

A cluster of small squares in the top right corner, including solid teal, solid pink, and hollow orange squares.

AN ANALYSIS OF FOOD DESERTS AND ECONOMIC OPPORTUNITIES FOR A RETAIL OUTLET (GROCERY STORE) IN HOUSTON, TEXAS

A small cluster of squares in the bottom left corner, including a hollow orange square and a solid teal square.

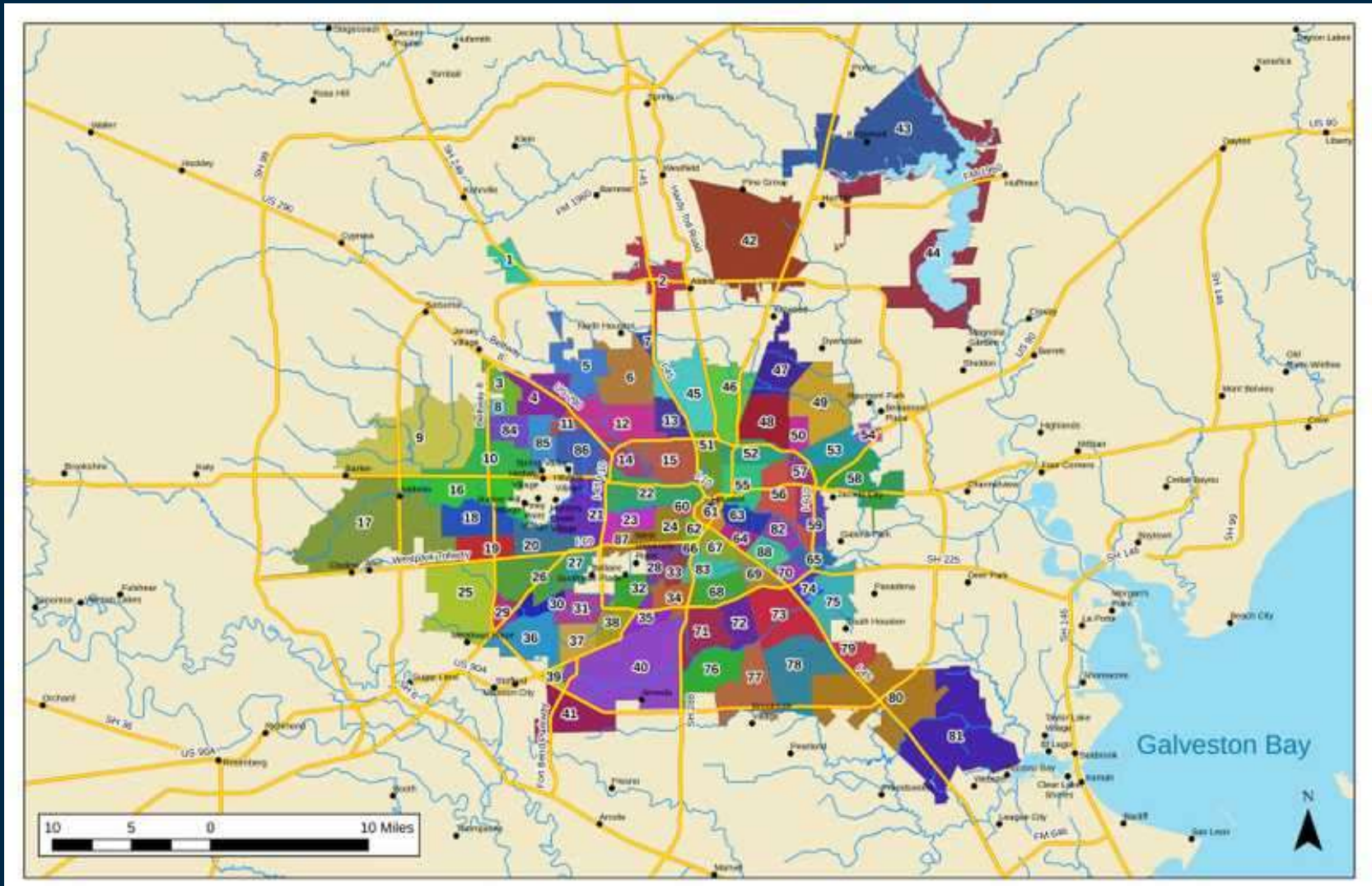
WHAT IS A SUPERNEIGHBOURHOOD?

A super neighbourhood is a geographically designated area where residents, civic organizations, institutions and businesses work together to identify, plan, and set priorities to address the needs and concerns of their community.

