

# Housing Market Analysis

Exploring Housing Prices,  
Amenities, and Trends in Austin, TX



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# AGENDA

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Project Plan

Data Sources

Challenges & Limitations

Flask API

Front-End Development

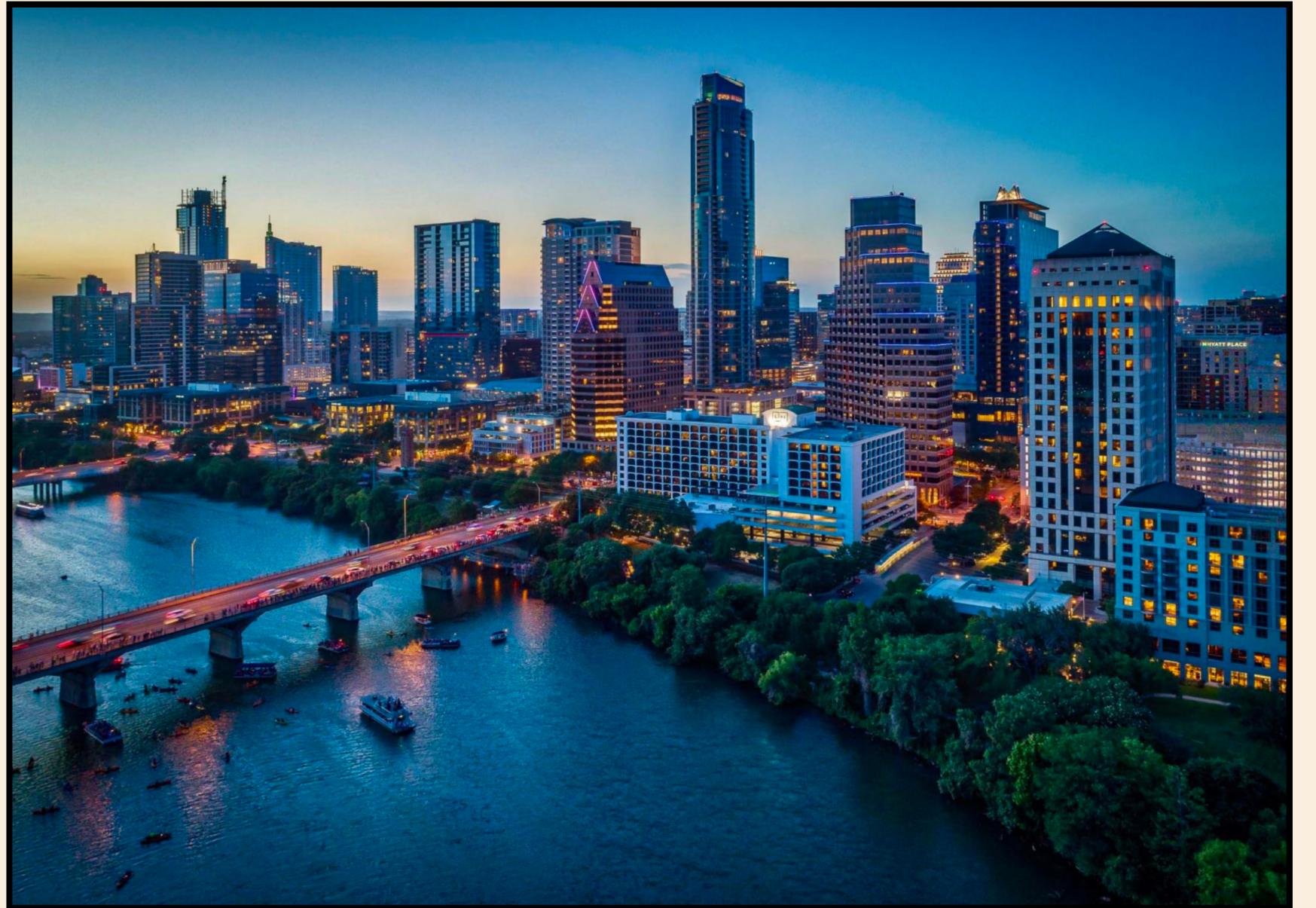
Visualizations & Demo

Conclusions

Q&A



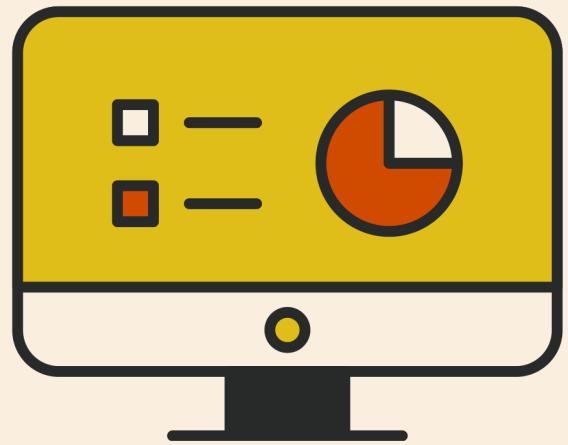
# Introduction



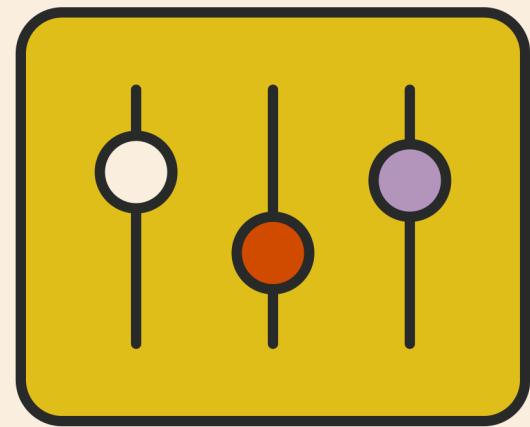
Our project focuses on exploring housing market trends in Austin, TX - one of the fastest growing cities in the USA according to CNBC - examining factors such as housing prices, property types, and nearby amenities.

