

```
CREATE TABLE Admin (
    Id INT NOT NULL,
    Fname VARCHAR(30),
    Lname VARCHAR(30),
    PRIMARY KEY (Id)
);

CREATE TABLE Home (
    Hid INT NOT NULL,
    Hroom_num VARCHAR(16),
    Hcity VARCHAR(255),
    Hneighborhood VARCHAR(255),
    Hfor_rent BOOLEAN,
    Hfor_sale BOOLEAN,
    Harea_brut REAL,
```

```
    Hcombi_type VARCHAR(128),
    Hlang REAL,
    Hlong REAL,
    Harea_net REAL,
    Hage_of_building INT,
    Hbathroom_num INT,
    His_inside_site BOOLEAN,
    Hcurrent_use VARCHAR(255),
    PRIMARY KEY(Hid)
);

CREATE TABLE Listing (
    Lsid INT NOT NULL,
    Lsdate DATE,
    Lsdays_since_published INT,
    Lsprice REAL,
    Lsprice_per_area REAL,
    Lsfrom_who VARCHAR(90),
    Lsland_title_status VARCHAR(128),
    Lsdescription VARCHAR(500),
    Id INT,
    PRIMARY KEY (Lsid),
    FOREIGN KEY (Id) REFERENCES Admin(Id)
);

-- Continue with tables having foreign key dependencies
CREATE TABLE Land (
    Lid INT NOT NULL,
    Larea REAL,
    Lblock VARCHAR(50),
    Lparcel VARCHAR(50),
    Lzoning_status VARCHAR(50),
    PRIMARY KEY(Lid)
);

CREATE TABLE Hotel (
    Htid INT NOT NULL,
    Htname VARCHAR(255),
    Htlocation VARCHAR(255),
    PRIMARY KEY(Htid)
);

CREATE TABLE Commercial_Property (
    Cid INT NOT NULL,
    Cfloor_num_of_listing INT,
    Ctotal_floor_num INT,
    Carea_net REAL,
    Carea_brut REAL,
    Cage_of_building INT,
    Croom_num INT,
    PRIMARY KEY(Cid)
);

CREATE TABLE Apartment (
       Hid INT NOT NULL,
```

```
    Afloor_num_of_whole_apt INT,
    Afloor_num_of_listing INT,
    Abalcony_exists BOOLEAN,
    Aelevator_exists BOOLEAN,
    Aautopark_type VARCHAR(50),
    Aautopark_exists BOOLEAN,
    PRIMARY KEY(Hid),
    FOREIGN KEY (Hid) REFERENCES Home(Hid)
);

CREATE TABLE Villa (
       Hid INT NOT NULL,
    Vpool_exists BOOLEAN,
    Vtotal_floor_num INT,
    Vopen_area REAL,
    PRIMARY KEY(Hid),
    FOREIGN KEY (Hid) REFERENCES Home(Hid)
);

CREATE TABLE Realtor (
       Id INT NOT NULL,
    PRIMARY KEY(Id),
    FOREIGN KEY (Id) REFERENCES Admin(Id)
);

CREATE TABLE Secretary (
       Id INT NOT NULL,
    PRIMARY KEY(Id),
    FOREIGN KEY (Id) REFERENCES Admin(Id)
);

CREATE TABLE Contains (
    Lsid INT,
    Hid INT,
    Cid INT,
    Htid INT,
    Lid INT,
    PRIMARY KEY(Lsid),
    FOREIGN KEY (Lsid) REFERENCES Listing(Lsid),
    FOREIGN KEY (Hid) REFERENCES Home(Hid),
    FOREIGN KEY (Cid) REFERENCES Commercial_Property (Cid),
    FOREIGN KEY (Htid) REFERENCES Hotel(Htid),
    FOREIGN KEY (Lid) REFERENCES Land(Lid)
);
```

Data Sources

We populated our database according to real entries from “sahibinden.com”. There are 8 tuples in apartments. There are 3 tuples in admin. There are 1 tuple in commercial property. There are 14 tuples in contains. There are 10 tuples in home. There are 1 in the hotel.There are 2 in land. There are 14 in listing. There are 3 in realtor. There are 1 in secretary. There are 2 in villa. Our insert statements can be found in db_populate.py .