FOOD DESERTS IN HOUSTON

- Food deserts according to the CDC are “areas that lack access to affordable fruits, vegetables, whole grains, low-fat milk, and other foods that make up the full range of a healthy diet.” Individuals living in areas classified as food deserts are shown to have an increased risk of developing diabetes, cardiovascular disease, and being obese.
- About 23.5 million Americans and a reported 250,000 individuals living in Houston, TX lack easy access to grocery stores according to Rice University.
- While living in food deserts are shown to negatively impact one’s health, these areas would present lower competition for new grocery stores and allow for a perfect opportunity for business owners to open new grocery stores that not only help alleviate public health concerns, but to also serve the demand for fresh food for individuals that live in impacted areas leading to a greater possibility for a successful store.

THE 88 SUPERNEIGHBOURHOODS OF HOUSTON



BUSINESS PROBLEM

A Retail Store Chain wants to open up an outlet in Houston and wants to know which locations are food deserts in order to **select the best location for their new retail outlets that helps to solve the problems of food deserts and also a location that has the best probability of contributing immensely to the success of the business.**

DATA ACQUISITION

Data will be sourced from

- (http://www.houstontx.gov/planning/Demographics/demograph_docs/income_avgs.htm) which contains the list of neighbourhoods within Houston as well as their location relative to downtown, Texas totalling to 88 super neighbourhoods. BeautifulSoup library for Python will be used to extract the data.

- **Geocoding**

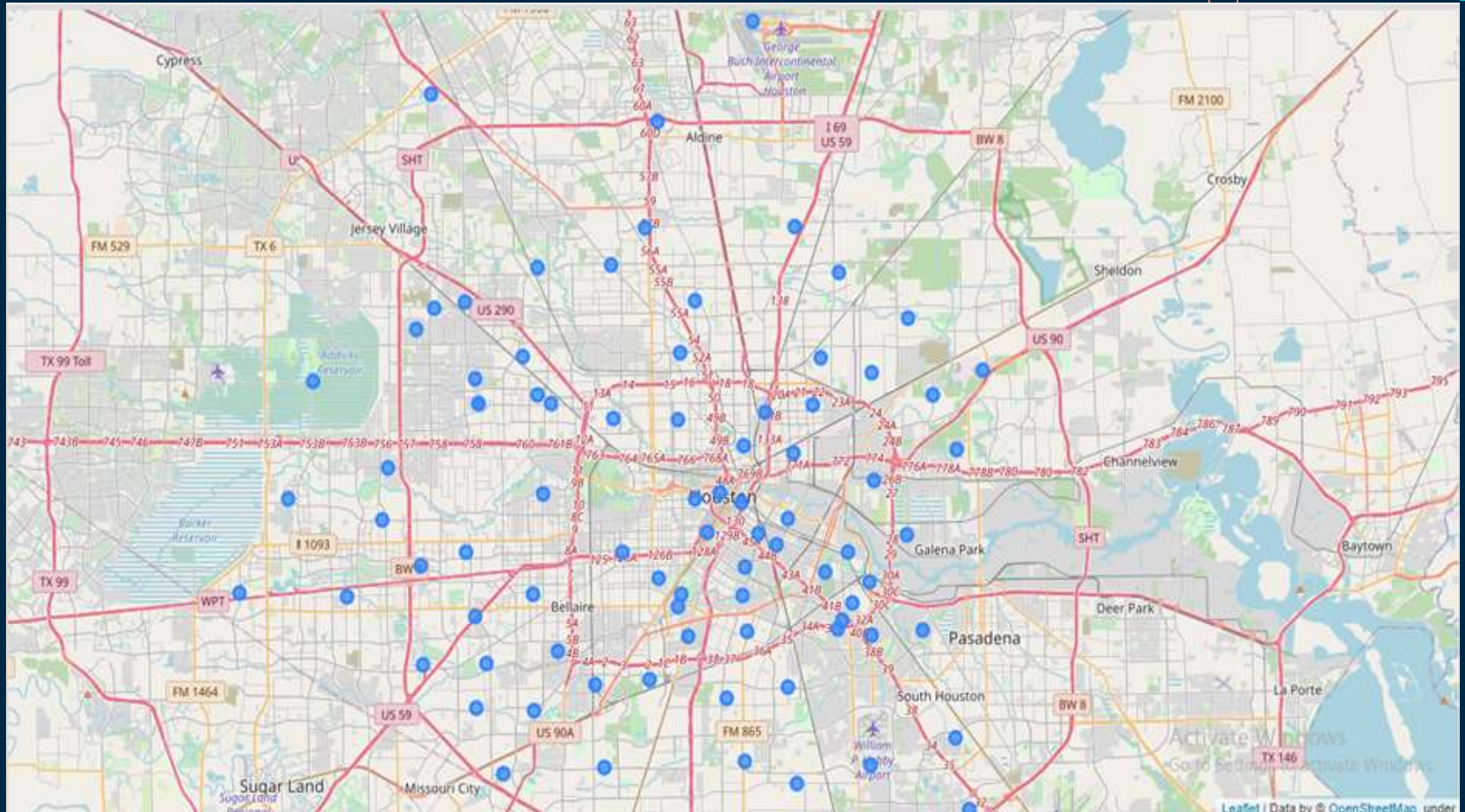
The File contents will be retrieved and fit into a Pandas data frame. The Longitude and Latitude of the neighbourhoods will be retrieved using a geocoder (geolocator) and the geometric locations received will be inserted into the initial data frame.

