

# **HOUSTON ZIPS**

**HOUSTON REGION COMMERCIAL LEASING &  
DEVELOPMENT ZIP CODE ANALYSIS**

# INTRODUCTION

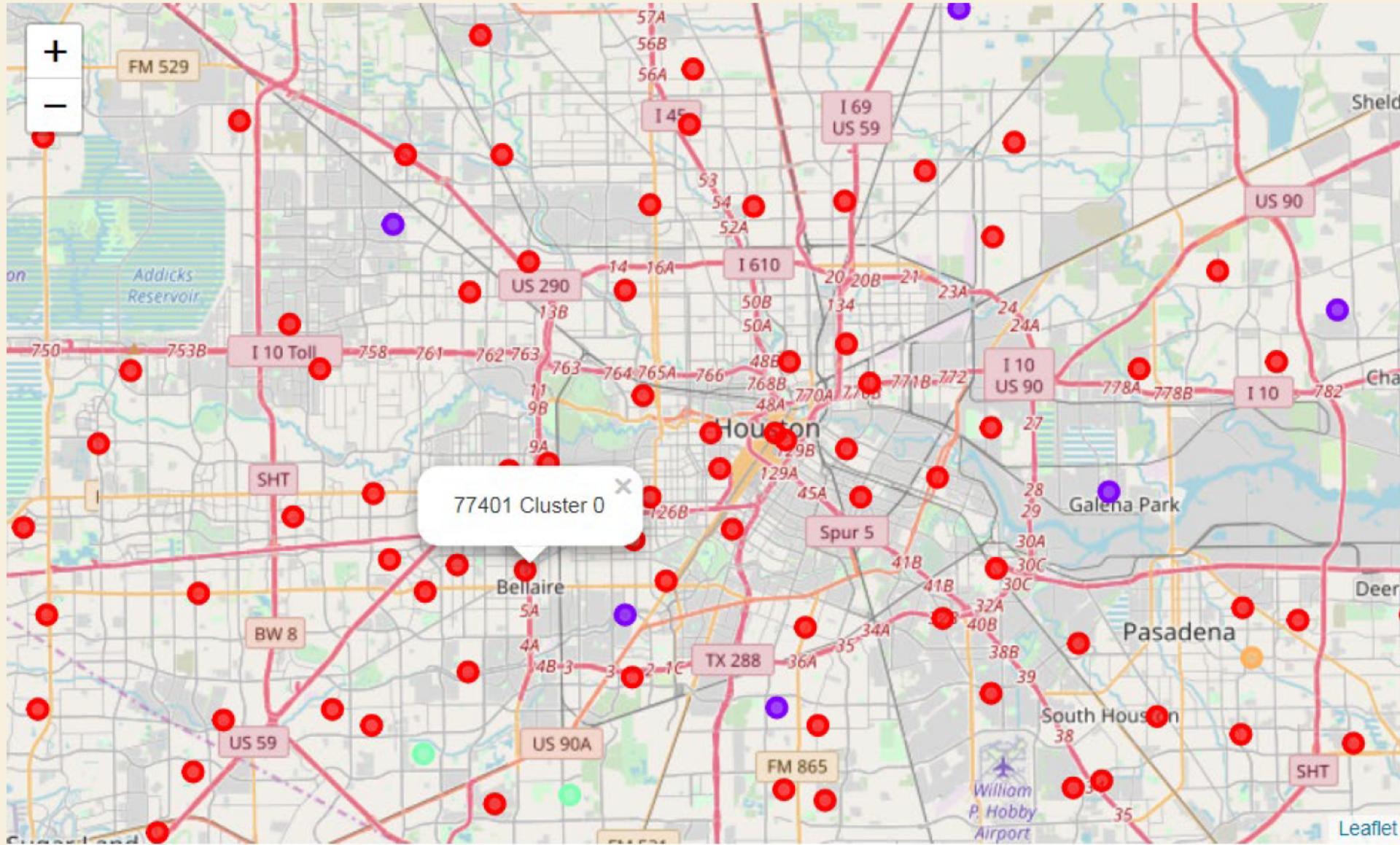
- A Jupyter notebook providing Houston region zip code analysis to help commercial real estate agents & developers make decisions for business center projects.
- Using Foursquare's crowd-sourced existing venue data grouped by Houston super-neighborhood locations, clustering neighborhoods into quintiles will help provide data-driven guidance for:
  - customer base (who is already shopping in the neighborhoods)
  - business-types (what businesses are in demand in the neighborhoods)
  - locations (where are neighborhoods for associated-type businesses)
- Plus valuable summary data for the area zip codes helps further explain focused areas within a clusters.

