Houston vs Dallas

Comparing a Cities and Neighborhoods is valuable for:

Tourists

- *A simple Google Search is not meaningful*

City Planners

- *Knowing how a city is unfolding allows for more intelligent future zoning*

New Residents

- *Will someone move to Houston or Dallas based on venues in the areas? Are there too many bars? Not enough convenience stores?*

New Business Owners

- *Should a franchise be built in one neighborhood or should it consider another location. Maybe even a different city!*

Data Acquisition and Cleaning

Houston's Neighborhood List - https://en.wikipedia.org/wiki/List_of_Houston_neighborhoods

Dallas' Neighborhood List - https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Dallas
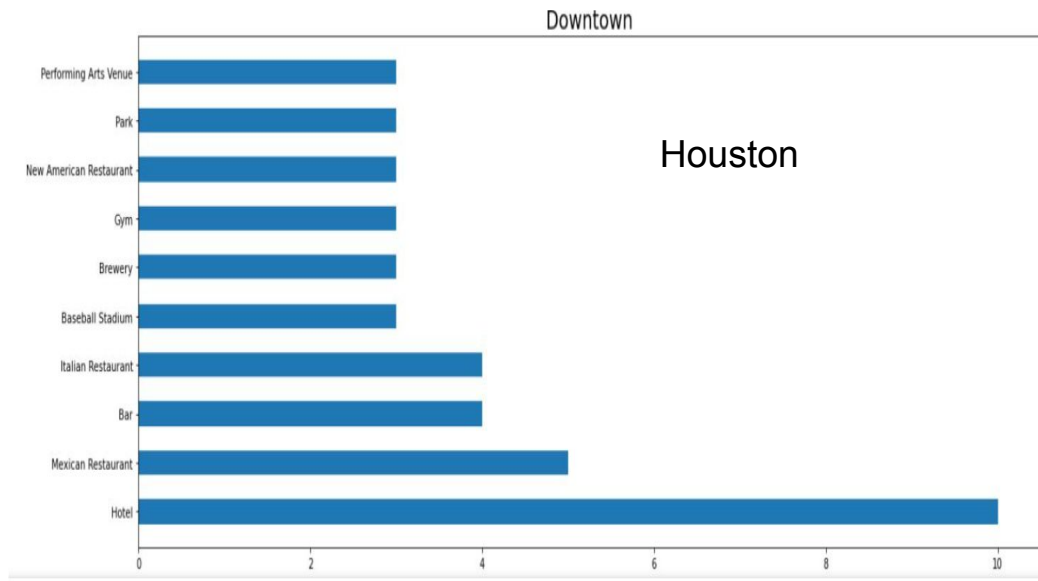
Datasets for both cities can be found on Kaggle that include all coordinate information:

https://www.kaggle.com/mrchristolpher/houston-texas-neighborhoods-lat-long-list

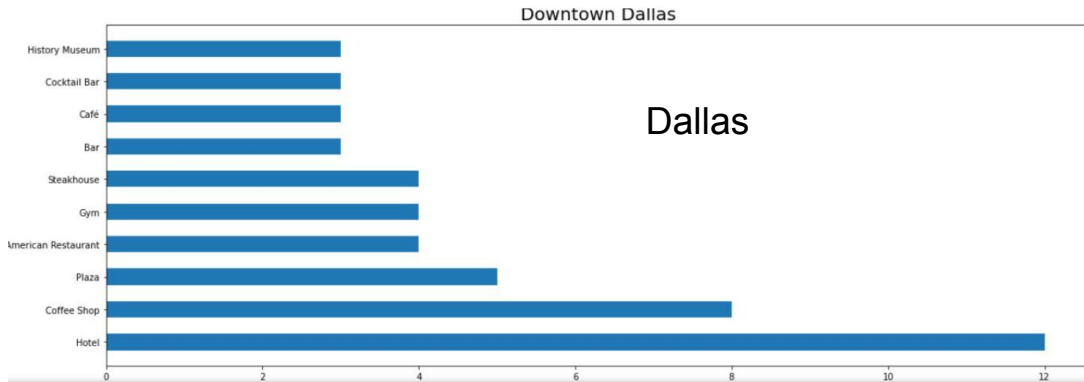https://www.kaggle.com/mrchristolpher/dallas-texas-neighborhoods-lat-long

