

Capstone Project-

The battle of
Neighborhood

Ronak Bhatt

Problem statement-

Charlotte is a one of the most populous city of USA. Between 2004 to 2014, charlotte was rank as fastest growing metro area with 880000 more resident. (Per Wikipedia). Opportunity of opening new business and being successful is real. Being there are many different kinds of business ideas, opening a restaurant is on top of the list for my customer. Before they think about other things require to open a restaurant, they would like to do assessment on different area based on area, nearby restaurant etc. This will help them compare and decide best location.

Description of Data-

Based on the problem that we are trying to solve, assessment on following list based on zip code would be important.

Zip code list of the charlotte

Near by Restaurant

We will use

1. <https://docs.gaslamp.media/download-zip-code-latitude-longitude-city-state-county-csv/> - To get list of zipcode in charlotte area
2. Number of restaurants and their type and location in every neighborhood will be obtained using Foursquare API

Methodology-

In this section we will be doing following steps

1. Data collection
2. Data preparation and preprocessing
3. Modeling

1. Data collection

- a. In this section import libraries
- b. Read CSV file- http://docs.gaslamp.media/wp-content/uploads/2013/08/zip_codes_states.csv

2. Data preparation and preprocessing

- a. Import data and from the csv file and review it.
- b. It is collection of all counties, cities and states data

zip_code	latitude	longitude	city	state	county	
0	501	40.922326	-72.637078	Holtsville	NY	Suffolk
1	544	40.922326	-72.637078	Holtsville	NY	Suffolk
2	601	18.165273	-66.722583	Adjuntas	PR	Adjuntas
3	602	18.393103	-67.180953	Aguada	PR	Aguada
4	603	18.455913	-67.145780	Aguadilla	PR	Aguadilla

c. Extract all rows containing city name Charlotte

	zip_code	latitude	longitude	city	state	county
0	5445	44.316580	-73.226034	Charlotte	VT	Chittenden
1	12036	42.541025	-74.655395	Charlotteville	NY	Schoharie
2	20622	38.484421	-76.754943	Charlotte Hall	MD	Saint Marys
3	22901	38.093604	-78.561139	Charlottesville	VA	Albemarle
4	22902	38.026588	-78.480450	Charlottesville	VA	Charlottesville City

d. Filter all rows for state NC

	zip_code	latitude	longitude	city	state	county
0	28201	35.260020	-80.804151	Charlotte	NC	Mecklenburg
1	28202	35.226192	-80.843493	Charlotte	NC	Mecklenburg
2	28203	35.208992	-80.856343	Charlotte	NC	Mecklenburg
3	28204	35.215342	-80.828706	Charlotte	NC	Mecklenburg
4	28205	35.325959	-80.827444	Charlotte	NC	Mecklenburg

e. As the table suggest, we have list of different zip codes with its location data. Use Foresquare API to collect nearby locations in different neighborhood in Charlotte within radios of 1000 meter. Groupby data with neighborhood.

(386, 7)

	Neighborhood	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	C	35.26002	-80.804151	Popeyes Louisiana Kitchen	35.256585	-80.797171	Fried Chicken Joint
1	C	35.26002	-80.804151	Budget Car Rental	35.266466	-80.807570	Rental Car Location
2	C	35.26002	-80.804151	7-Eleven	35.255222	-80.801427	Convenience Store
3	C	35.26002	-80.804151	United States Postal Service	35.253929	-80.801192	Post Office
4	C	35.26002	-80.804151	Compare Foods	35.257738	-80.793654	Grocery Store

f. After group by data with Neighborhood

	Neighborhood Latitude	Neighborhood Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
Neighborhood						
C	11	11	11	11	11	11
a	93	93	93	93	93	93
e	48	48	48	48	48	48
h	100	100	100	100	100	100
l	3	3	3	3	3	3
o	8	8	8	8	8	8
r	78	78	78	78	78	78
t	45	45	45	45	45	45

g. Apply one hot encoding on Charlotte grouped Data frame.

	Neighborhood	Yoga Studio	Adult Boutique	Airport	Airport Terminal	American Restaurant	Art Gallery	Art Museum	Arts & Crafts Store	Asian Restaurant	...	Taco Place	Tapas Restaurant	Thai Restaurant	Theater	Vegetarian / Vegan Restaurant	Vietnamese Restaurant	Warehouse Store	Wine Bar	Wine Shop	Women's Store
0	C	0.000000	0.0	0.0	0.0	0.000000	0.090909	0.00	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.00	0.000000	0.000000	0.0	0.000000	0.000000	0.000000
1	a	0.010753	0.0	0.0	0.0	0.032258	0.000000	0.00	0.000000	0.021505	...	0.010753	0.010753	0.021505	0.00	0.010753	0.000000	0.0	0.021505	0.010753	0.010753
2	e	0.041667	0.0	0.0	0.0	0.041667	0.000000	0.00	0.020833	0.000000	...	0.000000	0.000000	0.000000	0.00	0.000000	0.020833	0.0	0.000000	0.020833	0.000000
3	h	0.000000	0.0	0.0	0.0	0.030000	0.010000	0.01	0.000000	0.000000	...	0.000000	0.010000	0.010000	0.04	0.000000	0.000000	0.0	0.000000	0.010000	0.000000
4	l	0.000000	0.0	0.0	0.0	0.000000	0.000000	0.00	0.000000	0.000000	...	0.000000	0.000000	0.000000	0.00	0.000000	0.000000	0.0	0.000000	0.000000	0.000000

5 rows x 142 columns

3. Modeling

a. Apply K-means clustering.

b. Find top 10 most common venues in each neighborhood

	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	C	Health & Beauty Service	Seafood Restaurant	Post Office	Rental Car Location	Grocery Store	Art Gallery	Spanish Restaurant	Convenience Store	Bus Station	Fried Chicken Joint
1	a	Coffee Shop	Mexican Restaurant	Brewery	Furniture / Home Store	American Restaurant	Pizza Place	Restaurant	Gourmet Shop	Gym / Fitness Center	Ice Cream Shop
2	e	Yoga Studio	Mexican Restaurant	Food Truck	Burger Joint	Liquor Store	Bakery	Pub	Pizza Place	Deli / Bodega	American Restaurant
3	h	Hotel	Steakhouse	Restaurant	Theater	Pizza Place	Park	American Restaurant	Pub	Coffee Shop	Lounge
4	l	Discount Store	Gym / Fitness Center	Breakfast Spot	Women's Store	Fast Food Restaurant	Farmers Market	Dry Cleaner	Donut Shop	Doctor's Office	Diner
5	o	American Restaurant	Food Truck	Burger Joint	Fast Food Restaurant	Brewery	Grocery Store	Discount Store	Farmers Market	Dry Cleaner	Donut Shop
6	r	Pizza Place	Coffee Shop	Sandwich Place	Park	New American Restaurant	American Restaurant	Bar	Ice Cream Shop	Italian Restaurant	Chinese Restaurant
7	t	Italian Restaurant	American Restaurant	Spa	French Restaurant	Intersection	Coffee Shop	Gym / Fitness Center	Pharmacy	Salon / Barbershop	Mexican Restaurant

c. Map