# DATA



- <https://mycity.maps.arcgis.com/home/index.html>
- Houston-region data is available from the City of Houston's Zip Code map json data. The map data includes latitude-longitude perimeter information for all 88 neighborhoods around the city, but zip code GIS point data will be pulled from the "geocoder" ArcGIS module.
- Foursquare's API provides crowd-sourced existing business data that can be pulled relative to a given geo-location, radius, and then "exploring" the top 100 venues in that radius. The Foursquare data has businesses segmented among 332 categories such as "coffee shop" and "farm".

# METHODOLOGY



# METHODOLOGY (CONTINUED)

	<b>Zipcode</b>	<b>1st Most Common Venue</b>	<b>2nd Most Common Venue</b>	<b>3rd Most Common Venue</b>	<b>4th Most Common Venue</b>	<b>5th Most Common Venue</b>	<b>6th Most Common Venue</b>	<b>7th Most Common Venue</b>	<b>8th Most Common Venue</b>	<b>9th Most Common Venue</b>
0	77002	Hotel	Coffee Shop	Burger Joint	Sandwich Place	Bar	Steakhouse	Southern / Soul Food Restaurant	Deli / Bodega	Gastropub
1	77003	Bar	Gas Station	Beer Garden	BBQ Joint	Fast Food Restaurant	Coffee Shop	Discount Store	American Restaurant	Gastropub
2	77004	Southern / Soul Food Restaurant	Mexican Restaurant	Food Truck	Lounge	Sushi Restaurant	Gift Shop	Gastropub	Caribbean Restaurant	Museum
3	77005	Mexican Restaurant	Spa	Gym / Fitness Center	Yoga Studio	Southern / Soul Food Restaurant	Smoothie Shop	Shipping Store	Sandwich Place	Restaurant
4	77006	Gay Bar	Italian Restaurant	Bar	Mexican Restaurant	Japanese Restaurant	Coffee Shop	Nightclub	Mediterranean Restaurant	Pizza Place



# RESULTS

- The results of the Houston zip code analysis show a wide variety of venue categories since the zip codes range from downtown urban areas, coastal beach areas, industrial / chemical plant areas, suburban areas, and rural areas.
- From the Foursquare API, explore mode, at a 500 meter radius:
- 1993 venues were pulled across the region
- Each zip code pulled between 1 and 89 venues (none maxed out at the 100 venue limit)
- 226 total categories were pulled across the region
- The cluster data shows a majority of active venue zip codes all around the city, which makes sense for the 4<sup>th</sup> largest city in the US. Other clusters are focused on parks, trails, construction and landscaping, or Mexican restaurants.
- The zip code frequency and Top 10 listings are interesting to get more focused zip code data within the 5 clusters.

# DISCUSSION

- Based on the cluster breakdowns, there seems to be bias based on parks, trails, construction and landscaping, and Mexican restaurants. Regarding parks and trails, Houston is not known for having comparably large number of parks compared to other cities so the geo-code point location and limited 500m radius may have overly influenced these zip code clusters. Regarding Mexican restaurants, Houston has a majority Hispanic population and a very large restaurant base, so I think this should not steer a small cluster as much as it is here.
- I think the bias for the 4 smaller clusters is resulting primarily from a limited area used to pull popular venues per zip code. Future analysis can include larger radii as able, since the Foursquare API used is limited transaction-wise. Additional analysis could be done for different zip codes that focus on proximity from the business downtown and shopping district downtown areas.

# CONCLUSION

- This notebook is currently a crude general level analysis of zip codes that can be used to analyze zip codes vs commercial development and leasing activity. Further work can be applied to try different factors and data sampling to provide a better general analysis tool. For a more focused project analysis tool, the framework is in place to run deep analysis to a smaller sample of comparable areas of interest.