- **Foursquare API**

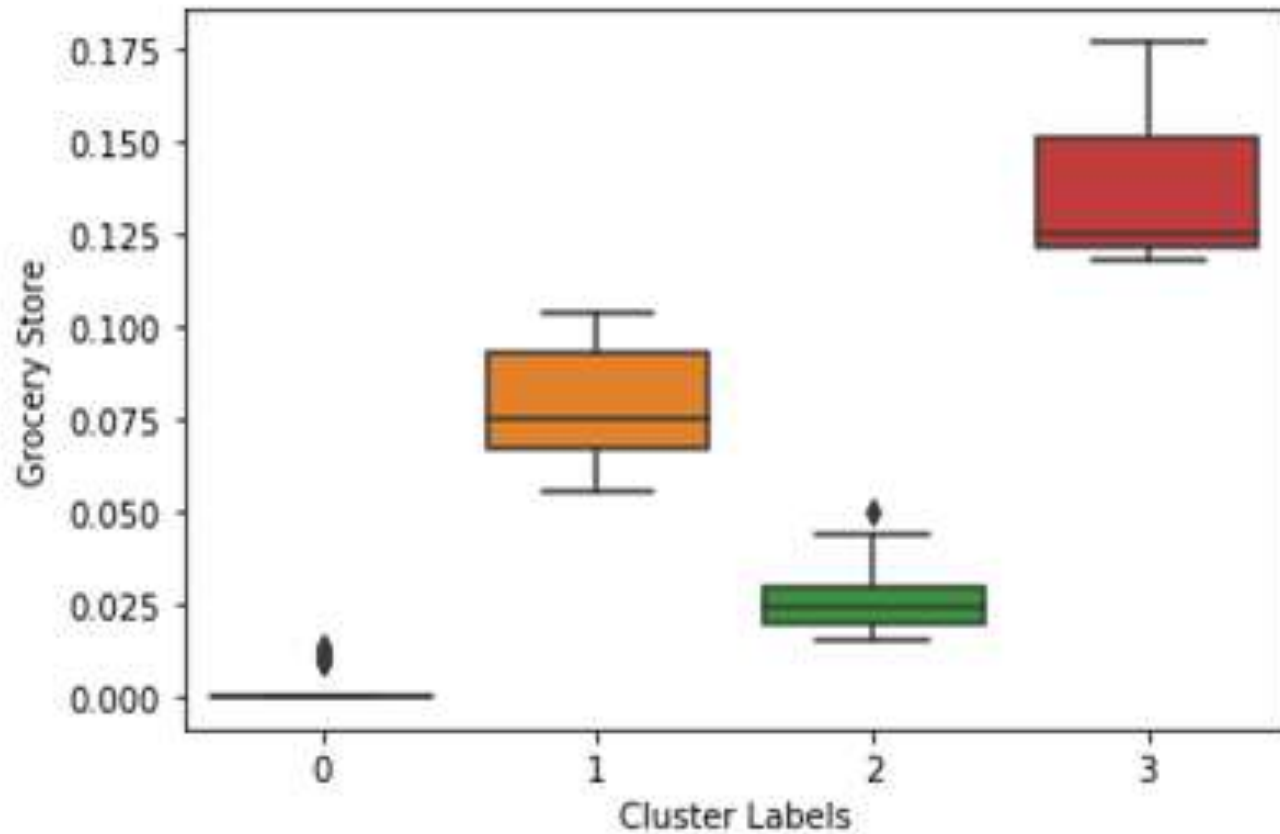
From the location data obtained after Web Scraping and Geocoding, the venue data is found out by passing in the required parameters to the Foursquare API, and creating another Data Frame to contain all the venue details along with the respective neighbourhoods.