Looking at the booming Austin Metropolitan Area and the ongoing market for properties. This website would provide a structure where individuals moving to Austin would be able to see schools, grocery stores, public transit, restaurants, gyms and parks around properties in the market.

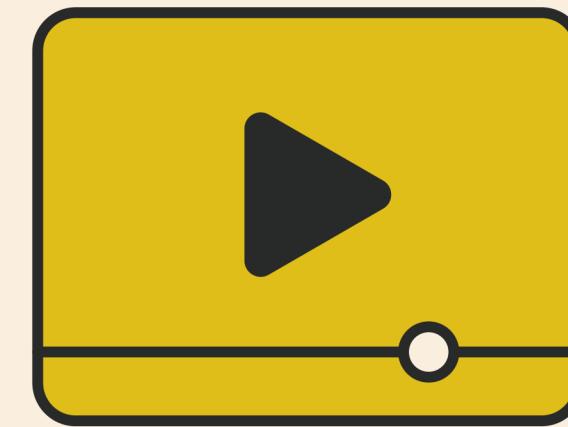
# Project Plan



ATTOM API  
Yelp API



PostgreSQL Database  
Flask API



User interaction  
Data aggregation  
Visualization

# Project Plan

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- What are the trends in housing prices in the Austin Metropolitan Area?
- How do the prices vary based on the proximity to schools, grocery stores, and other amenities?
- Can we identify patterns in housing features and prices within the same area?
- Are there clusters of houses with similar amenity patterns?

