



WHERE & WHAT INVESTMENT IN MOBILE COUNTY, ALABAMA WILL YIELD MAXIMUM RETURN ON INVESTMENT (ROI)?

AN APPLIED DATA SCIENCE CAPSTONE PROJECT USING K-MEANS CLUSTERING

IBM DATA SCIENCE PROFESSIONAL CERTIFICATION

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PROBLEM STATEMENT

- Mobile County, AL is growing at a rapid pace.
- Many investors from around the world would like to know which type of investment will be ideal in each neighborhood.



DATA SOURCES

- A base dataset with borough, neighborhood, postal code and geographical coordinates.
- Foursquare location data using API.

(446, 6)							
	Unnamed: 0	City	Postal Code	MLS Area	Latitude (generated)	Longitude (generated)	
0	NaN	ATMORE	36502.0	29 - NE Mobile City/Mt. Vernon	31.0238	-87.4939	
1	NaN	AXIS	36502.0	28 - Saraland/Satsuma/Axis/Creola	30.9299	-88.0272	
2	NaN	AXIS	36505.0	29 - NE Mobile City/Mt. Vernon	30.9299	-88.0272	
3	NaN	AXIS	36505.0	28 - Saraland/Satsuma/Axis/Creola	30.9299	-88.0272	
4	NaN	AXIS	36525.0	28 - Saraland/Satsuma/Axis/Creola	30.9299	-88.0272	