HOW WE WILL ANALYSE THE DATA

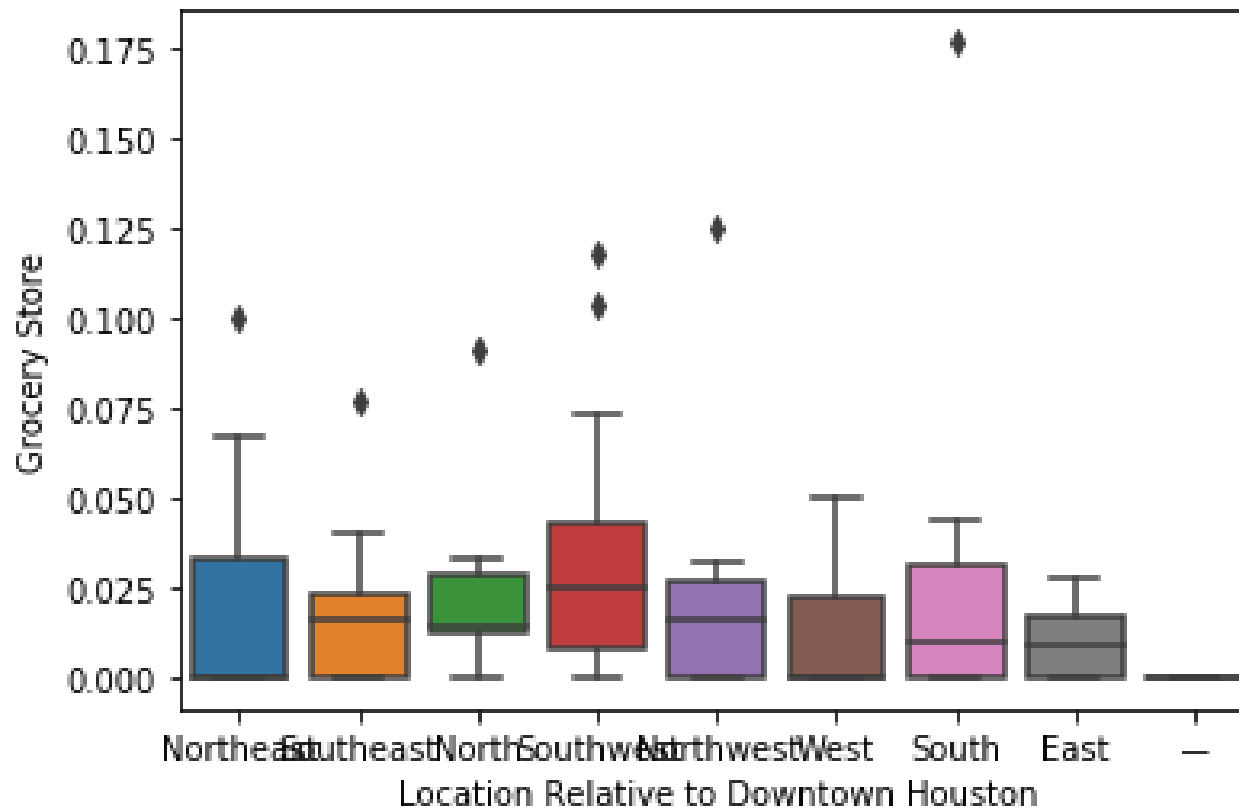
- Create a list of The 88 Super neighbourhoods of Houston and obtain geographic locations of each neighbourhood.
- Use Foursquare API to get information on the frequency of grocery stores in each neighbourhood.
- Combine the data from the previous steps together.
- The use of K-means to cluster the information from the merged data set.
- Examination of each cluster to find out the best area to open a retail outlet (grocery store).



A Clustered Map showing the frequencies of grocery stores in the 88 super neighbourhoods



Box Plot for Grocery Stores in Each Clustered Neighbourhood



Box Plot of Location Frequency for Grocery Stores

RESULTS OF ANALYSIS

Houston averages 0.024497 grocery stores overall within its 88 super neighbourhoods.

The super neighbourhoods were split into a total of 4 clusters:

- Cluster 0 : Neighbourhoods with moderate frequency of grocery stores
- *Cluster 1 : Neighbourhoods with high frequency of grocery stores*
- **Cluster 2 : Neighbourhoods with low frequency of grocery stores**
- *Cluster 3 (green): Neighbourhoods with very high frequency of grocery stores*

CONCLUSION AND RECOMENDATIONS

- In terms of the clustered data, cluster 2 has the lowest overall frequency of grocery stores by comparison to other groups
- In further looking at the frequency of grocery stores based on location relative to downtown Houston, areas located to the Northeast, and Southwest have the largest frequency of grocery stores. The lowest frequency of grocery stores relative to downtown Houston is central Houston showing 0 grocery stores in the area.
- **The best place to open a new grocery store would be in central Houston cluster 2.**

**THANK
YOU**