Advanced SQL Queries

1- This query retrieves all the details of listings (including home, land, hotel, and commercial property information) along with the corresponding admin information. This has been integrated in the buy page of our website. When one of the entries at the right is clicked, it navigates to a page about the listing with the corresponding id. The navigated page shows all the details for that listing using this query. This is useful for our project for realtors and customers to see all the information about a listing, whether it is a home or a hotel or anything else, in one page.

```
SELECT *
FROM Listing
JOIN Contains ON Listing.Lsid = Contains.Lsid
LEFT JOIN Home ON Contains.Hid = Home.Hid
LEFT JOIN Land ON Contains.Lid = Land.Lid
LEFT JOIN Hotel ON Contains.Htid = Hotel.Htid
LEFT JOIN Commercial_Property ON Contains.Cid = Commercial_Property.Cid
JOIN Admin ON Listing.Id = Admin.Id;
```

2- This query finds the average price per area for each property type (Home, Land, Hotel, Commercial Property). This has been integrated in the Analytics part of the real estate agency listings website. This is useful in our project because it provides data analytics for companies' realtors. Displaying the average price of an area will be useful for looking for a cost-efficient property for customers.

```
SELECT
      CASE
         WHEN Home.Hid IS NOT NULL THEN 'Home'
         WHEN Land.Lid IS NOT NULL THEN 'Land'
         WHEN Hotel.Htid IS NOT NULL THEN 'Hotel'
         WHEN Commercial_Property.Cid IS NOT NULL THEN 'Commercial Property'
      END AS property_type,
      AVG(Listing.Lsprice_per_area) AS avg_price_per_area
   FROM Listing
   LEFT JOIN Contains ON Listing.Lsid = Contains.Lsid
   LEFT JOIN Home ON Contains.Hid = Home.Hid
   LEFT JOIN Land ON Contains.Lsid = Land.Lid
   LEFT JOIN Hotel ON Contains.Lsid = Hotel.Htid
   LEFT JOIN Commercial_Property ON Contains.Lsid = Commercial_Property.Cid
   GROUP BY property_type;
```

3- This query returns the homes with above average price in their neighborhood. This has been integrated in the Analytics part of the real estate agency listings website. This is useful in our project because it provides data analytics for companies' realtors. As data grows, the benefits will become much more essential. Showing the average price of a neighborhood will be useful for finding the right property for customers who have a high budget and want to live in the best property in an area.

```
SELECT Home.Hid, Home.Hneighborhood, Listing.Lsprice
FROM Home
JOIN Contains ON Home.Hid = Contains.Hid
JOIN Listing ON Contains.Lsid = Listing.Lsid
WHERE Listing.Lsprice > (
   SELECT AVG(L.Lsprice)
   FROM Home H
   JOIN Contains C ON H.Hid = C.Hid
   JOIN Listing L ON C.Lsid = L.Lsid
   WHERE H.Hneighborhood = Home.Hneighborhood
)
ORDER BY Home.Hneighborhood, Listing.Lsprice DESC;
```

4- This query finds the total number of listings for each city.This has been integrated in the Analytics part of the real estate agency listings website. This is useful in our project because it provides data analytics for companies' realtors which can result in an improved decision making process. This query will help the realtor to keep track of properties that are on sale or on rent in each city and customers to know how many options they have.

```
   SELECT Hcity, COUNT(*) AS total_listings
   FROM Listing
   JOIN Contains ON Listing.Lsid=Contains.Lsid
   JOIN Home ON Contains.Hid = Home.Hid
   GROUP BY Hcity;
```

5- This query displays the cities that have more than two listings for homes with a brut area larger than 140. This has been integrated in the Analytics part of the real estate agency listings website. This is useful in our project because it provides data analytics for companies' realtors. Knowing the cities that have more large houses can direct the realtor to display more listings from those cities, if the target customers prefer large houses.

```
SELECT Home.Hcity, COUNT(Listing.Lsid) AS NumberOfListings
FROM Home
JOIN Contains ON Home.Hid = Contains.Hid
JOIN Listing ON Contains.Lsid = Listing.Lsid
```

```
WHERE Home.Harea_brut > 140
GROUP BY Home.Hcity
HAVING COUNT(Listing.Lsid) > 2;
```

6- This query finds the average listing price of homes which have more than two bathrooms and are inside a site. This has been integrated in the Analytics part of the real estate agency listings website. This is useful in our project because it provides data analytics for companies' realtors.

```
SELECT
   AVG(Listing.Lsprice) AS AveragePrice,
   Home.Hbathroom_num,
   Home.His_inside_site
FROM Home
JOIN Contains ON Home.Hid = Contains.Hid
JOIN Listing ON Contains.Lsid = Listing.Lsid
GROUP BY Home.Hbathroom_num, Home.His_inside_site
HAVING Home.Hbathroom_num >= 2 AND Home.His_inside_site = 1;
```