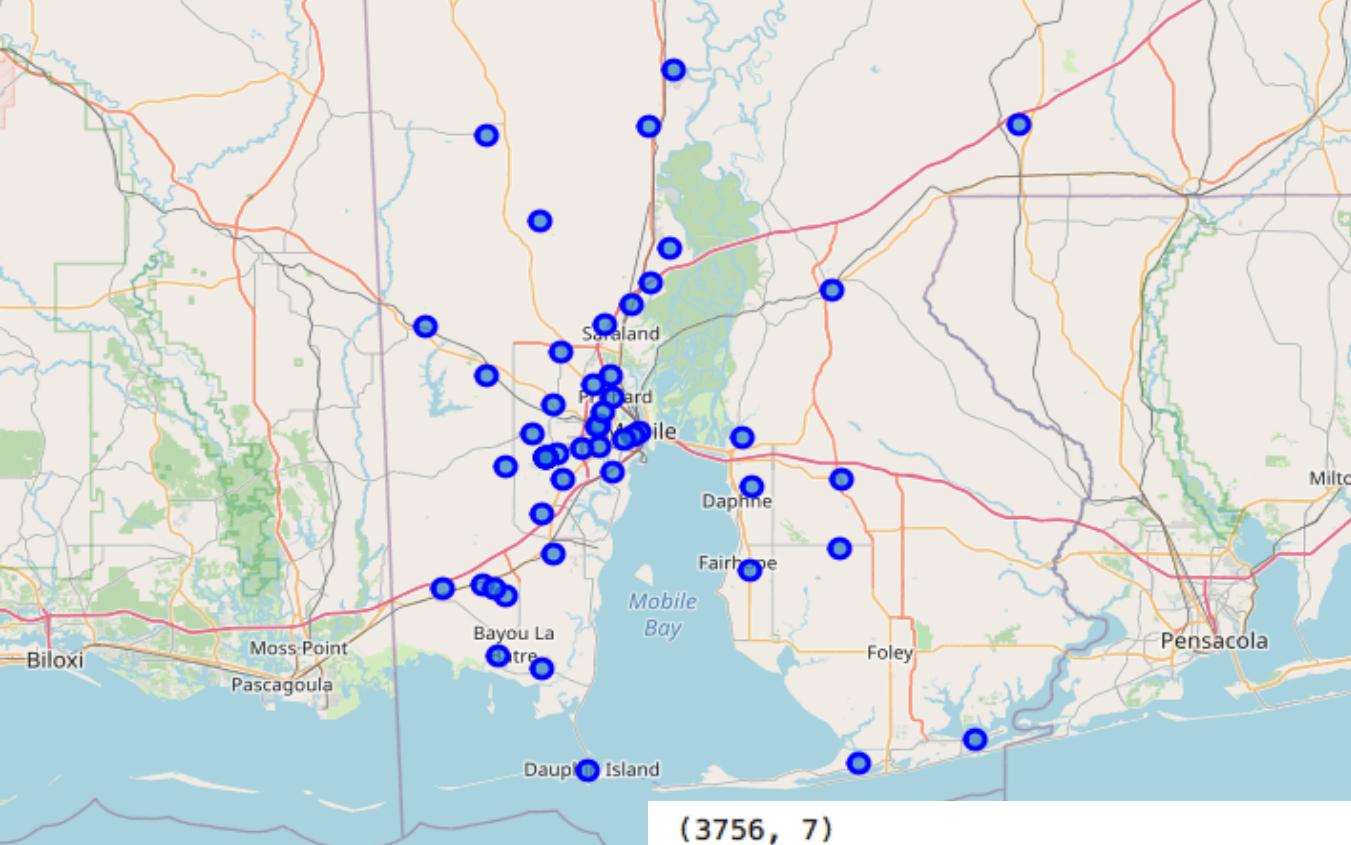
DATA PREPARATION

- Base dataset merged with another dataset to acquire latitude and longitude coordinates for postal codes

	Borough	PostalCode	Neighborhood	State	Latitude	Longitude
0	ATMORE	36502	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	AL	31.090528	-87.497150
1	AXIS	36505	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	AL	30.930065	-88.001030
2	BAY MINETTE	36507	NBald/SpFt/BayMin/Loxley	AL	30.875697	-87.765920
3	BAYOU LA BATRE	36509	S Mobile City/Theodore,Western Bay Shores,West...	AL	30.401384	-88.246710
4	MOBILE	36512	Eight Mile/Prichard	AL	30.658865	-88.177975