# Data Sources

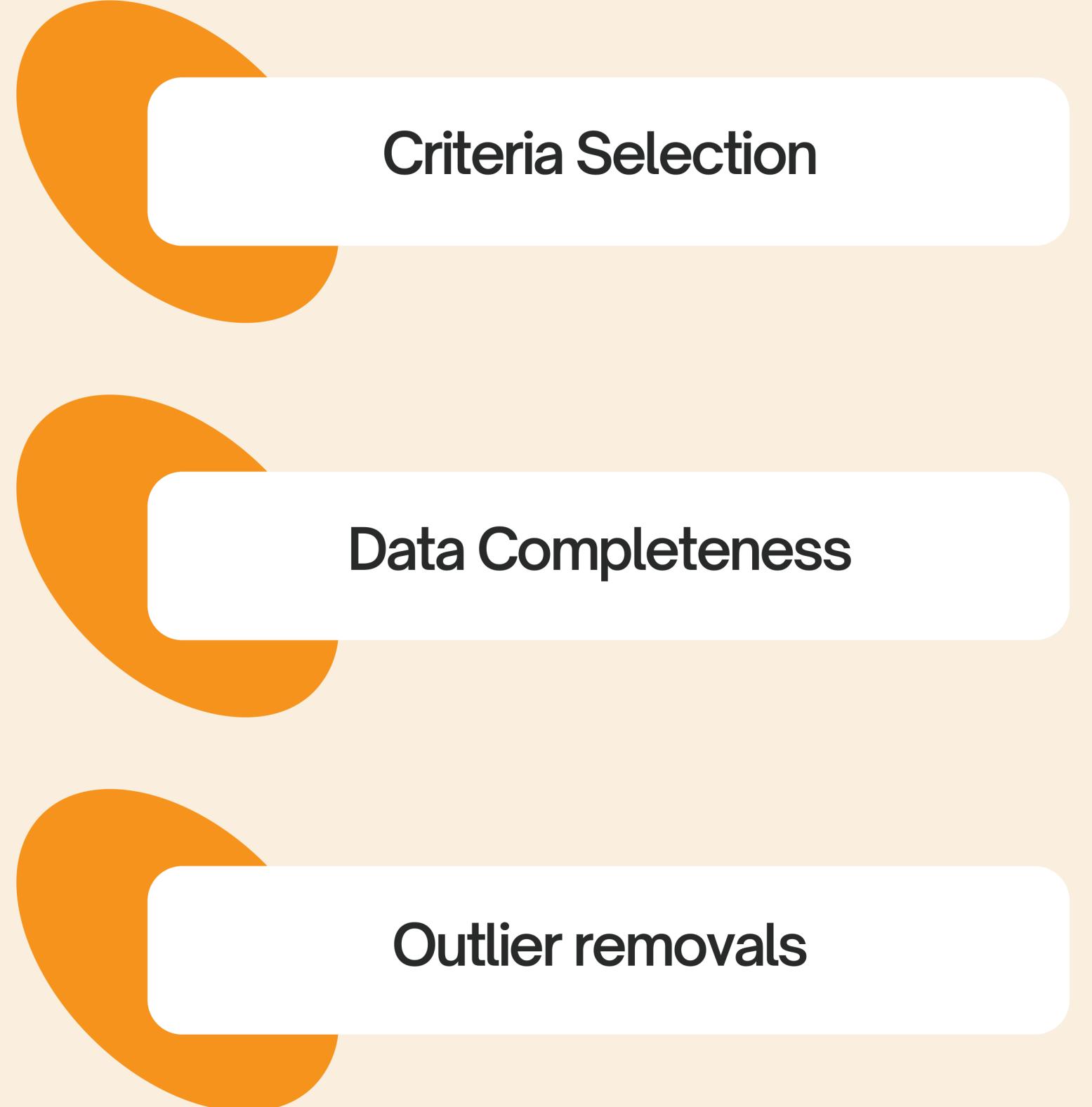
For up-to-date information about market prices and sales of ongoing listing in Austin Mtropolitan Area, an API was required.

<b>Data Sources</b>	<ul style="list-style-type: none"><li>• ATTOM API</li><li>• Yelp API</li></ul>
<b>Sample Size</b>	<ul style="list-style-type: none"><li>• Over 40,000 properties currently on the market</li><li>• Over 2,000 businesses</li></ul>
<b>Geographical Location</b>	<ul style="list-style-type: none"><li>• Austin Metropolitan Area, Texas</li></ul>
<b>Data Cleaning</b>	<ul style="list-style-type: none"><li>• Cleaning and removing outliers</li></ul>
<b>Database</b>	<ul style="list-style-type: none"><li>• PostgreSQL</li></ul>
<b>API</b>	<ul style="list-style-type: none"><li>• Flask</li></ul>

# Data Sources

The details and steps used during the ETL process to ensure a robust and relevant dataset.

- What?
- Why?
- How?



Criteria Selection

Data Completeness

Outlier removals

# Data Sources

Captured visualizations highlighting the outlier removals from the property data frames.

## Property size to room ratio

square_foot	bedrooms	bathrooms
974	840	4
984	480	3
1064	480	3
1144	648	3
1145	576	3

