

# Location Recommendation for Jadeite Jade Jewelry Store in St. Louis County, MO, United States



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# Introduction

- Jadeite and nephrite two gemstones correctly called jade by international gem and jewelry industry.
- High Quality Jadeite can be more expensive per carat than diamond
- Cultural history and significance in:
  - Asia
  - North and Central America
  - New Zealand



# Introduction

- Jadeite jade comes in colors besides green, including:
  - White
  - Black
  - Lavender
  - Yellow
  - Blue



# Introduction: Business Problem

- Primary market for high quality jadeite is people of Asian race and ethnicity
- I am interested in opening a jewelry store specializing in jadeite jade in the Saint Louis metro area of Missouri, United States.
- Business Problem and question: Where in St. Louis County should I locate my jadeite store?

# Introduction

- I am the shareholder and person interested in this data analysis project.
- If there is not a sizable market and I do not locate my jadeite store close to that market the business will likely fail.
- I also want to locate the store in a safe area, area with good employment, and an area with other high end retail goods(these characteristics will be analyzed in the future).

# Introduction

- This analysis will focus on:
  - Using FourSquare API to return venues for the postcodes within St. Louis County.
  - Clustering using unsupervised learning K-means algorithm for clustering post codes in St. Louis County
  - Observational study of Asian race and ethnicity demographics from an online source.

# Data Aquisition

- All cities and zip codes in St. Louis County, MO were obtained at: (<https://www.zip-codes.com/county/mo-saint-louis.asp>) by copying and pasting into a Microsoft Excel file.
- All zip codes and their corresponding latitude and longitude coordinates for the United States were downloaded at: ([www.pier2pier.com/links/files/Countrystate/USA-Zip.xls](http://www.pier2pier.com/links/files/Countrystate/USA-Zip.xls)).
- Maps and figures from: <https://statisticalatlas.com/county/Missouri/St-Louis-County/Race-and-Ethnicity#data-map/tract> were captured as screenshots and pasted into this report.



# Methodology: Data Pre-Processing

- Excel file containing zip codes and city names was read into the Jupyter notebook and converted into a Pandas data frame.
- The column name of zip codes was changed to “Postcode” to match the column name of “Postcode” in the data set of all United States postcodes.
- The Excel file containing all United States postcodes was read into the Jupyter notebook as a csv file and converted into a data frame.
- New data frame made with postcodes for state of Missouri only
- Data frame with all postcodes for St. Louis County and data frame with all postcodes and latitude and longitude coordinates of the state of Missouri were merged on “Postcode” resulting in one data frame with the latitude and longitude coordinates for each postcode in St. Louis County, Missouri.