7- The below query finds top 5 largest homes for sale in the city.This has been integrated in the Analytics part of the real estate agency listings website. This is useful in our project because it provides data analytics for companies' realtors.

```
SELECT Home.Hcity, Home.Hid, Home.Harea_brut, Home.Hroom_num
FROM Home
JOIN Contains ON Home.Hid = Contains.Hid
JOIN Listing ON Contains.Lsid = Listing.Lsid
WHERE Home.Hfor_sale = TRUE
ORDER BY Home.Hcity, Home.Harea_brut DESC
LIMIT 5;
```

8- Shows which homes are for sale. This is useful for the customers who do not want to rent but buy a house.

```
SELECT *
FROM Home
WHERE Hfor_sale = TRUE;
```

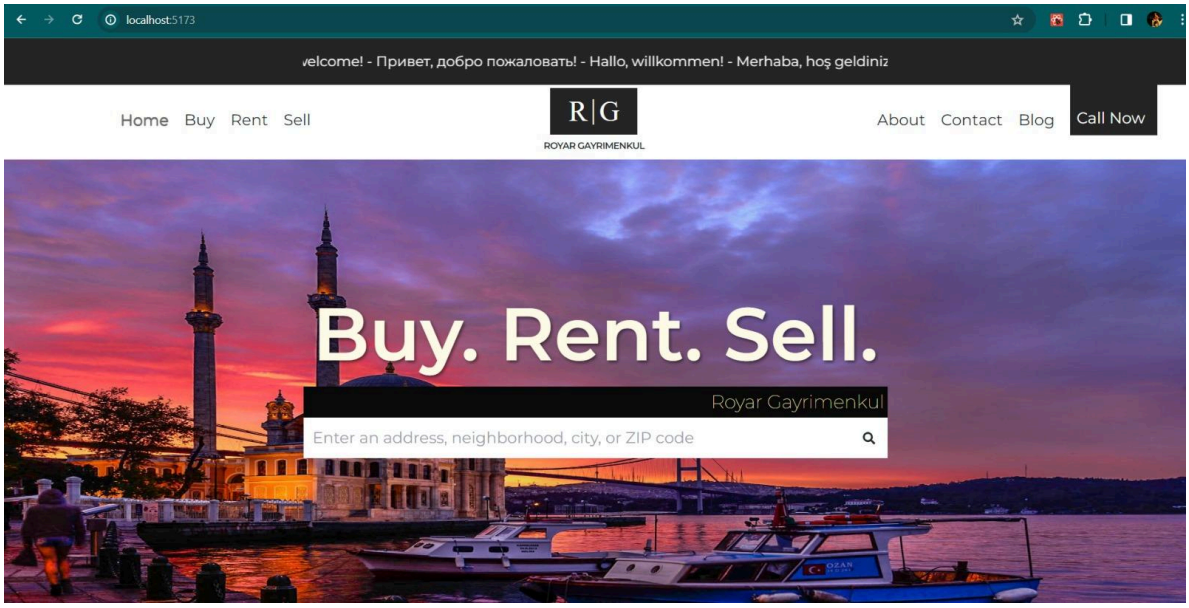
9- This query shows the average price in listings for each neighborhood. This has been integrated in the Analytics part of the real estate agency listings website. This is useful for our project because the realtors can inform the customers about the average prices for each neighborhood so that the customers can decide on a neighborhood of their choice.