# Data Sources

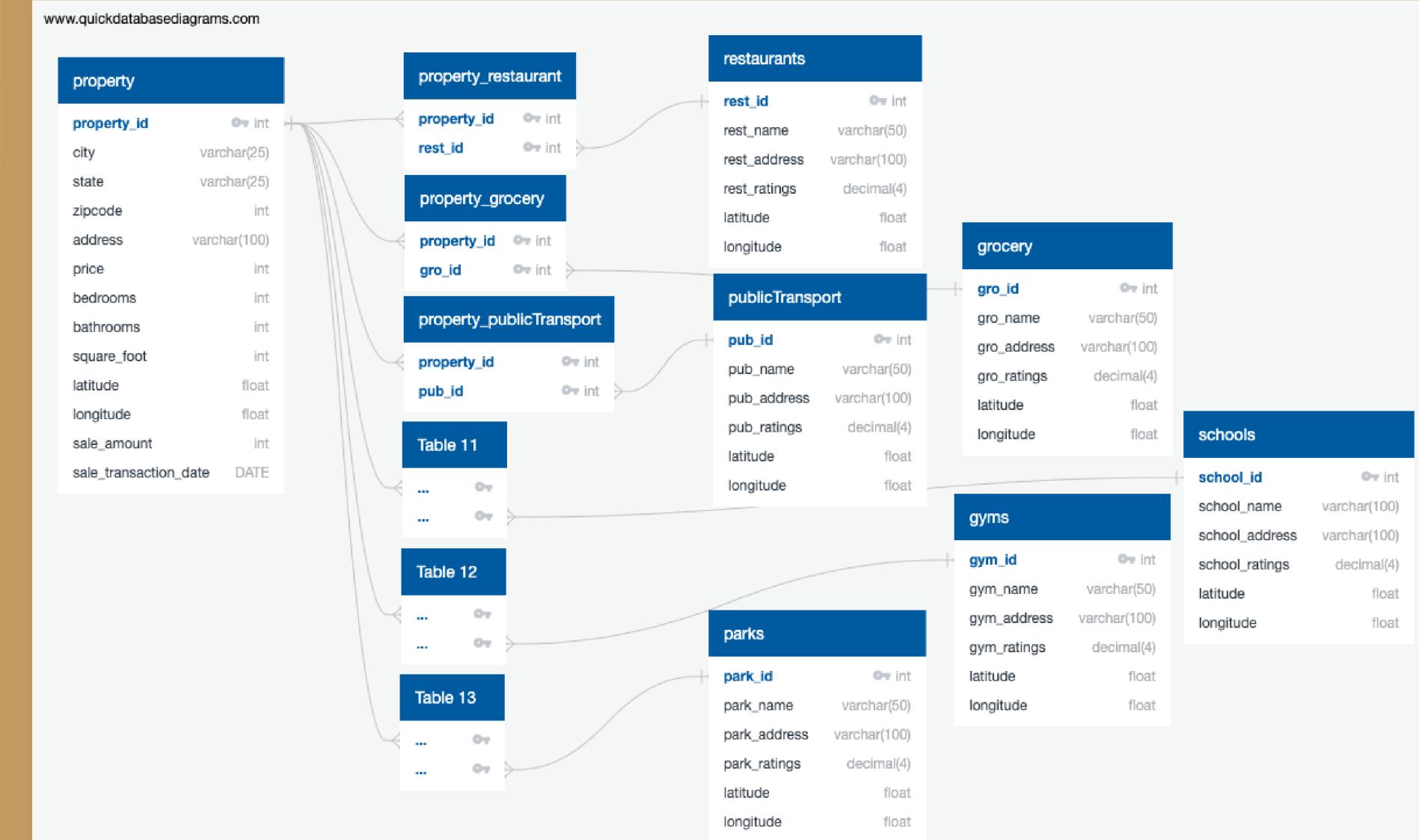
Captured visualizations highlighting the outlier removals from the property data frames.

## Yearly price change

	sale_transaction_date	sale_amount	price
4572	2023-06-09	3063	4833563
28	2022-02-08	1250	741046
4159	2023-10-02	15953	450080
3477	2021-07-08	6250	1897071
6659	2023-09-15	367318	6754950

# Challenges & Limitations

Throughout our project journey, we encountered a few challenges that tested our problem-solving skills and teamwork.



