



Two cities comparison: Houston and Chicago

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Background and Problem

My husband and I lived in Houston for almost 7 years. My husband has recently got a job offer in Chicago, and we plan to move to Chicago by the end of September.

The goal is to perform a comparison of the two cities to see how similar or dissimilar they are.



Business interest

- Job seekers like us
- Company that would like to expand their business
- Any people who live in these two cities
- Extensible to other cities comparison

Data preparation

- City neighborhoods data from Wikipedia
- Weather and climate data from <https://www.timeanddate.com/weather/usa/>
- City crime data is from <https://www.neighborhoodscout.com/il/>
- Foursquare location data

Methodology

- **Web scraping**

- **Beautifulsoup**

```
url_houston = "https://en.wikipedia.org/wiki/List_of_neighborhoods_in_Houston"  
req_houston = requests.get(url_houston)
```

```
soup_houston = BeautifulSoup(req_houston.content)
```

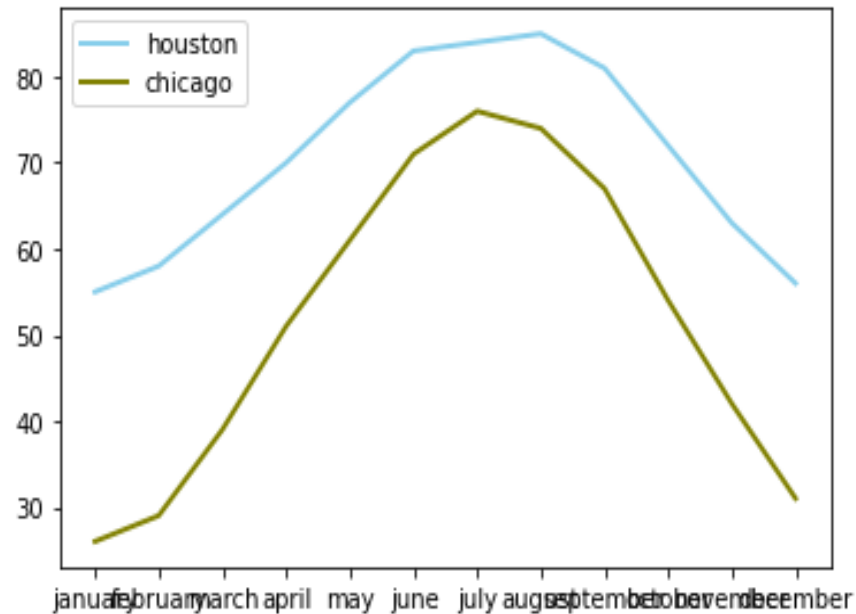
- **Foursquare API**

- Foursquare is a social location service that allows users to explore the world around them.

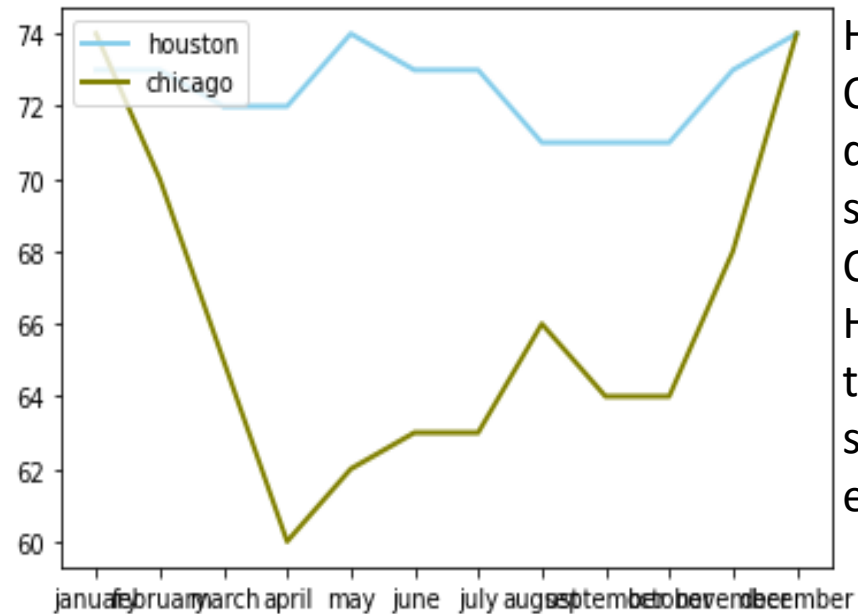
- **K-means**

- k-means clustering is a method of vector quantization, originally from signal processing, that aims to partition n observations into k clusters in which each observation belongs to the cluster with the nearest mean (cluster centers or cluster centroid), serving as a prototype of the cluster.