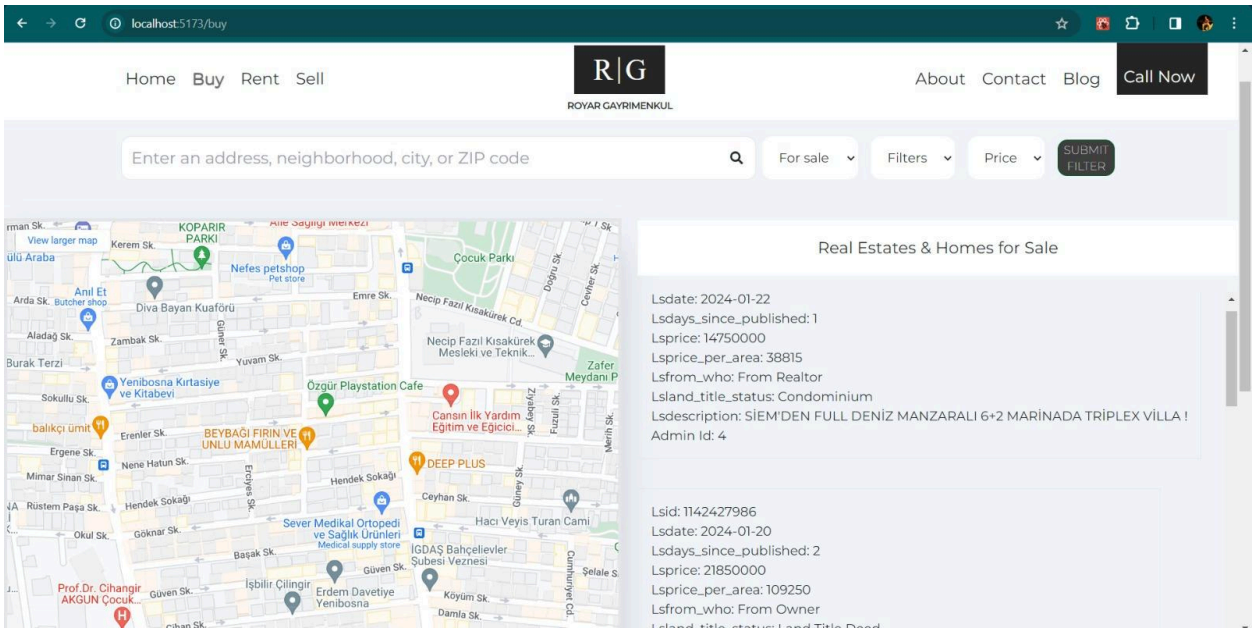
```
SELECT Home.Hneighborhood, AVG(Listing.Lsprice) AS AvgPrice
```

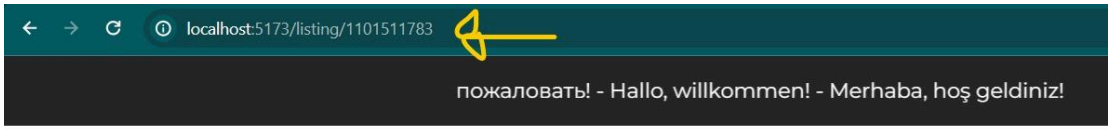
```
FROM Listing
JOIN Contains ON Listing.Lsid = Contains.Lsid
JOIN Home ON Contains.Hid = Home.Hid
GROUP BY Home.Hneighborhood;
```

Screenshots

Front-end







Home Buy Rent Sell

R|G
ROYAR GAYRIMENKUL

SİEM'DEN FULL DENİZ MANZARALI 6+2 MARİNADA TRİPLEX VİLLA !
Date: 2024-01-22
Days Since Published: 1
Price: 14750000
Price per Area: 38815
From Who: From Realtor
Land Title Status: Condominium
Home ID: 4
Commercial Property ID: 1101511783
Home Room Number: 1101511783
Home City: 6+2
Home Neighborhood: Istanbul
Home For Rent: Beylikdüzü
0
Home Area Brut: 1
Home Combi Type: 400
Home Language: Kombi
Home Longitude: 40.985882
Home Latitude: 28.630224
Home Area Net: 380
0
Home Bathroom Number: 6
Home Is Inside Site: 1
Home Current Use: empty