Foursquare Location API was used to acquire:

- Houston contained **88** neighborhoods with **4153 total venues**. There were **318** unique venues

- Dallas contained **118** neighborhoods with **3020 total venues**. There were **264** unique venues

Downtown

Houston

(Bar chart showing venue counts for Houston Downtown, from top to bottom: Performing Arts Venue ~3, Park ~3, New American Restaurant ~3, Gym ~3, Brewery ~3, Baseball Stadium ~3, Italian Restaurant ~4, Bar ~4, Mexican Restaurant ~5, Hotel ~10)

Downtown Dallas

Dallas

(Bar chart showing venue counts for Downtown Dallas, from top to bottom: History Museum ~2.5, Cocktail Bar ~2.5, Café ~2.5, Bar ~2.5, Steakhouse ~4, Gym ~4, American Restaurant ~4, Plaza ~5, Coffee Shop ~8, Hotel ~12)

We can see that both Houston and Dallas' 'Downtowns' top venue was a hotel and then matched with similar restaurants.

Main difference seems to be that Dallas has more Coffee based venues while it was missing "Mexican Restaurant" even though this was Houston's number 2 venue!

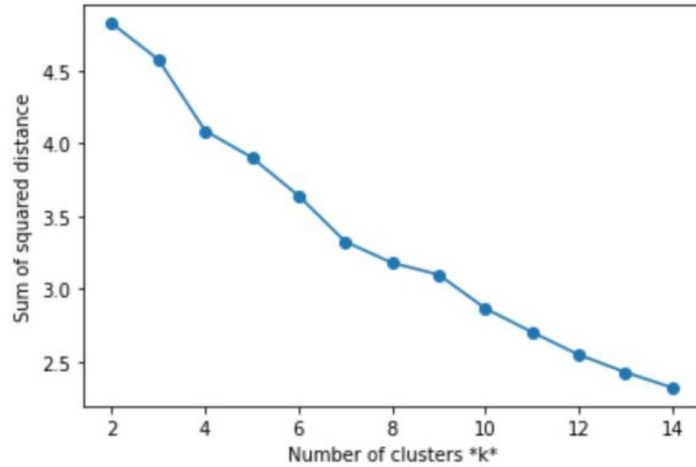|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Acres Home	Chinese Restaurant	Construction & Landscaping	Business Service	Bus Station	Discount Store	Farmers Market	Empanada Restaurant	Event Service	Exhibit	Eye Doctor
1	Addicks	Outdoors & Recreation	BBQ Joint	Government Building	Park	Dog Run	Eastern European Restaurant	Electronics Store	Empanada Restaurant	Event Service	Exhibit
2	Afton Oaks	Clothing Store	Furniture / Home Store	Women's Store	Department Store	American Restaurant	French Restaurant	Steakhouse	Shopping Mall	Hotel	Coffee Shop
3	Alief	Fast Food Restaurant	Pizza Place	Donut Shop	Grocery Store	Video Store	Discount Store	Furniture / Home Store	Spa	Gas Station	Café
4	Astrodome Area	Mobile Phone Shop	Sandwich Place	Pizza Place	Grocery Store	Mexican Restaurant	BBQ Joint	Mediterranean Restaurant	Bakery	Burger Joint	Restaurant
5	Braeburn	Cosmetics Shop	Discount Store	Chinese Restaurant	Bank	Sandwich Place	Clothing Store	Gas Station	Rental Car Location	Bar	Pharmacy
6	Braeswood	Gym	Park	Fried Chicken Joint	Burger Joint	Bakery	Playground	Liquor Store	Gas Station	Furniture / Home Store	Beer Store
7	Brays Oaks	Pizza Place	Fast Food Restaurant	Grocery Store	Discount Store	Video Store	Fried Chicken Joint	Park	Dry Cleaner	Bank	Sandwich Place
8	Briar Forest	Sandwich Place	Grocery Store	Mexican Restaurant	Fast Food Restaurant	Middle Eastern Restaurant	Mediterranean Restaurant	Pizza Place	Bank	Thai Restaurant	Asian Restaurant
9	Carverdale	Hotel	Gas Station	BBQ Joint	Burger Joint	Auto Garage	Breakfast Spot	Business Service	Taco Place	Go Kart Track	Sandwich Place