Results and Discussion



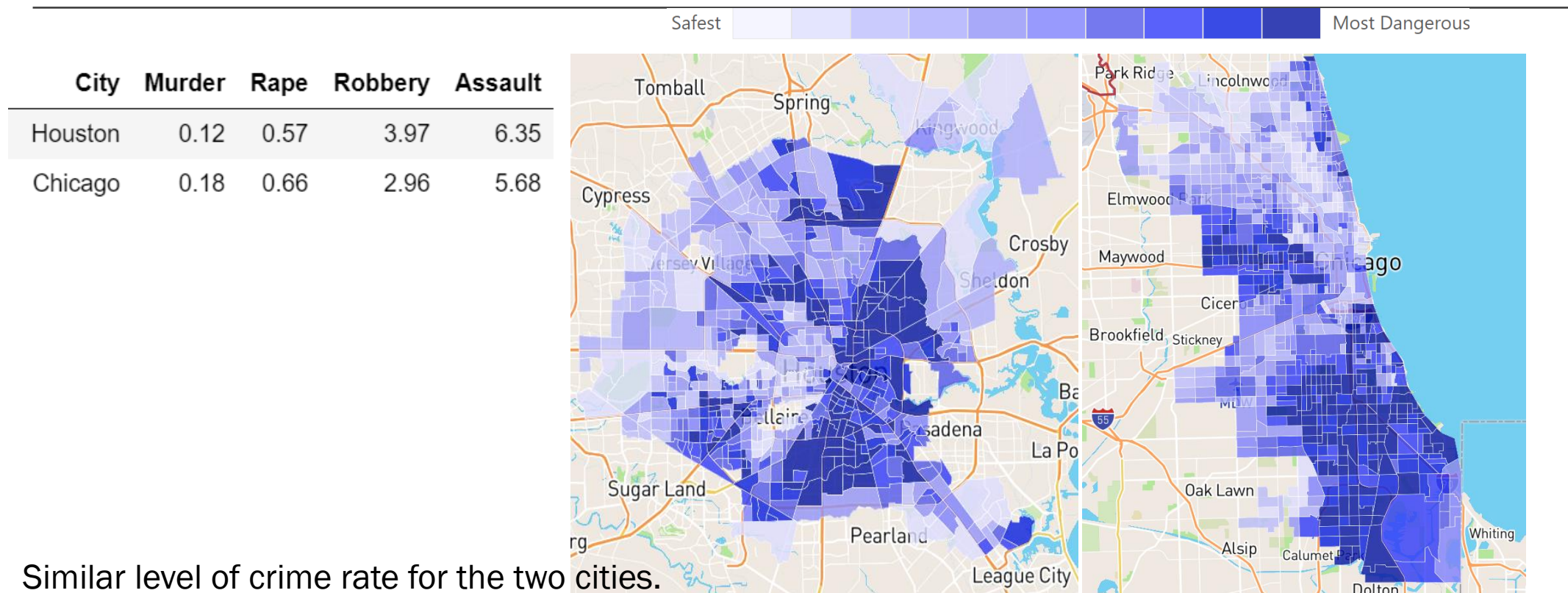
Temperature



Humidity

Houston is overall warmer than Chicago, the temperature difference in Houston among 4 seasons is much smaller than Chicago. Houston is very humid through the whole year, while Chicago shows a much lower humidity, especially in Summer.