# Flask-API

## Overview

Flask serves as the backbone of this application, handling both HTML rendering for web pages and JSON data for API endpoints. The flask was able to provided a visual view of what the website was to produce. It showed the properties(prices, bedrooms etc), the amenities close by and the rating of those amenities.

```
[{"latitude": 30.2713915350908, "longitude": -97.7440630452746, "publictransport_address": "209 W 9th St, Ste 100, Austin, TX 78701", "publictransport_id": 1, "publictransport_name": "Capital Metro", "publictransport_ratings": 2.0}, {"latitude": 30.34838, "longitude": -97.71251, "publictransport_address": "N Lamar Blvd And Research Blvd, Austin, TX 78758", "publictransport_id": 2, "publictransport_name": "North Lamar Transit Center", "publictransport_ratings": 2.0}, {"latitude": 30.58769, "longitude": -97.8559, "publictransport_address": "800 N US Hwy 183, Leander, TX 78641", "publictransport_id": 3, "publictransport_name": "MetroRail - Leander Station", "publictransport_ratings": 5.0}, {"latitude": 30.2715418, "longitude": -97.7401939, "publictransport_address": "1000 Brazos St, Ste 100, Austin, TX 78701", "publictransport_id": 4, "publictransport_name": "Metrobike Austin", "publictransport_ratings": 2.0}, {"latitude": 30.3286986922504, "longitude": -97.7161833335162, "publictransport_address": "6400 Airport Blvd, Austin, TX 78752", "publictransport_id": 5, "publictransport_name": "Highland Metrorail Station", "publictransport_ratings": 3.0}, {"latitude": 30.26136, "longitude": -97.72037, "publictransport_address": "2010 E 6th St, Austin, TX 78702", "publictransport_id": 6, "publictransport_name": "Carts", "publictransport_ratings": 1.0}]
```

# Front-End Development

```
<nav>
  <div class="search-container">
    <label for="zipcode">Zip Code:</label>
    <select id="zipcode">
      <!-- Options will be populated dynamically -->
    </select>
    <label for="bedrooms">Number of Bedrooms:</label>
    <select id="bedrooms">
      <!-- Options will be populated dynamically -->
    </select>
    <button onclick="searchProperties()">Search</button>
  </div>
  Property Recommendation in Texas USA. Group#9 Jorge,Omar,Chisom,Muhammad</nav>
<div class="details-container" id="details">
  <!-- Property details will be displayed here on click -->
</div>
<div id="barChart">Sales History</div>
<div id="amenities">Amenities</div>
<div id="map">Area Map</div>
<div id="recommendations">Recommendations</div>
<!-- Side bar customization -->
<div id="sideBar">

  <div id="result-box">
    <div class="results-container" id="results">
      <!-- Results will be displayed here -->
    </div>
  </div>
</div>
```

```
// Function to display search results
async function searchProperties() {
  const zipCode = document.getElementById('zipcode').value;
  const bedrooms = document.getElementById('bedrooms').value;
  const resultsContainer = document.getElementById('results');
  resultsContainer.innerHTML = ''; // Clear previous results

  const data = await fetchData();
  const filteredData = data.filter(property => property.zipcode === zipCode && property.bedrooms === bedrooms);

  filteredData.forEach(property => {
    const result = document.createElement('div');
    result.classList.add('result');
    result.textContent = `${property.address}, ${property.city}`;
    result.addEventListener('click', () => displayDetails(property));
    result.addEventListener('mouseover', () => highlightResult(result));
    result.addEventListener('mouseout', () => removeHighlight(result));
    resultsContainer.appendChild(result);
  });
}
```

Our front-end is crafted using HTML, and JavaScript. The snippets above and to the left showcase the design and functionality that enhance user interaction and exploration of housing market data.

Emphasizing user experience, we've incorporated intuitive elements such as dropdowns and filters. These features empower users to tailor their exploration, providing a customized view of the housing market.

# Visualizations & Demo

Explore our project through various lenses.

Zip Code: 78613 Number of Bedrooms: 3 Search

Property Recommendation in Texas USA. Group#9 Jorge,Omar,Chisom,Muhammad

1701 HONEYWEED ST, CEDAR PARK  
1700 HONEYWEED ST, CEDAR PARK  
2111 DAYFLOWER TRCE, CEDAR PARK  
2305 MACAW DR, CEDAR PARK  
2802 LITTLE ELM TRL, CEDAR PARK  
2110 W RIVIERA DR, CEDAR PARK  
1813 IRIS LN, CEDAR PARK  
621 BASIE BND, CEDAR PARK  
2906 WREN CIR, CEDAR PARK  
2412 TIVOLI DR, CEDAR PARK  
1108 RED BIRD DR, CEDAR PARK  
1106 RED BIRD DR, CEDAR PARK  
3307 BLAZING STAR TRL, CEDAR PARK  
1711 CHULA VISTA DR, CEDAR PARK  
1103 CHALLA DR, CEDAR PARK  
1101 RED BIRD DR, CEDAR PARK  
2803 CHIMNEY SWIFT TRL, CEDAR PARK  
804 WILLIAMS WAY, CEDAR PARK  
2210 MACAW DR, CEDAR PARK  
2405 BEELEIGH CT, CEDAR PARK  
2502 GRIST LN, CEDAR PARK  
2001 DAGAMA DR, CEDAR PARK  
2801 PRIMWOOD PATH, CEDAR PARK  
1513 SHADY CREEK TRL, CEDAR PARK  
2013 TATTERL DR, CEDAR PARK  
1809 CHULA VISTA DR, CEDAR PARK  
1808 LION HEART DR, CEDAR PARK  
3007 PEPPER GRASS TRL, CEDAR PARK  
2311 DARTFORD BND, CEDAR PARK  
1811 IRIS LN, CEDAR PARK  
2505 WANAKAH RIDGE DR, CEDAR PARK

