



IBM DATA SCIENCE PROFESSIONAL CERTIFICATE

APPLIED DATA SCIENCE CAPSTONE PROJECT

THE BATTLE OF THE NEIGHBORHOODS

15TH FEBRUARY 2021

THE STATE OF FLORIDA (KEY FACTS)

- Third Largest state in the (Population)
- Fourth largest state in the us (GDP)
- GDP of One Trillion in 2018 and (17th in the World)
- 134 Million Tourist Visits Annually
- 40 Billion in Tourist Spend Annually
- More People Move to Florida than Any Other State



BUSINESS PROBLEM

- How to identify a business category and determine the geographic location of a startup to generate profit and maximizes revenue



DATA SOURCES AND DESCRIPTION

www.simplemaps.com

- Latitude and longitude

<https://data.census.gov/cedsci/>

- Population
- Population Density
- Average household Income

www.foursquare.com

- Venues
- Venue Category
- Venue Latitude and Longitude



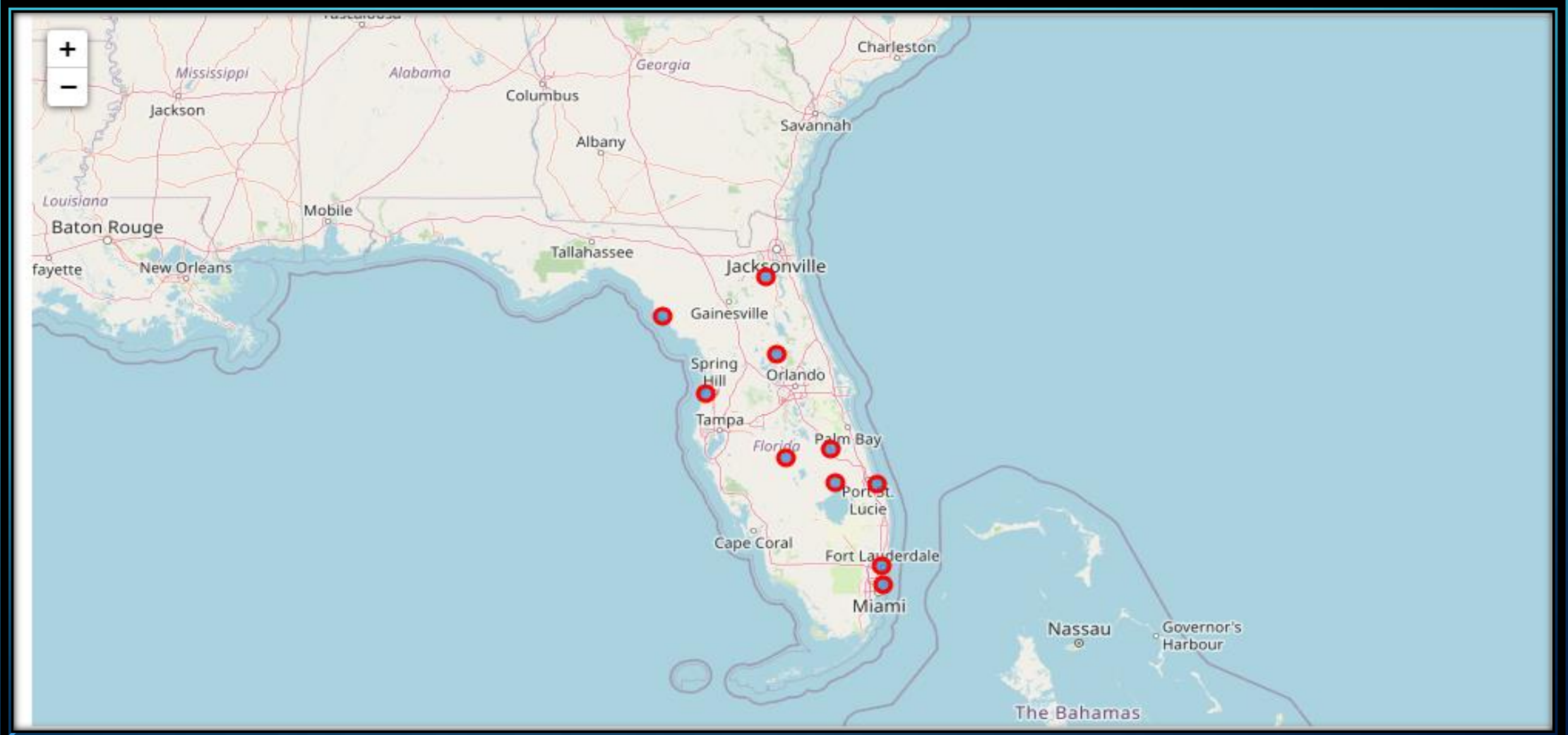
DATA SOURCES AND DESCRIPTION

Term	Data Type	Description
County _name	Object	Name of the county
lat	Float64	Latitude of the object
Ing	Float64	Longitude of the object
average income	Int64	Average income for each household in the county
population	Int64	Population of each county
Population density	Float64	Population density of each county
County	Object	Name of the county
County Latitude	Float64	Latitude of the county
County Longitude	Float64	Longitude of the county
Venue	String	Name of the venue
Venue latitude	Float64	Latitude of the venue
Venue Longitude	Float64	Longitude of the venue
Venue Category	String	Classification of the venue
Most Common Venue	String	10 most trending venues
Cluster Labels	Int64	The number of cluster in each county