METHODOLOGY

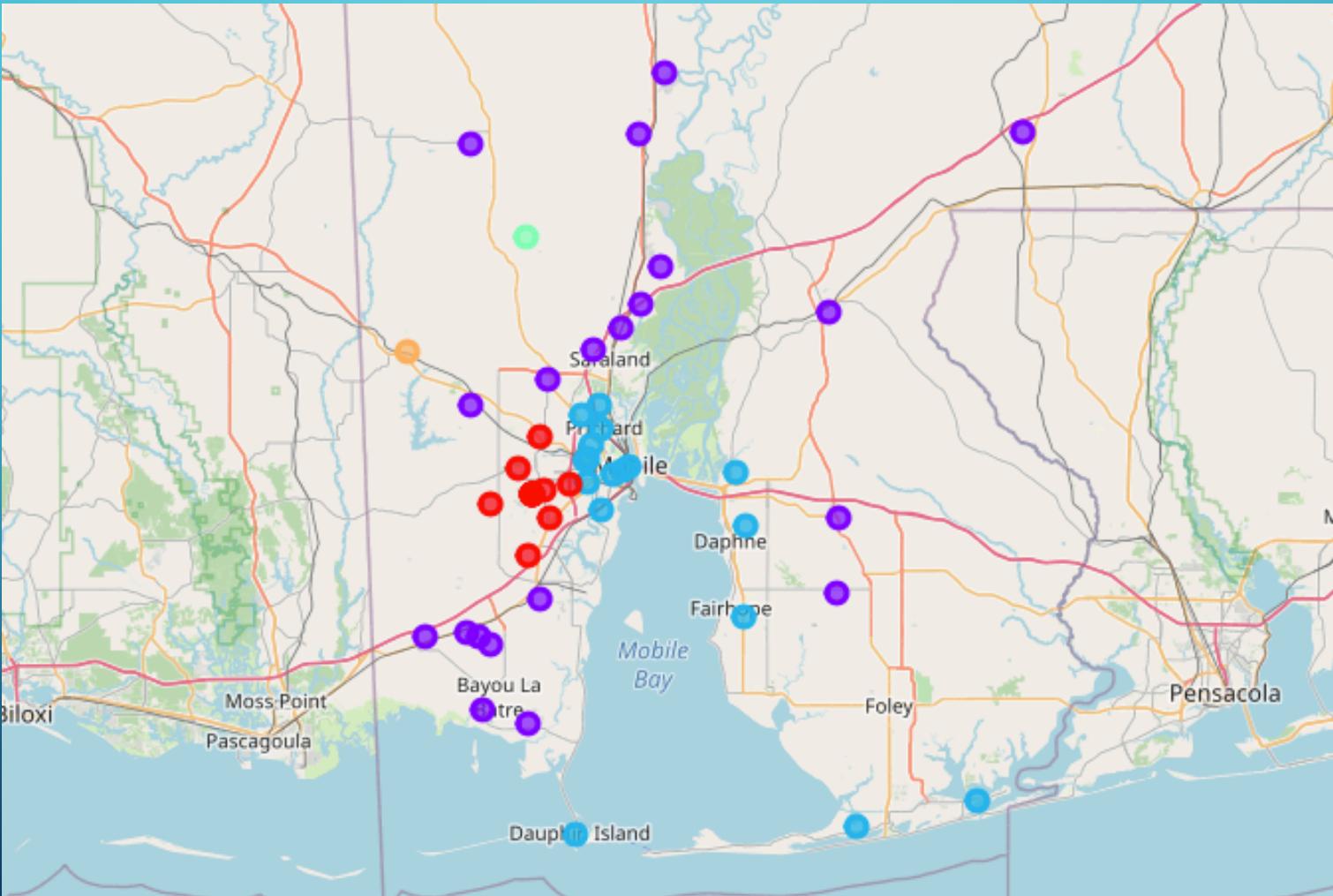
- Find venues using Foursquare API within 10000 meters of each neighborhood.
- Explore the venues.
- Create clusters using *k-means* algorithm.
- Explore clusters to infer insights.
- Determine number of locations per venue by grouping neighborhoods within each cluster.



VENUES USING FOURSQUARE API WITHIN 10000 METERS OF EACH NEIGHBORHOOD

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	31.090528	-87.49715	Poarch Creek Travel Plaza	31.086780	-87.538245	Convenience Store
1	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	31.090528	-87.49715	Waffle House	31.107221	-87.477340	Breakfast Spot
2	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	31.090528	-87.49715	Walmart	31.038058	-87.494428	Big Box Store
3	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	31.090528	-87.49715	the coffee house	31.025738	-87.494461	Café
4	NE Mobile City/Mt. Vernon,Saraland/Satsuma/Axi...	31.090528	-87.49715	Wind Creek Casino & Hotel Atmore	31.102860	-87.482801	Casino

CLUSTERS USING K-MEANS ALGORITHM



BREAKDOWN OF ‘BOROUGH’ MOBILE IN CLUSTER ZERO

MOBILE		
BBQ Joint	14.0	
Bar	7.0	
Burger Joint	7.0	
Café	7.0	
Coffee Shop	15.0	
Deli / Bodega	1.0	
Department Store	1.0	
Donut Shop	8.0	
Fried Chicken Joint	8.0	
Grocery Store	14.0	
Italian Restaurant	15.0	
Mexican Restaurant	15.0	
Sandwich Place	15.0	
Seafood Restaurant	15.0	
Southern / Soul Food Restaurant	8.0	

RECOMMENDATION

- Target 'Boroughs' in cluster 0 except Mobile.
- Mobile should be not discarded before gathering additional details:
 - Are people from neighboring 'Boroughs' coming to Mobile for leisure? or
 - Does Mobile have corporate offices of all the industries?
 - Does Mobile organize major events throughout the events?
 - Lastly, it is also important to consider other factors like population, real estate prices etc. along with specific city laws for each venue type.

Python

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