Houston

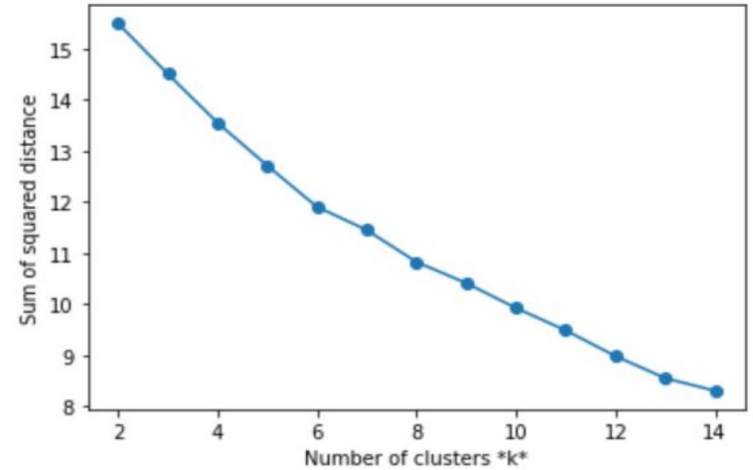|	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	Bachman-Northwest Highway	Mexican Restaurant	Fast Food Restaurant	Convenience Store	Coffee Shop	Gym	Shoe Store	Beer Bar	Furniture / Home Store	Big Box Store	Frozen Yogurt Shop
1	Bent Tree North	American Restaurant	Chinese Restaurant	Pizza Place	Nail Salon	Fast Food Restaurant	Flower Shop	Thai Restaurant	Burger Joint	Grocery Store	Supplement Shop
2	Bent Tree West	Convenience Store	Salon / Barbershop	Thai Restaurant	Sushi Restaurant	Pizza Place	Gym / Fitness Center	Donut Shop	Sandwich Place	Spa	Food Truck
3	Bertrand	Fried Chicken Joint	Discount Store	Burger Joint	Fast Food Restaurant	Light Rail Station	Thrift / Vintage Store	Deli / Bodega	Escape Room	Football Stadium	Food Truck
4	Beverly Hills	American Restaurant	Bakery	Shoe Store	Juice Bar	Seafood Restaurant	Cupcake Shop	Department Store	Sandwich Place	Coffee Shop	Shopping Mall
5	Botello	Zoo Exhibit	Mexican Restaurant	Fast Food Restaurant	Bus Station	Historic Site	Light Rail Station	Gas Station	Home Service	Fried Chicken Joint	Taco Place
6	Briarwood	Convenience Store	Restaurant	Construction & Landscaping	Dive Bar	American Restaurant	Dance Studio	Mexican Restaurant	Escape Room	Event Space	Fabric Shop
7	Brookhollow	Mexican Restaurant	Recreation Center	Automotive Shop	Golf Course	Gym / Fitness Center	Café	Video Store	Pet Store	Convenience Store	Flower Shop
8	Bryan Place	Beach Bar	Performing Arts Venue	Park	Coffee Shop	Fast Food Restaurant	Café	Furniture / Home Store	Boutique	Snack Place	Burger Joint
9	Buckner Terrace	Convenience Store	Fried Chicken Joint	Breakfast Spot	Fast Food Restaurant	Pizza Place	Discount Store	Motel	Café	Mexican Restaurant	Seafood Restaurant

Dallas

We can start to see from the exploratory analysis and one hot encoding:

- Certain neighborhoods are clearly more residential and other commercial

- Some neighborhoods do not have the same size (we can see go karts and golf course) just in the first 10 neighborhoods of our data frames.

- However, a lot of similarities. Mainly in the type of restaurants!