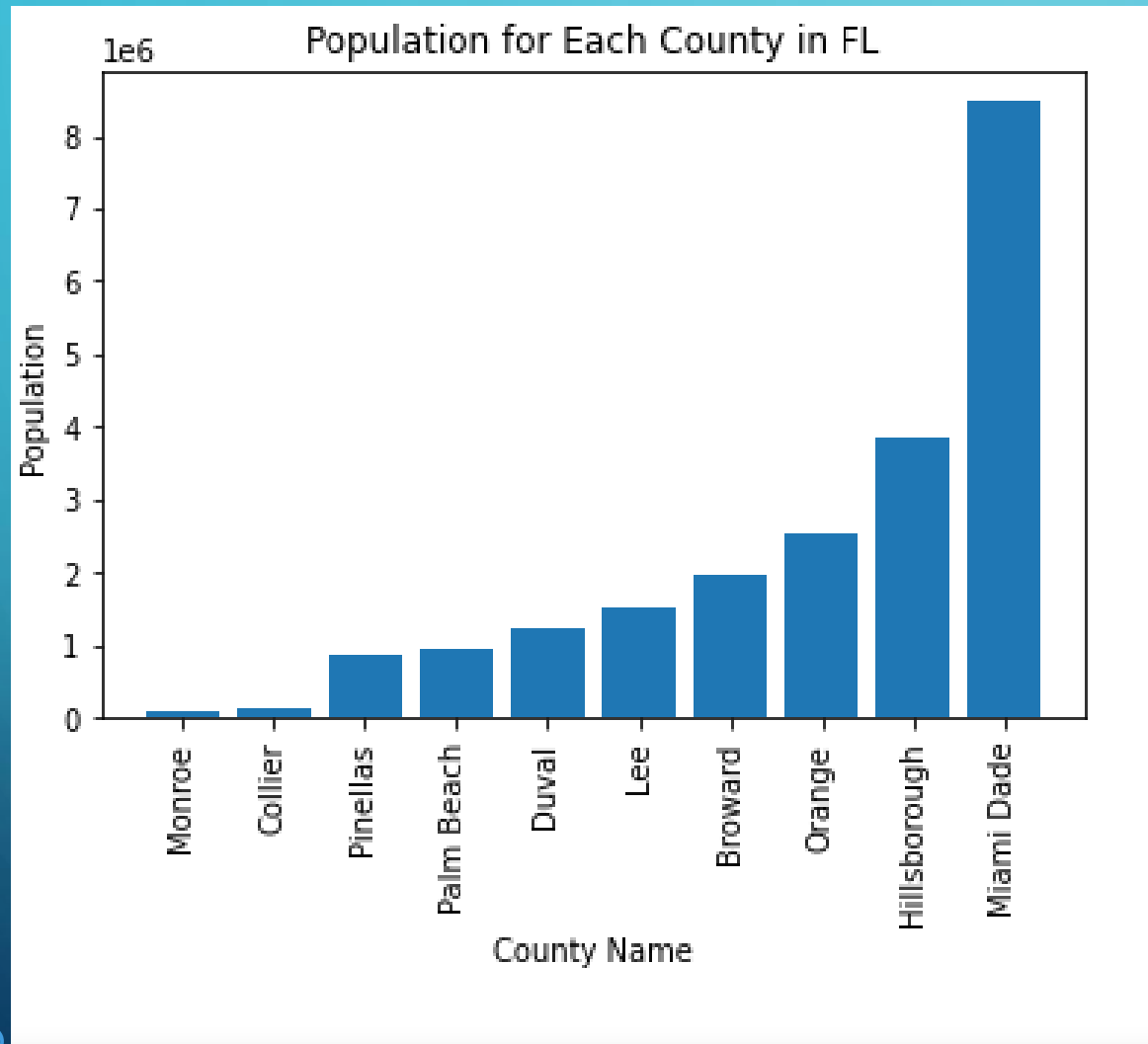


ANALYSIS AND METHODOLOGY

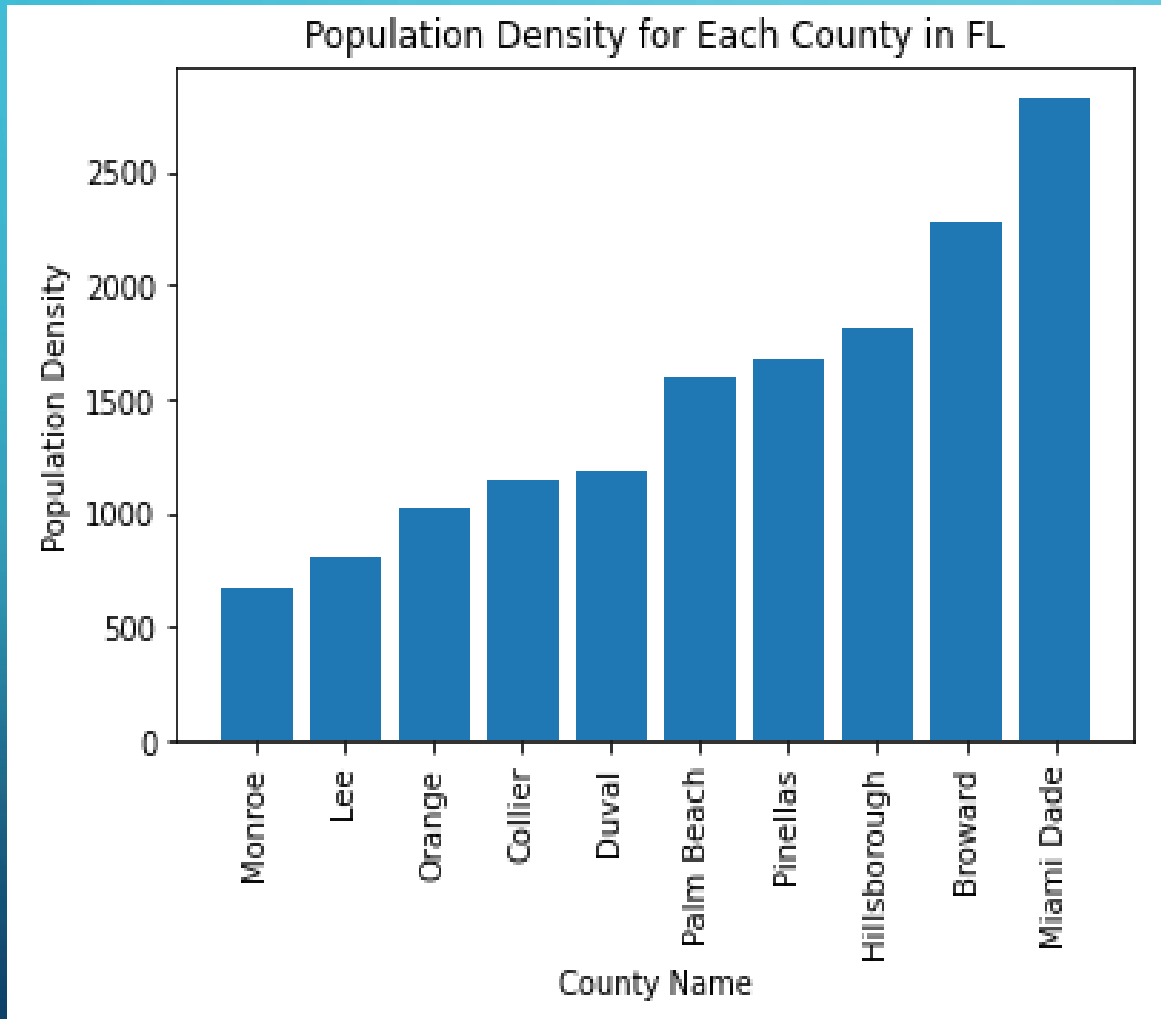
Top 10 counties in Florida



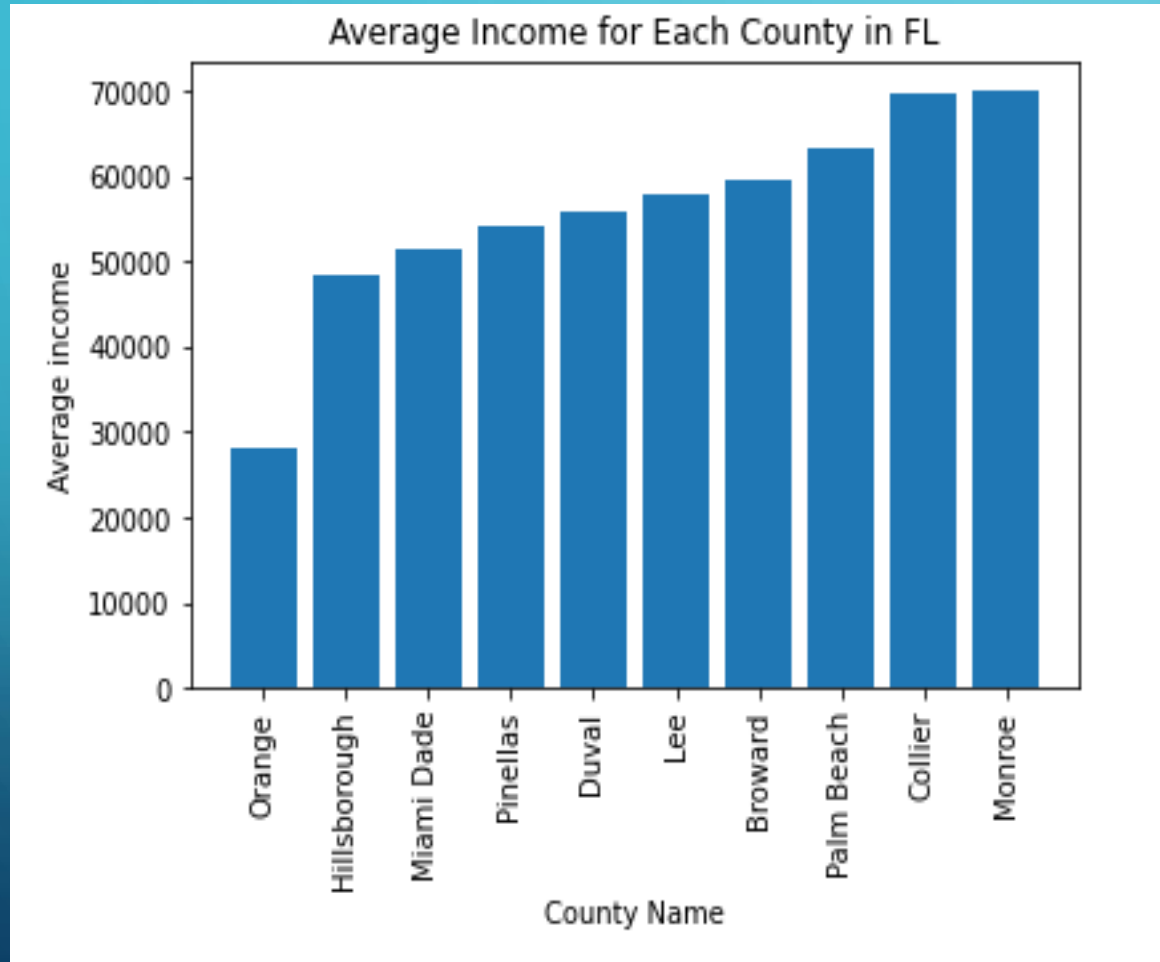
EXPLORATORY DATA ANALYSIS



EXPLORATORY DATA ANALYSIS

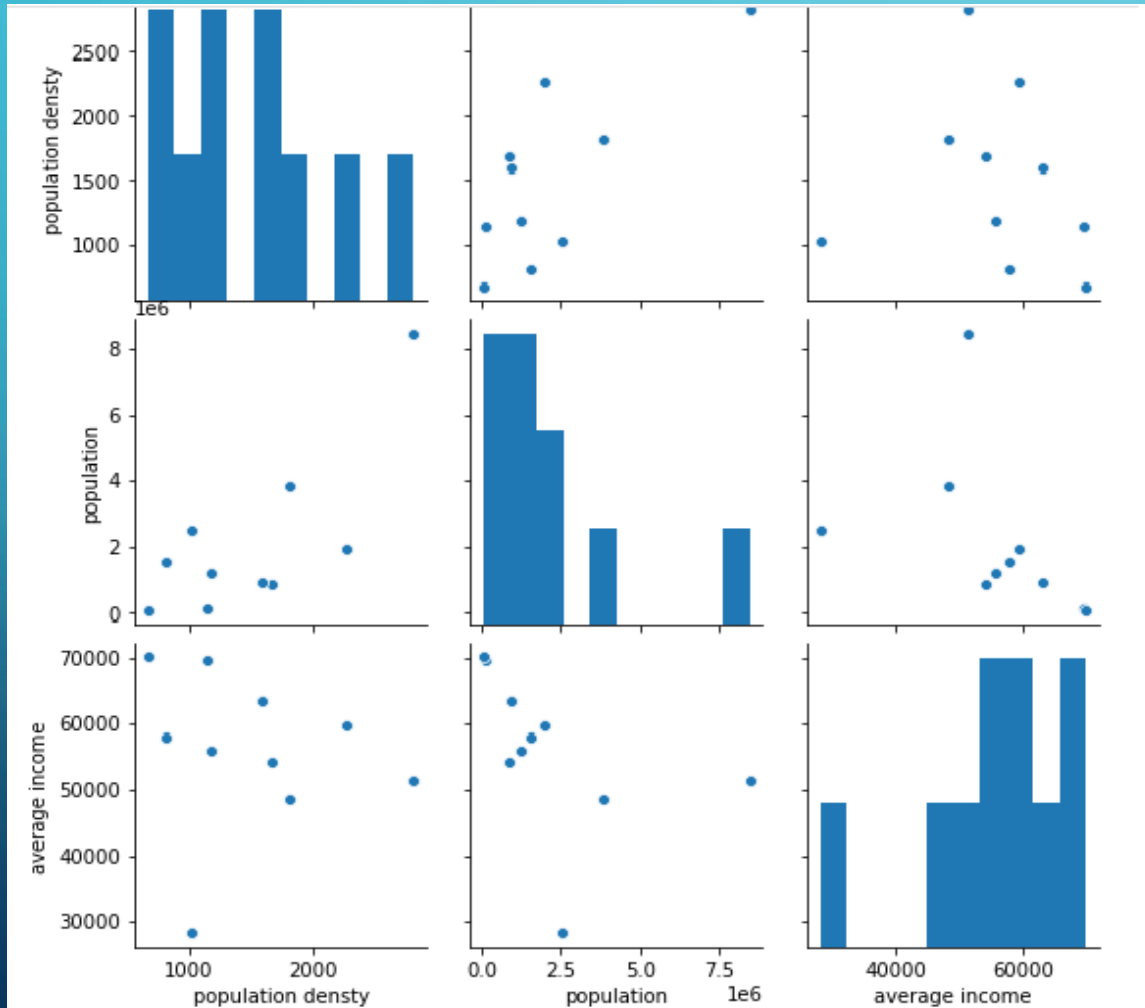


EXPLORATORY DATA ANALYSIS



EXPLORATORY DATA ANALYSIS

Pair Plot



EXPLORATORY DATA ANALYSIS

Heat map



EXPLORATORY DATA ANALYSIS

Foursquare Data

	County	County Latitude	County Longitude	Venue	Venue Latitude	Venue Longitude	Venue Category
0	Broward	26.1412	-80.1464	LeatherWerks	26.141577	-80.140398	Men's Store
1	Broward	26.1412	-80.1464	Wine Watch	26.136892	-80.140659	Wine Shop
2	Broward	26.1412	-80.1464	Laser Wolf	26.134695	-80.141203	Bar
3	Broward	26.1412	-80.1464	Hot Dog Heaven	26.136929	-80.143318	Hot Dog Joint
4	Broward	26.1412	-80.1464	Radio Active Records	26.134800	-80.137900	Record Shop

```
florida_venues['Venue Category'].value_counts()
```

```
Fast Food Restaurant    11
Sandwich Place          9
Grocery Store           8
American Restaurant     7
Pharmacy                6
Gas Station             6
Hotel                   5
Gay Bar                 5
Coffee Shop             5
Discount Store          5
Mexican Restaurant      4
Donut Shop              4
Park                    4
Pizza Place             4
Convenience Store       4
Seafood Restaurant      4
Thrift / Vintage Store  4
```