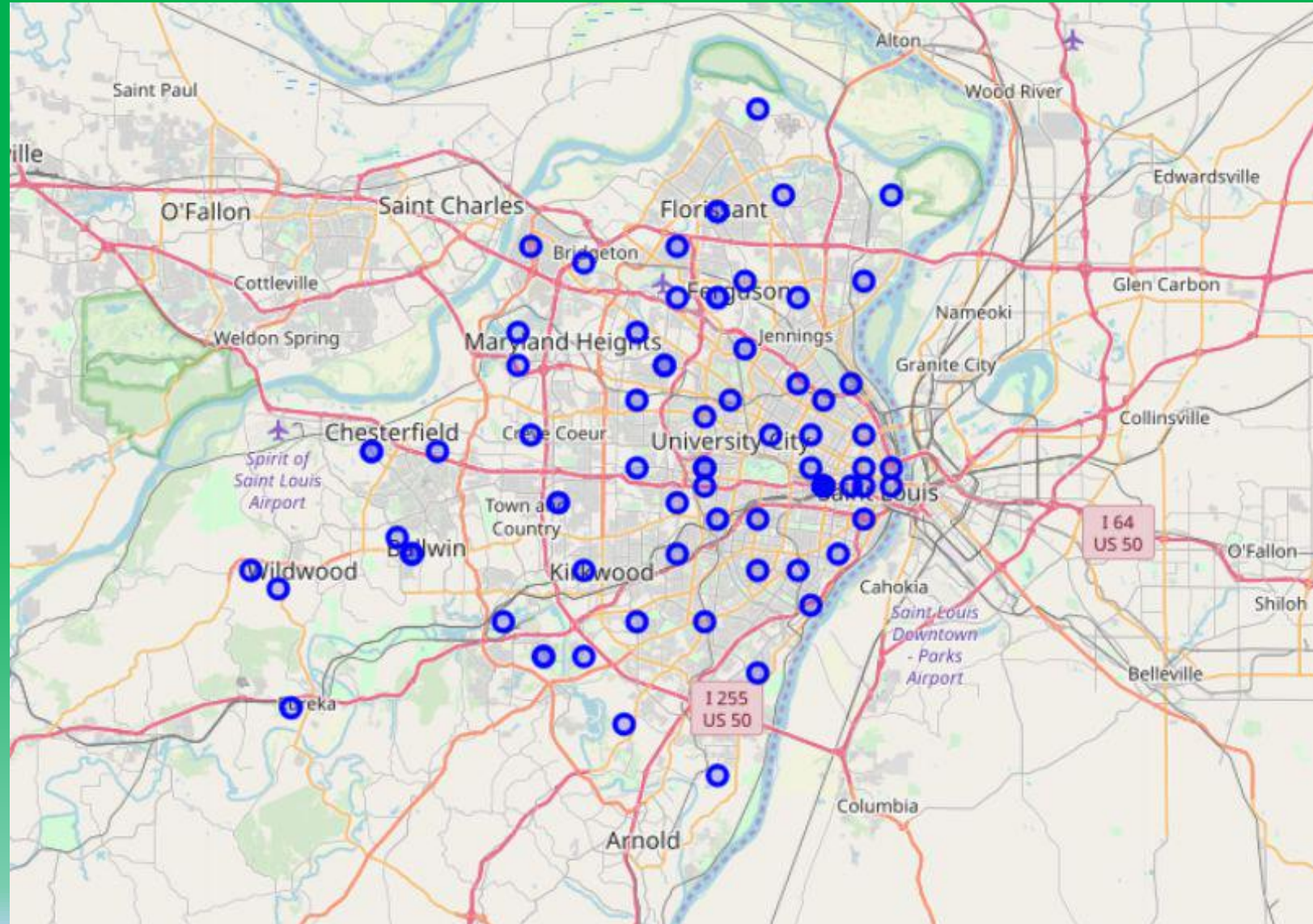


# Methodology: Mapping

- Geocoder was used to get latitude and longitude coordinates of the State of Missouri with output reading: “The geographical coordinates of the state of Missouri, US are 38.7604815, -92.5617875”.