Crime rate



Neighborhood data

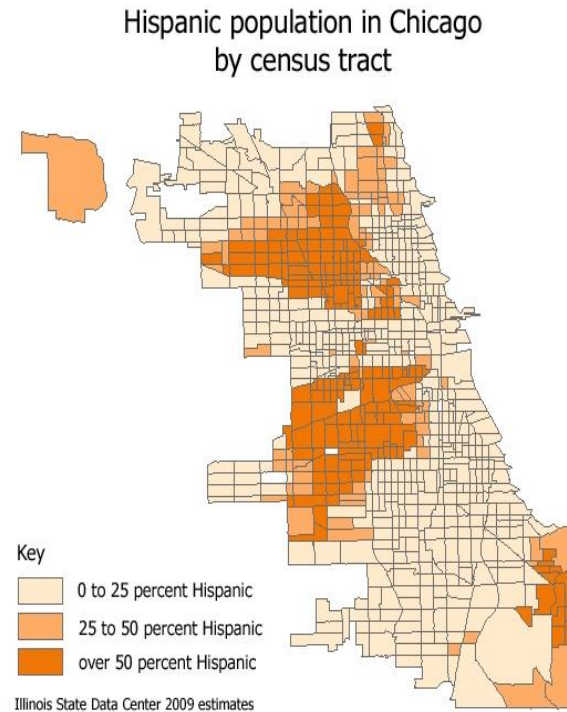
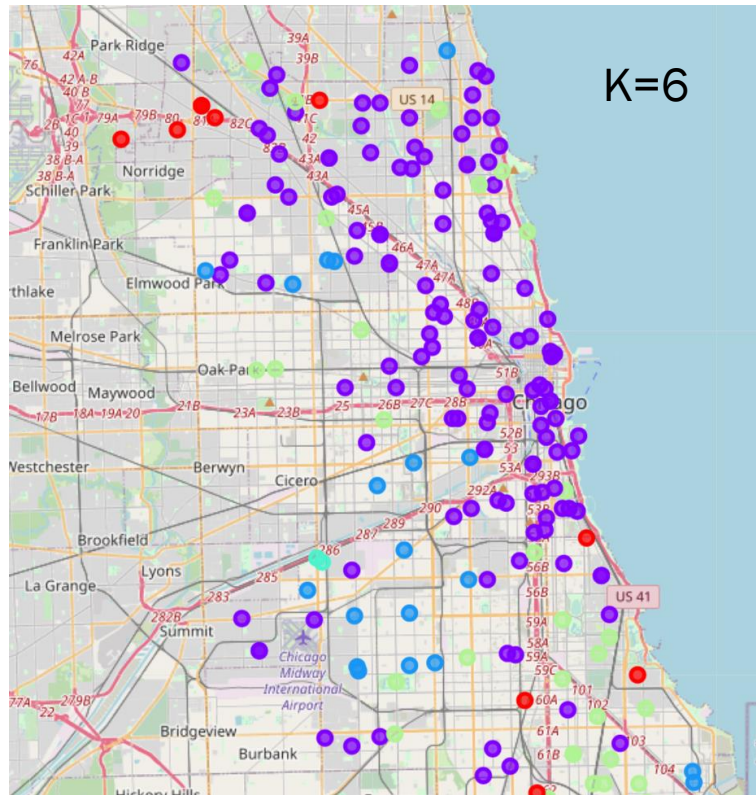
	Neighborhoods	Latitude	Longitude		Neighborhoods	Latitude	Longitude
0	Willowbrook, Houston, TX	29.660254	-95.456096	0	Albany Park, Chicago, IL	41.970329	-87.715992
1	Greater Greenspoint, Houston, TX	29.944719	-95.416074	1	Altgeld Gardens, Chicago, IL	41.655259	-87.609584
2	Carverdale, Houston, TX	29.848687	-95.539450	2	Andersonville, Chicago, IL	41.977139	-87.669273
3	Fairbanks / Northwest Crossing, Houston, TX	29.852726	-95.524386	3	Archer Heights, Chicago, IL	41.811422	-87.726165
4	Acres Home, Houston, TX	29.854948	-95.446884	4	Armour Square, Chicago, IL	41.840231	-87.632986
5	Hidden Valley, Houston, TX	29.892914	-95.418131	5	Ashburn, Chicago, IL	41.747533	-87.711163
6	Westbranch, Houston, TX	29.839541	-95.551522	6	Auburn Gresham, Chicago, IL	41.743167	-87.653728
7	Addicks / Park Ten, Houston, TX	29.788404	-95.644854	7	Avalon Park, Chicago, IL	41.745035	-87.588658
8	Spring Branch West, Houston, TX	29.801410	-95.547879	8	Avondale, Chicago, IL	41.938921	-87.711168
9	Langwood, Houston, TX	29.826282	-95.482795	9	Avondale Gardens, Chicago, IL	41.938921	-87.711168