EXPLORATORY DATA ANALYSIS

Foursquare Data

	County	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	Broward	Gay Bar	Coffee Shop	Brewery	Gym	Sandwich Place	Fast Food Restaurant	New American Restaurant	Park	Thrift / Vintage Store	Clothing Store
1	Collier	Post Office	Wings Joint	Fast Food Restaurant	Cosmetics Shop	Cuban Restaurant	Dentist's Office	Diner	Discount Store	Dog Run	Donut Shop
2	Duval	Beach	Wings Joint	Cuban Restaurant	Dentist's Office	Diner	Discount Store	Dog Run	Donut Shop	Farm	Fast Food Restaurant
3	Hillsborough	Fast Food Restaurant	Pizza Place	Donut Shop	Sandwich Place	Chinese Restaurant	Discount Store	Pharmacy	American Restaurant	Grocery Store	Hotel
4	Lee	Convenience Store	Basketball Court	Gas Station	Farm	Lake	French Restaurant	Cuban Restaurant	Dentist's Office	Diner	Discount Store
5	Miami Dade	American Restaurant	Seafood Restaurant	Business Service	Italian Restaurant	Grocery Store	Pharmacy	Donut Shop	Gas Station	Home Service	Breakfast Spot
6	Monroe	Hotel	Grocery Store	Pet Service	Dog Run	Park	Café	French Restaurant	Steakhouse	Italian Restaurant	Jewelry Store

METHODOLOGY

One Hot Encoding

	County	ATM	Adult Boutique	American Restaurant	Arcade	Art Gallery	Athletics & Sports	Automotive Shop	BBQ Joint	Bank	Bar	Basketball Court	Beach
0	Broward	0.000000	0.012987	0.012987	0.012987	0.012987	0.012987	0.012987	0.000000	0.000000	0.012987	0.000000	0.0
1	Collier	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
2	Duval	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.0
3	Hillsborough	0.027027	0.000000	0.054054	0.000000	0.027027	0.000000	0.000000	0.000000	0.027027	0.000000	0.000000	0.0
4	Lee	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.166667	0.0
5	Miami Dade	0.000000	0.000000	0.081081	0.000000	0.000000	0.000000	0.000000	0.027027	0.027027	0.027027	0.000000	0.0
6	Monroe	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
7	Orange	0.000000	0.000000	0.062500	0.000000	0.000000	0.000000	0.000000	0.125000	0.000000	0.000000	0.000000	0.0
8	Palm Beach	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0
9	Pinellas	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0

```
florida_categories.shape
```