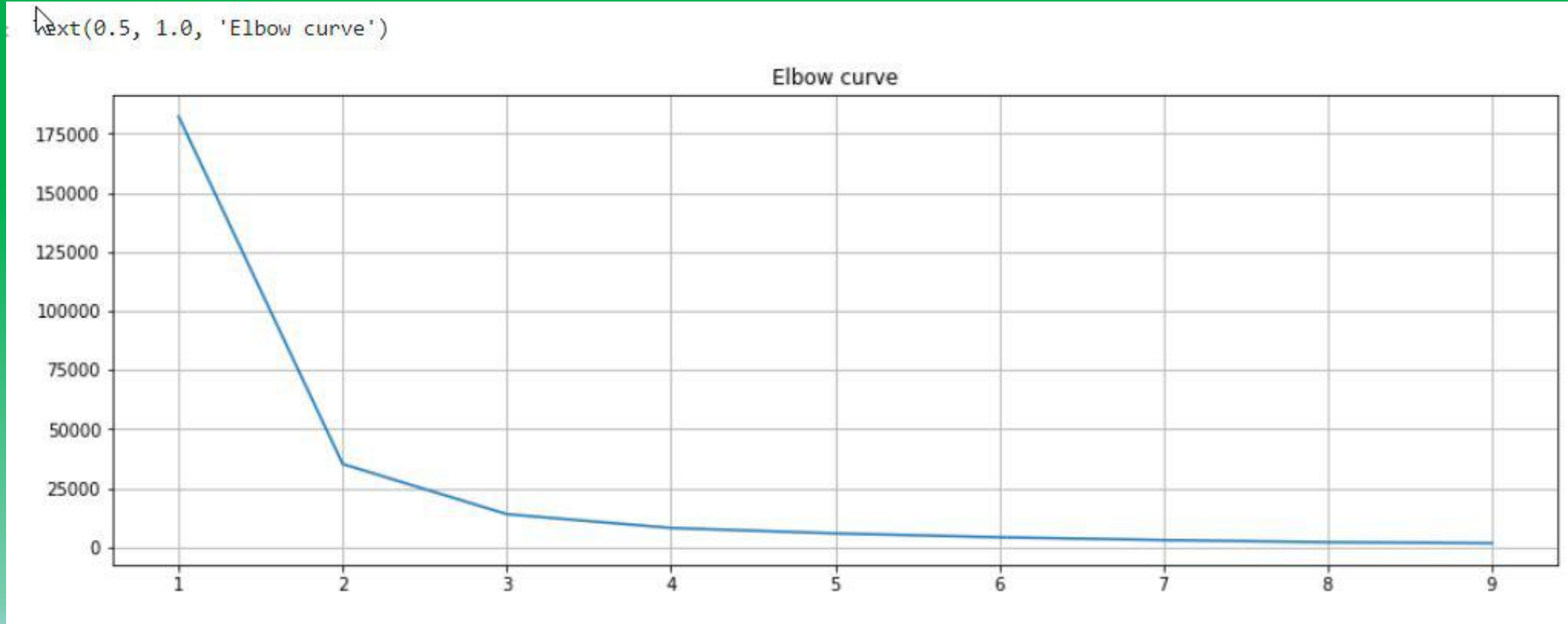
# Methodology: Mapping and Venues

- Folium was used to create a map showing all postcodes in St. Louis County.
- Means of each frequency of venue per postcode was calculated and top five types of venues in each postcode were displayed.



# Methodology: K-Means Clustering

- Elbow method used to construct a graph to determine the optimal number of clusters (K). X axis = number of K, Y axis = Distortion
- Optimum K value at 2 or 3 at the “elbow” of the line. Value of 3 chosen to give a greater variety of clusters.



# Methodology: K-Means Clustering

- Output showing postcodes with NaN values for venues and cluster numbers.
- These postcodes were deleted from analysis.

Postcode	Municipality	County	Neighbourhood	Borough	Latitude	Longitude	Cluster Labels	1st Most Common Venue	
50	63127	Sappington	St. Louis County	Saint Louis	MO	38.53	-90.42	NaN	NaN
51	63128	Sappington	St. Louis County	Saint Louis	MO	38.49	-90.39	NaN	NaN
52	63129	St. Louis	St. Louis County	Saint Louis	MO	38.46	-90.32	0.0	Italian Restaurant
53	63130	University City	St. Louis County	Saint Louis	MO	38.67	-90.33	0.0	Park
54	63131	Des Peres	St. Louis County	Saint Louis	MO	38.62	-90.44	1.0	Lounge
55	63131	Frontenac	St. Louis County	Saint Louis	MO	38.62	-90.44	1.0	Lounge
56	63132	Olivette	St. Louis County	Saint Louis	MO	38.68	-90.38	NaN	NaN
70	63146	St. Louis	St. Louis County	Saint Louis	MO	38.70	-90.47	NaN	NaN



# Results

Venues of interest from  
FourSquare API search  
for postcodes in St. Louis  
County.