**621 BASIE BND**

Zip Code: 78613  
Price: \$ 600764.0  
Bedrooms: 3  
Bathrooms: 2.0  
Last Sale Price: \$ 450000.0

Amount in \$USD

Bar Chart

Line Chart

Last Sold Price Current List Price

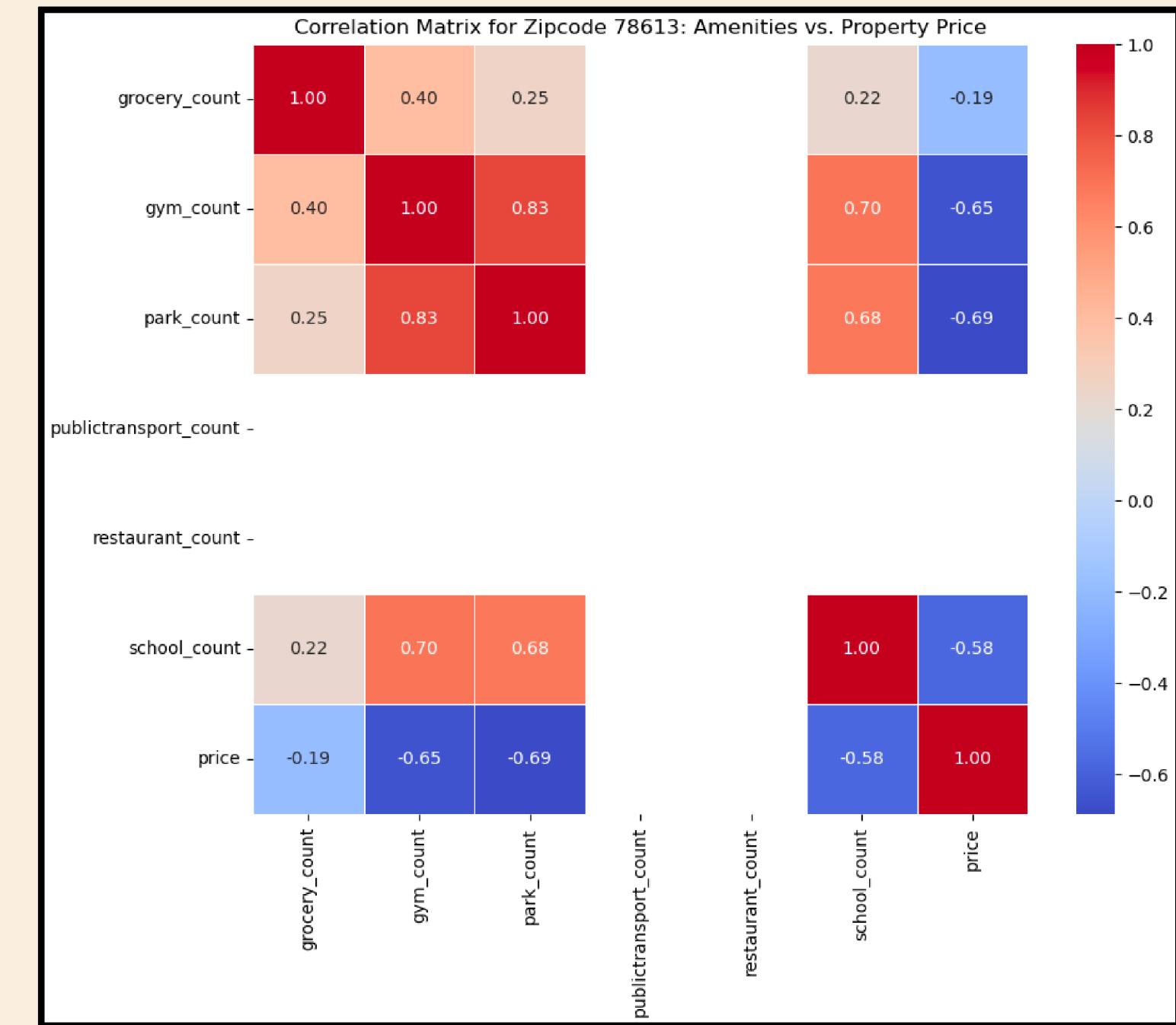
Amenities

Recommendations