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(10, 91)
```

METHODOLOGY

K Means Clustering

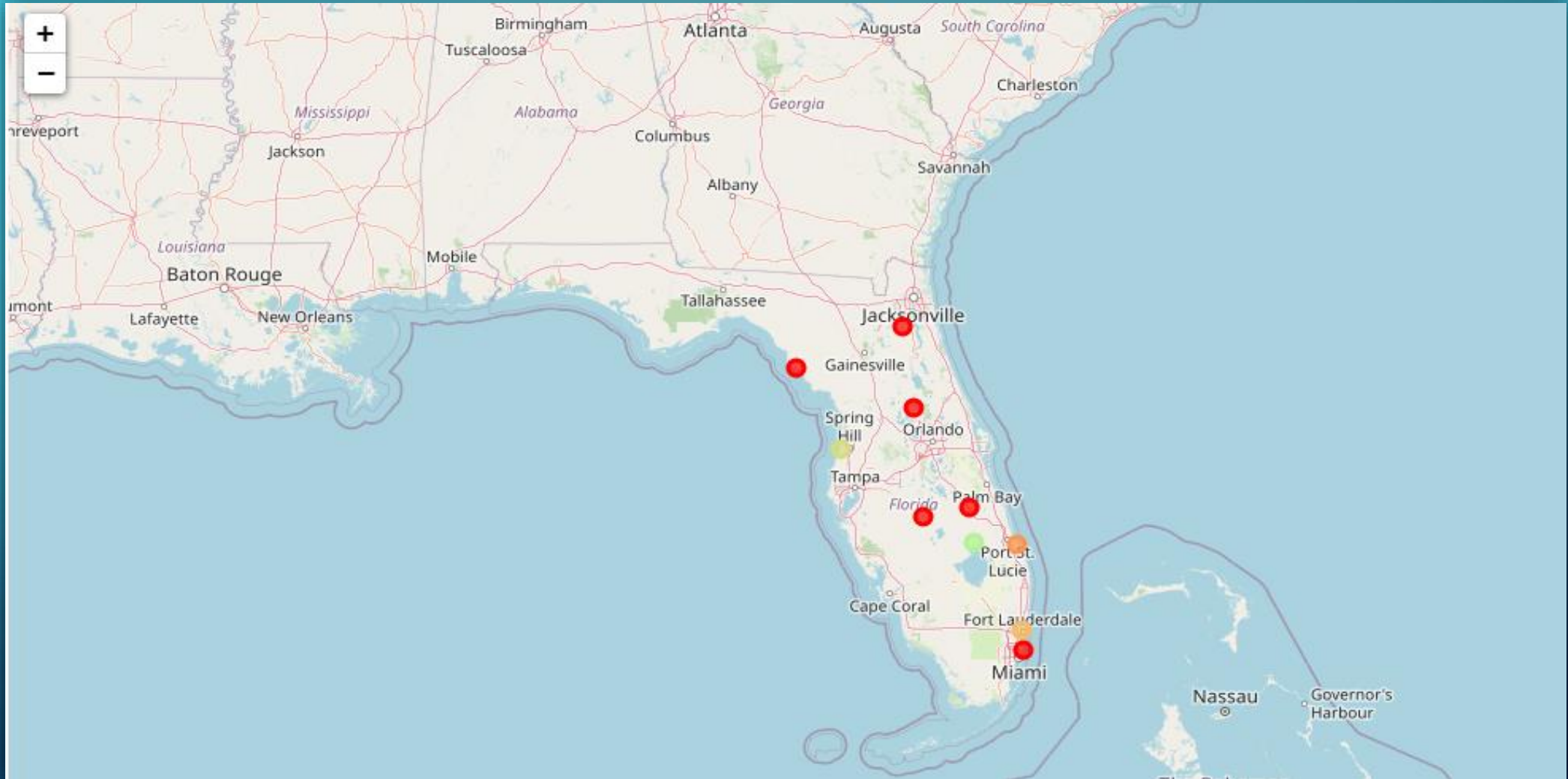
	County	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	Cluster labels
0	Broward	Gay Bar	Coffee Shop	Brewery	Gym	Sandwich Place	Fast Food Restaurant	New American Restaurant	Park	Thrift / Vintage Store	Clothing Store	12
1	Collier	Post Office	Wings Joint	Fast Food Restaurant	Cosmetics Shop	Cuban Restaurant	Dentist's Office	Diner	Discount Store	Dog Run	Donut Shop	0
2	Duval	Beach	Wings Joint	Cuban Restaurant	Dentist's Office	Diner	Discount Store	Dog Run	Donut Shop	Farm	Fast Food Restaurant	0
3	Hillsborough	Fast Food Restaurant	Pizza Place	Donut Shop	Sandwich Place	Chinese Restaurant	Discount Store	Pharmacy	American Restaurant	Grocery Store	Hotel	0
4	Lee	Convenience Store	Basketball Court	Gas Station	Farm	Lake	French Restaurant	Cuban Restaurant	Dentist's Office	Diner	Discount Store	0
5	Miami Dade	American Restaurant	Seafood Restaurant	Business Service	Italian Restaurant	Grocery Store	Pharmacy	Donut Shop	Gas Station	Home Service	Breakfast Spot	13
6	Monroe	Hotel	Grocery Store	Pet Service	Dog Run	Park	Café	French Restaurant	Steakhouse	Italian Restaurant	Jewelry Store	0

MODEL RESULTS

- 19 Food establishments – This includes restaurants, donut shops, diners and fast food restaurants
- 7 Home essentials –This includes home services, discount stores and pharmacies
- 1 Clothing store
- 10 Other establishments. This ranged from dentists, post offices, cosmetic shops gas stations and hotels



CLUSTER LOCATIONS



CONCLUSION

Counties Identified for Business

- Broward
- Miami Dade
- Orange
- Pinellas

Business recommendation

- Food / Restaurant
- Other – Gas station / Hotel / Home Essentials



[illegible]