-----63114-----			-----63116-----		
	venue	freq		venue	freq
0	Plaza	0.1	0	Zoo	0.25
1	Discount Store	0.1	1	Arcade	0.25
2	Park	0.1	2	Jewelry Store	0.25
3	Mexican Restaurant	0.1	3	Bakery	0.25
4	Chinese Restaurant	0.1	4	Pet Café	0.00

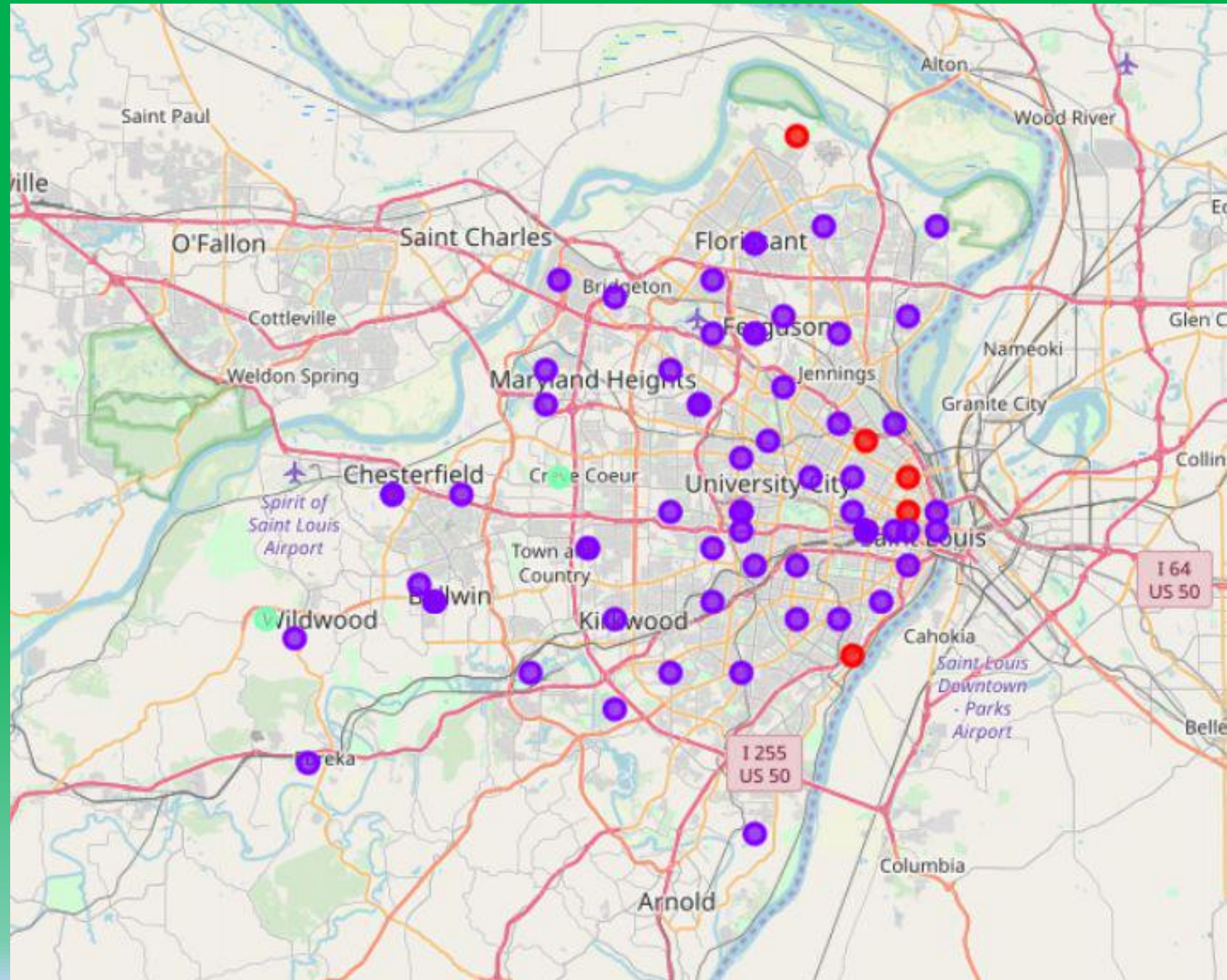
  

-----63144-----			-----63145-----		
	venue	freq		venue	freq
0	Spa	0.1	0	Brewery	0.14
1	Chinese Restaurant	0.1	1	Gym	0.14
2	Sports Bar	0.1	2	Japanese Restaurant	0.14
3	Rental Car Location	0.1	3	Thrift / Vintage Store	0.14
4	Italian Restaurant	0.1	4	Lounge	0.14

**Figure 5.** Selected postcodes of St. Louis County, MO, United States showing venues of interest(Chinese Restaurant, Jewelry Store, Spa, and Japanese Restaurant) for potential jadeite jade jewelry store location.