# Recommendations

## Zip Code 78613 - Suburban Family Living

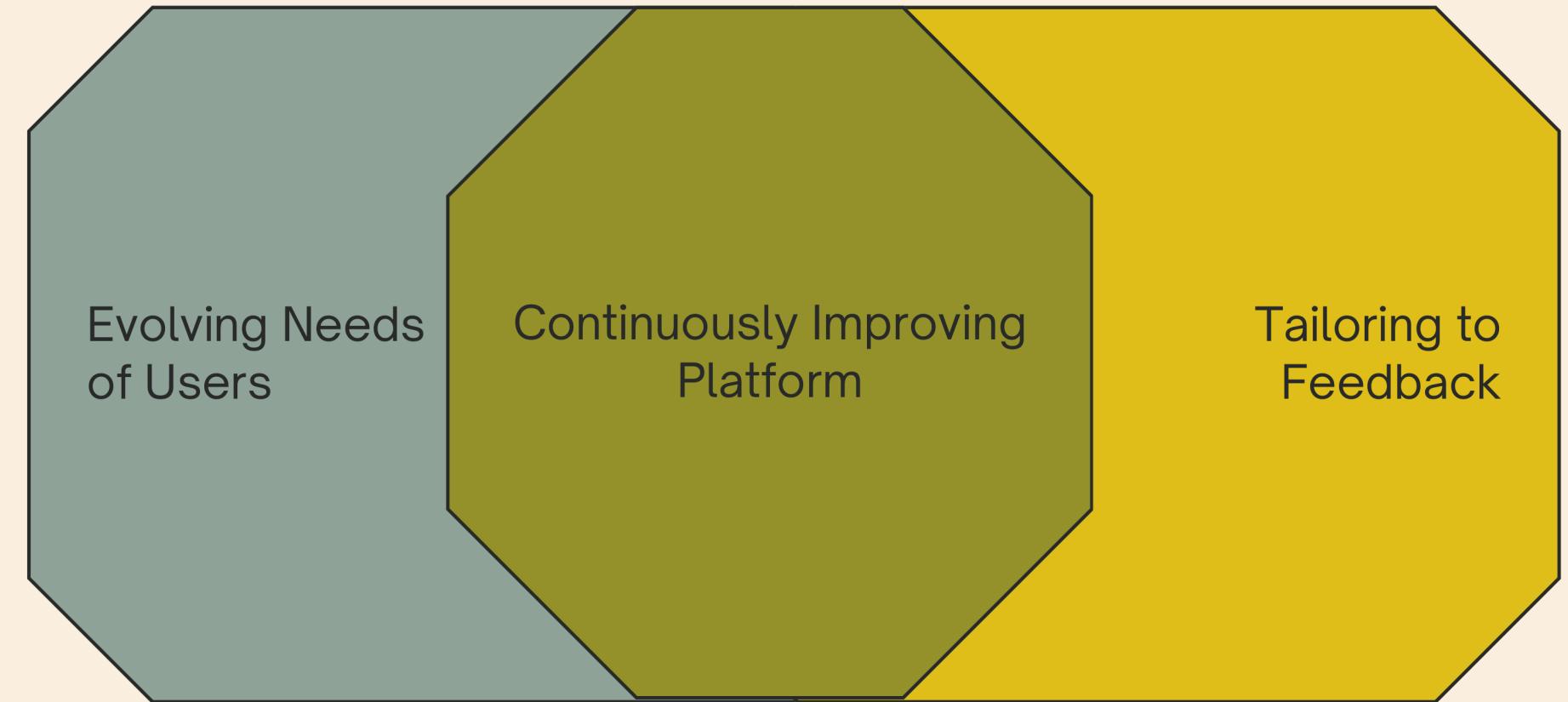
- Amenities: High correlation between the presence of schools, gyms, and parks.
- Reasoning: Indicates a family-oriented suburb where residents prioritize education, recreational spaces, and fitness facilities.