Home Buy Rent Sell
R|G
ROYAR GAYRIMENKUL
About Contact Blog Call Now
Analytics
Average Price per Area
Homes Above Average Price in Neighborhood
Total Listings per City
Average Price of Homes with More Than Two Bathrooms and Inside Site
Cities More Than Two Home Listings With Brut Area More Than 140
Top Five Largest Homes For Sale in City
Average Price of Listings For Each Existing Neighborhood
Result:
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Home Buy Rent Sell
R|G
ROYAR GAYRIMENKUL
About Contact Blog Call Now
Analytics
Average Price per Area
Homes Above Average Price in Neighborhood
Total Listings per City
Average Price of Homes with More Than Two Bathrooms and Inside Site
Cities More Than Two Home Listings With Brut Area More Than 140
Top Five Largest Homes For Sale in City
Average Price of Listings For Each Existing Neighborhood
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"4+2"
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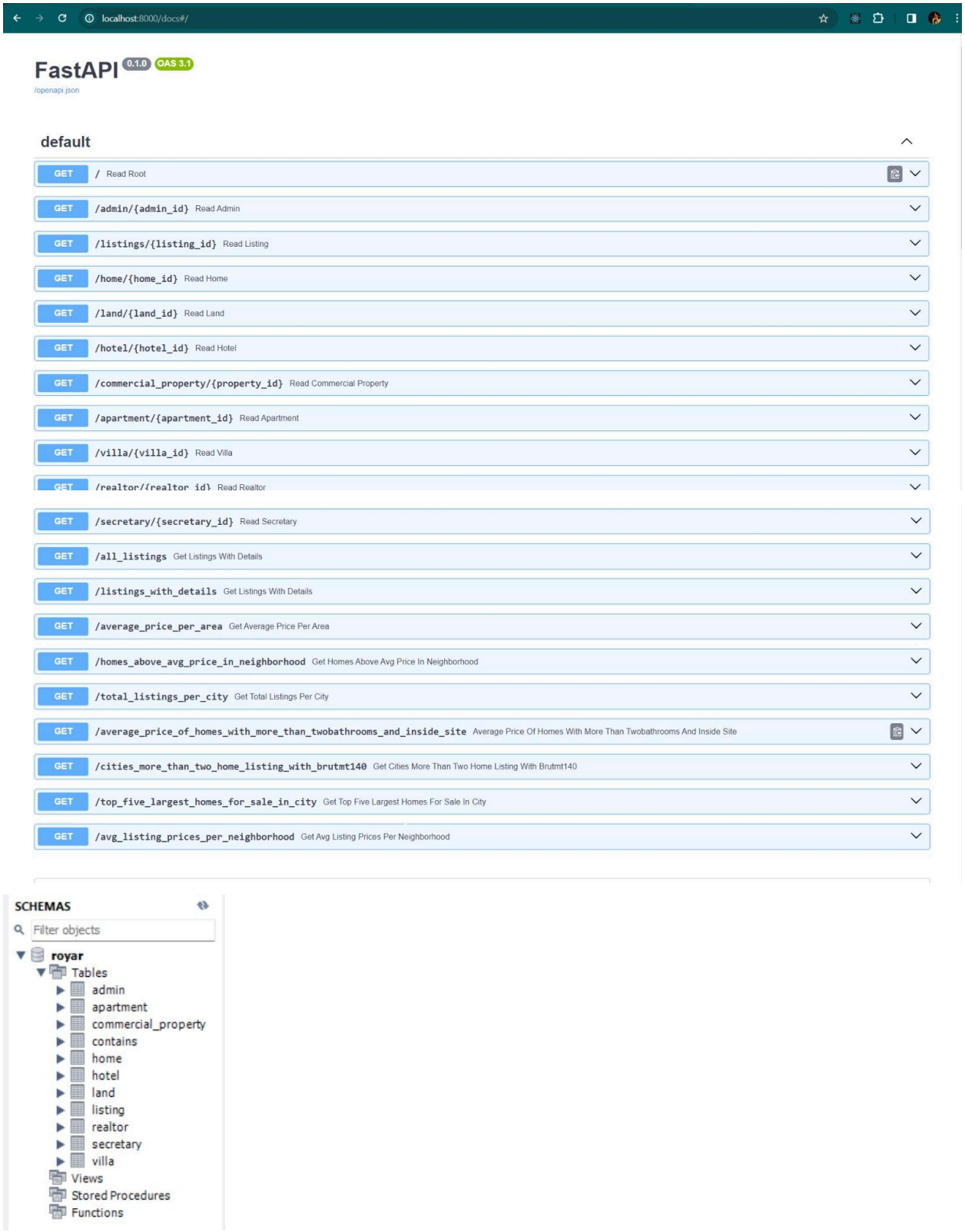
"Antalya",
1149450314,

Back-end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FastAPI
0.1.0
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default
GET / Read Root
GET /admin/{admin_id} Read Admin
GET /listings/{listing_id} Read Listing
GET /home/{home_id} Read Home
GET /land/{land_id} Read Land
GET /hotel/{hotel_id} Read Hotel
GET /commercial_property/{property_id} Read Commercial Property
GET /apartment/{apartment_id} Read Apartment
GET /villa/{villa_id} Read Villa
GET /realtor/{realtor_id} Read Realtor
GET /secretary/{secretary_id} Read Secretary
GET /all_listings Get Listings With Details
GET /listings_with_details Get Listings With Details
GET /average_price_per_area Get Average Price Per Area
GET /homes_above_avg_price_in_neighborhood Get Homes Above Avg Price In Neighborhood
GET /total_listings_per_city Get Total Listings Per City
GET /average_price_of_homes_with_more_than_twobathrooms_and_inside_site Average Price Of Homes With More Than Twobathrooms And Inside Site
GET /cities_more_than_two_home_listing_with_brutmt140 Get Cities More Than Two Home Listing With Brutmt140
GET /top_five_largest_homes_for_sale_in_city Get Top Five Largest Homes For Sale In City
GET /avg_listing_prices_per_neighborhood Get Avg Listing Prices Per Neighborhood

SCHEMAS
Filter objects
royar
Tables
admin
apartment
commercial_property
contains
home
hotel
land
listing
realtor
secretary
villa
Views
Stored Procedures
Functions