# Results

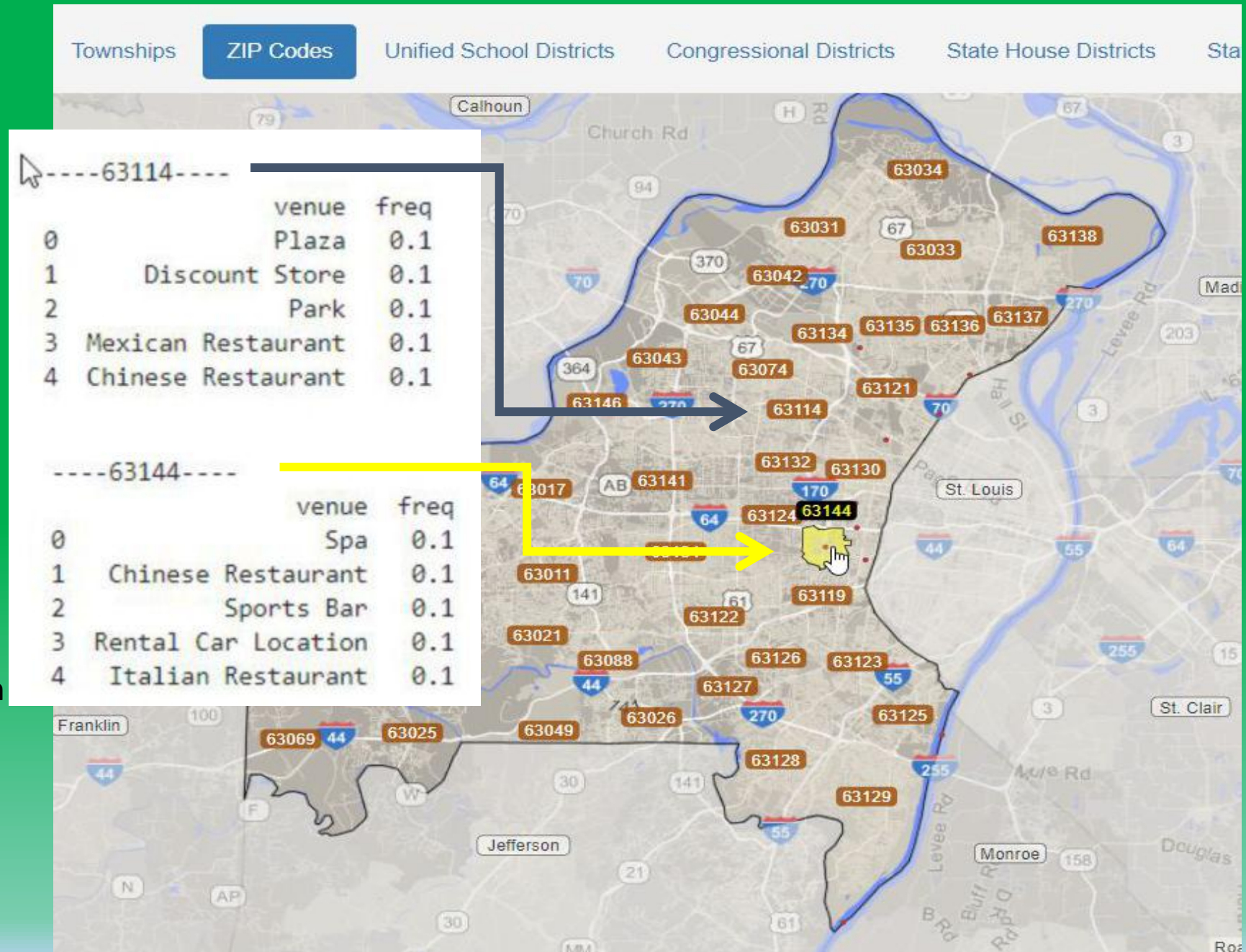
- Map of 3 clusters from K-Means clustering of postcodes in St. Louis County.
- Note: two bluish green points by Creve Coeur and Wildwood can be hard to see.
- Clusters were spread over a wide area.
- Clusters contained a large variety of venue types such that clusters were not named
- No clusters had venues that indicate large market potential for my jadeite store.