# Areas of Improvement

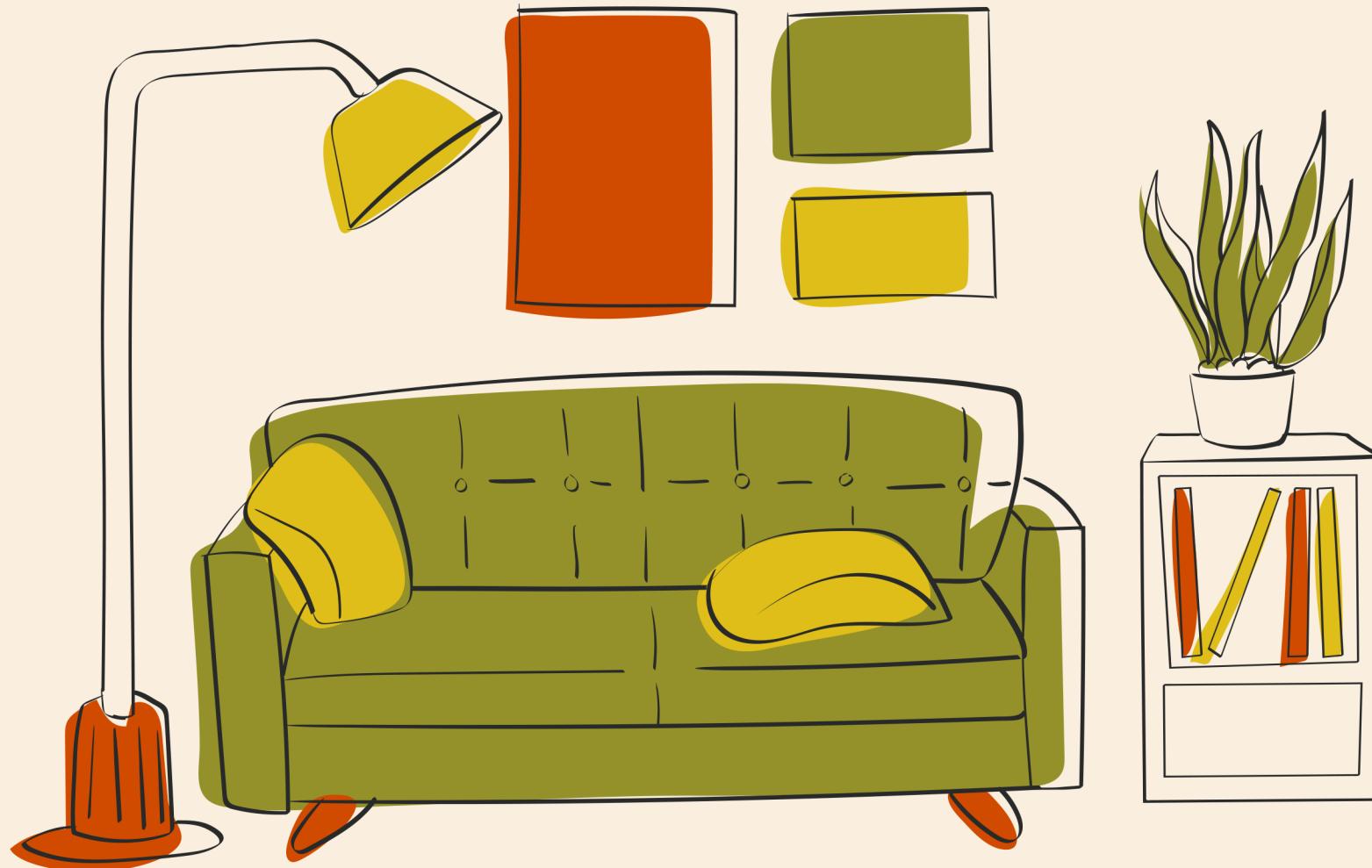
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Our roadmap includes exploring additional data sources, implementing more advanced visualizations, and introducing features that offer deeper insights into housing market trends.



# Q&A

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**THANK YOU!**



# References

[Flask Documentation](#)

[Leaflet Documentation](#)

[Plotly Documentation](#)

[Jupyter Notebooks Documentation](#)

[QuickDBD for Schema Design](#)

[Yelp API](#)

[ATTOM Real Estate API](#)

[10 U.S. cities that are growing the fastest](#)