K-Means and Clustering

Houston shows an elbow at k=4

Dallas shows an elbow at k=6
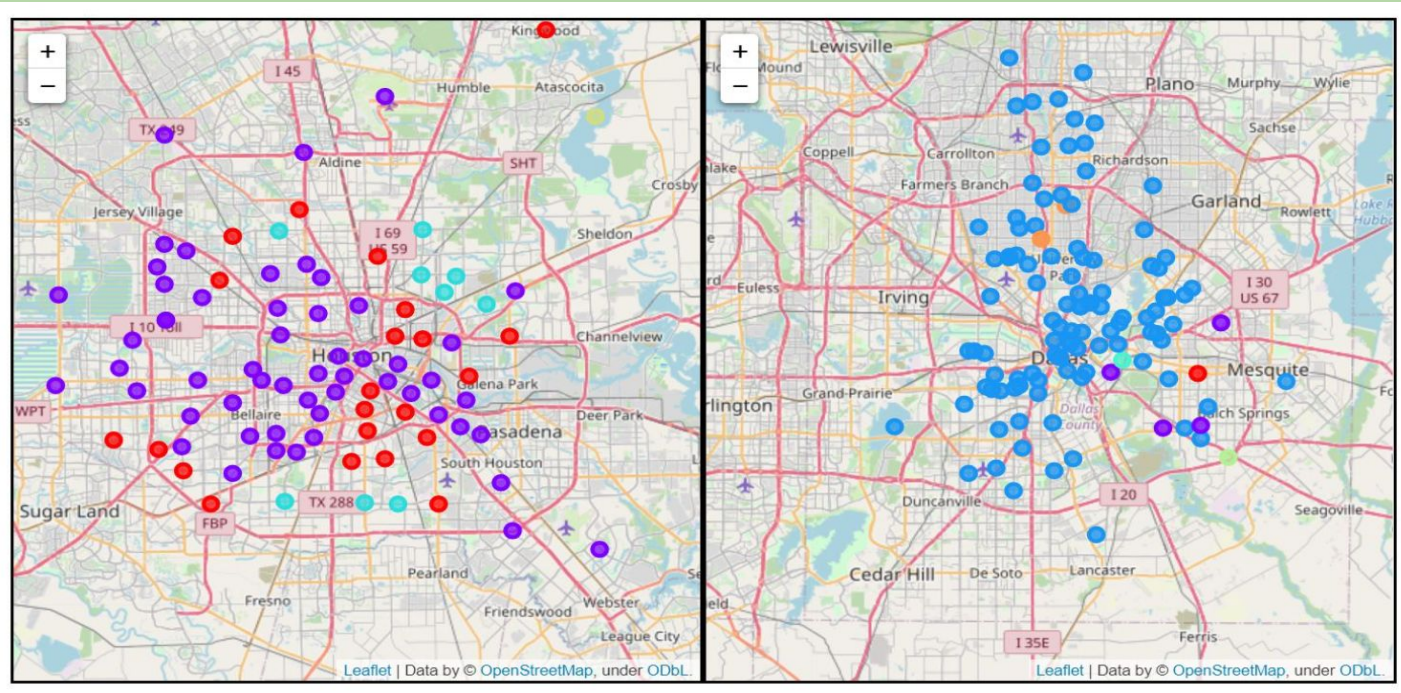
K-Means and Clustering

Houston	Dallas
Group 1 - 22	Group 1 - 1
Group 2 - 56	Group 2 - 4
Group 3 - 9	Group 3 - 108
Group 4 - 1	Group 4 - 1
N/A	Group 5 - 1
N/A	Group 6 - 3

Dallas had more clusters for categorizing the neighborhoods, however they seemed to all be clumped into one group.

Houston seems to be more evenly spread out!

Houston

Dallas

A map comparison it really brings the difference to light.

Conclusion and Future Directions

Houston seems to have more diverse neighborhoods than Dallas even though they have similar venues

Main Improvement Idea:

Add variable categories instead of just venues.
➔ Population
➔ Cost of Living
➔ Crime Rate