# Results

- Looking at post codes 63114(Breckinridge Hill) and 63144(Brentwood) location.
- Zip codes are close together so this is an area to investigate further as a potential location for my store based on venue type shown.
- Map is from: <https://statisticalatlas.com/country/Missouri/St-Louis-County/Ancestry>
- Accessed July 22, 2019).





# Results

- Bar Chart showing Asian population as a percent of the population in St. Louis County.
- Chart from:  
<https://statisticalatlas.com/county/Missouri/St-Louis-County/Race-and-Ethnicity>, Accessed July 23, 2019).
- 63114(Breckinridge Hill) Does not appear on the chart.
- 63144(Brentwood) 9th on the chart with population of 6.5%
- Evidence that these postcodes may not have the target market I am looking for.
- Next, look at the locations of the areas with the highest Asian populations.

## Asian Population by Place

#30

Percentage of the total population.

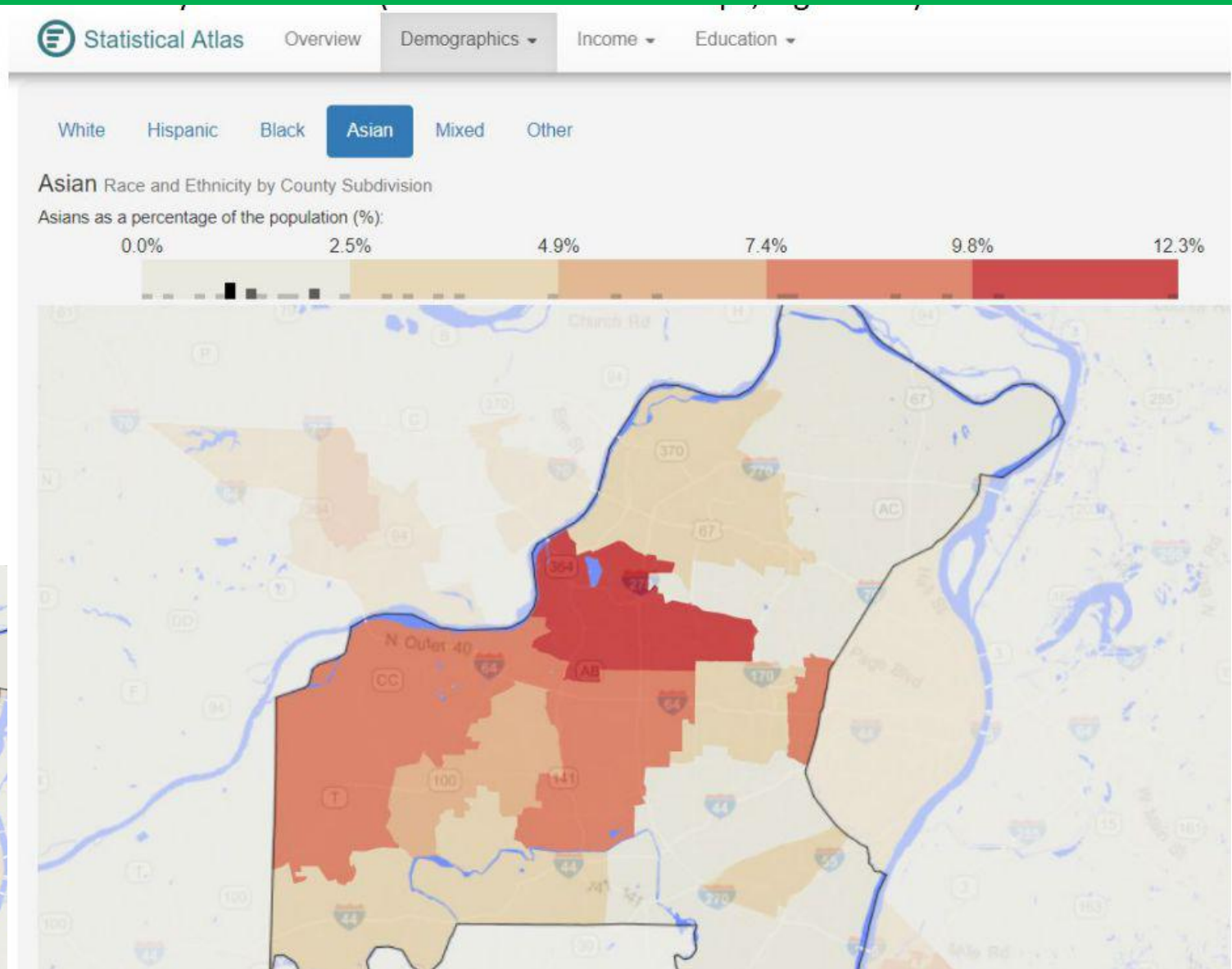
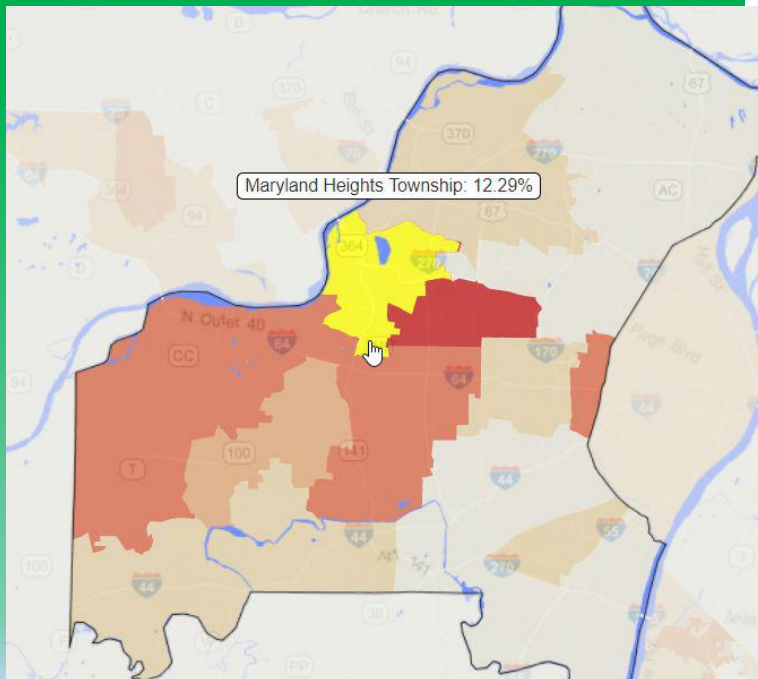
Scope: population of St. Louis County, selected places in St. Louis County, and entities that contain St. Louis County



# Results

Right Map: Asian race and ethnicity by county subdivision.

Lower Left Map: Yellow area is Maryland Heights Township and a central location of higher Asian population and potential location for my jadeite store.



Maps from: <https://statisticalatlas.com/county/Missouri/St-Louis-County/Race-and-Ethnicity>, Accessed July 23, 2019).

# Conclusions

- Searching FourSquare API by venues for postcodes in St. Louis and Clustering by K-means did not reveal definitive locations for a jadeite jade jewelry store.
- Asian race and ethnicity demographics for St. Louis County show that the southern area of Maryland Heights Township is a central area for higher percentage of Asian population in St. Louis County and is a location to research further as a potential location for jadeite jewelry store.
- Future research will focus on clustering the postcodes of St. Louis as a city by a radius smaller than 500 meters
- The area of Olivette and University City needs further research due to personal knowledge of many Asian restaurants and stores along Olive BLVD.