Neighborhood venues frequency data

	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, Houston, TX	Rental Service	Home Service	Garden Center	Electronics Store	Food	Flower Shop	Financial or Legal Service	Fast Food Restaurant	Farmers Market	Eye Doctor
1	Addicks / Park Ten, Houston, TX	Hotel	Indian Restaurant	Steakhouse	Coffee Shop	Sushi Restaurant	New American Restaurant	Motel	Residential Building (Apartment / Condo)	Motorcycle Shop	Shipping Store
2	Alief, Houston, TX	Pool	Football Stadium	Playground	Shoe Repair	Zoo Exhibit	Electronics Store	Flower Shop	Financial or Legal Service	Fast Food Restaurant	Farmers Market
3	Astrodome Area, Houston, TX	Bar	Football Stadium	BBQ Joint	General Entertainment	Sports Bar	Gift Shop	Speakeasy	Coffee Shop	Light Rail Station	Theme Park Ride / Attraction
4	Braeburn, Houston, TX	Bar	Pharmacy	Food Service	Tennis Court	Food	Food Truck	Bike Trail	Donut Shop	Dry Cleaner	Duty-free Shop
	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	Albany Park, Chicago, IL	Mexican Restaurant	Chinese Restaurant	Grocery Store	Mobile Phone Shop	Accessories Store	Bus Station	Sandwich Place	Train Station	Thrift / Vintage Store	Karaoke Bar
1	Altgeld Gardens, Chicago, IL	Grocery Store	Park	Zoo Exhibit	Eastern European Restaurant	Elementary School	English Restaurant	Escape Room	Ethiopian Restaurant	Event Space	Exhibit
2	Andersonville, Chicago, IL	Italian Restaurant	Coffee Shop	Lounge	Breakfast Spot	Pet Store	Bar	Pizza Place	Beer Bar	Flower Shop	Miscellaneous Shop
3	Archer Heights, Chicago, IL	Mexican Restaurant	Mobile Phone Shop	Grocery Store	Big Box Store	Gas Station	Bank	Bar	Gym / Fitness Center	Sandwich Place	Coffee Shop
4	Armour Square, Chicago, IL	Chinese Restaurant	Ice Cream Shop	Italian Restaurant	Gas Station	Sandwich Place	Asian Restaurant	Grocery Store	Cosmetics Shop	Hot Dog Joint	Currency Exchange

Neighborhood venues data

Kmeans analysis for Chicago



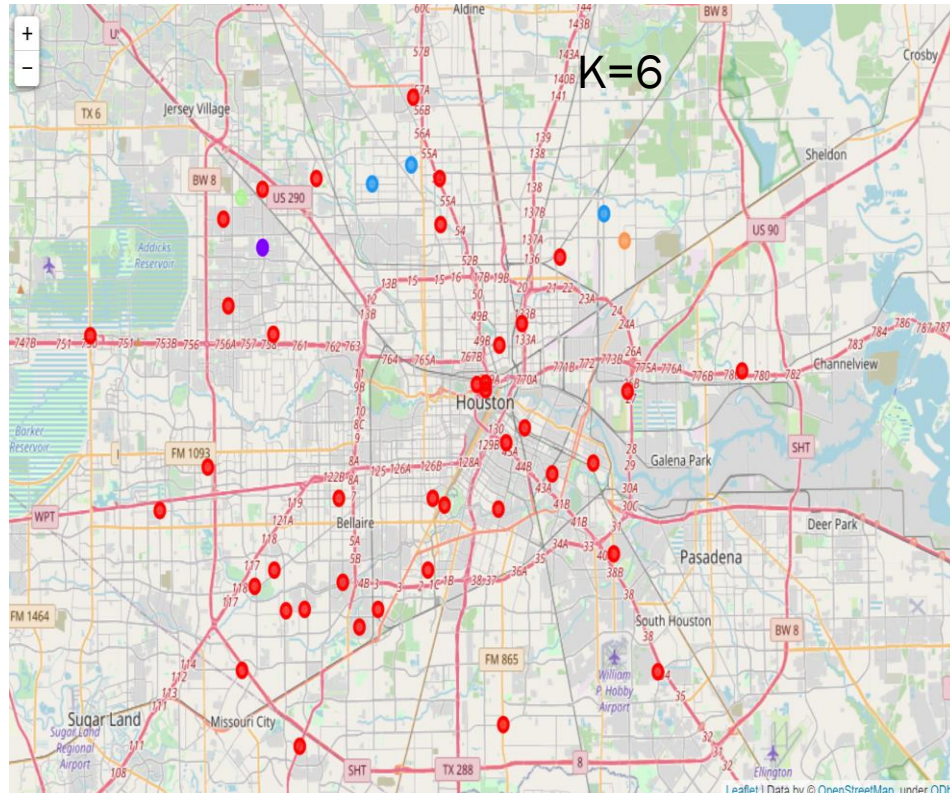
Purple dots common venues:
sandwich place, restaurants,
hotels and coffee shops.

Blue dots common venues:
Mexican restaurants (overlay
with Hispanic population density
map)

Red dots common venues: Park

Neighborhood venues data

Kmeans analysis for Houston



----Downtown, Houston, TX----

	venue	freq
0	Concert Hall	0.09
1	Park	0.09
2	Theater	0.09
3	Performing Arts Venue	0.06
4	Coffee Shop	0.06

Most of the neighborhood in Houston can be grouped together into one cluster. The most common venues were always stadiums, cafes, bars, hotels or restaurants.

Conclusion

- Chicago and Houston are similar modern, lively and diversified cities.
 - Chicago is more commercial than Houston
 - Chicago is more welcoming to tourists and young people
 - Chicago and Houston are similarly safe, never walk outside at night
 - Chicago winter or Houston summer, that is a question
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- Plan to collect more complicated information for the two cities and have a well round analysis
 - Looking forward to moving to Chicago