

# NEIGHBORHOOD VENUES ANALYSIS FOR CAFÉ & BAR CRAWLS

CINCINNATI, OH

IBM APPLIED DATA SCIENCE CAPSTONE

BY ANTHONY CANTERBURY 2019



# BUSINESS PROBLEM

Within the city of Cincinnati, OH a nonprofit organization wants to put on a series of outreach events which take donating participants to multiple neighborhood cafés and bars to socialize. To make it successful the collections of venues in these locations must meet several criteria:

- First the location must have at least two cafés and two bars in proximity. Seven venues max per cluster. *Can seven be considered within walking distance (less than 0.5 miles apart)?*
- The venues must be open sometime on Saturdays between 3pm and 10pm.
- The venues must be popular (well-reviewed).
- The venues must not be expensive.

# DATA

Data required and sources:

- List of Neighborhoods within Cincinnati, OH. A list of the 50 neighborhoods with approximate geographical boundaries comes from the “Cincinnati Area Geographic Information System” <https://data-cagisportal.opendata.arcgis.com/datasets/cincinnati-sna-boundary>
- List of neighborhood venues with hours, reviews (ratings and likes) and approximate prices. This data will be supplied by the Foursquare API.

# SAMPLE DATA BEFORE VENUE DETAILS

	Neighborhood	BusinessDistrict	NeighborhoodLatitude	NeighborhoodLongitude	VenueName	VenueId	VenueLatitude	VenueLongitude	VenueCategory
0	Linwood	0	39.104213	-84.415924	Dennert H Distri	4f32494419836c91c7c8b7f7	39.108777	-84.421232	Wine Bar
1	East Walnut Hills	1	39.128889	-84.476823	The Woodburn Brewery & Taproom	55461bf6498eac118325e62e	39.129030	-84.476892	Beer Bar
2	East Walnut Hills	1	39.128889	-84.476823	Myrtle's Punch House	5473d783498ec0bbca9021d6	39.124276	-84.476130	Cocktail Bar
3	East Walnut Hills	1	39.128889	-84.476823	The Growler House	545d54ab498ea427d9af9d2d	39.129763	-84.477778	Bar
4	East Walnut Hills	1	39.128889	-84.476823	BrewRiver Gastropub	4fea02ede5e8dfeeb65b5000	39.121758	-84.475027	Gastropub
5	East Walnut Hills	1	39.128889	-84.476823	The Skunk Lounge	5182cdbd498e1c1b38b47f1c	39.124213	-84.476246	Lounge
6	East Walnut Hills	1	39.128889	-84.476823	Cliche	5d6459abca17630008abf539	39.123820	-84.477040	Bar

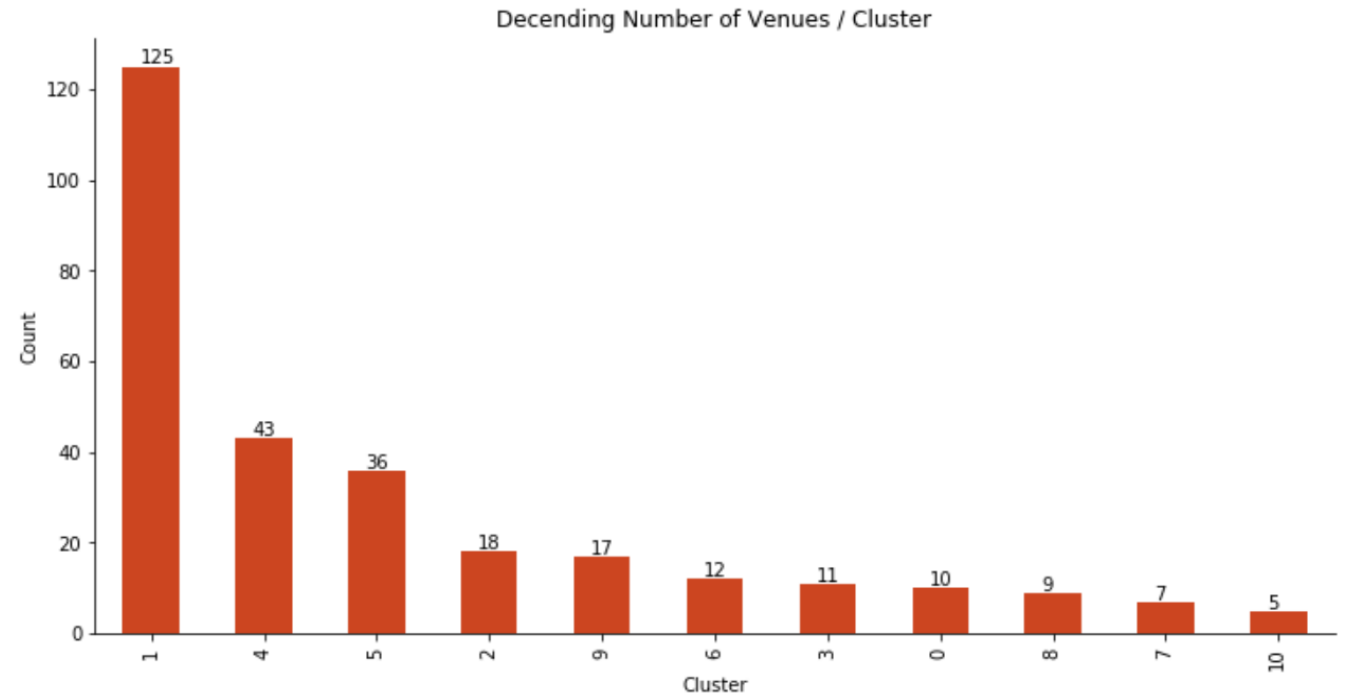
# METHODOLOGY

- Input parameters that support the problems study
- Pull geo data from city APIs
- Get latitude and longitude of neighborhood business district centers by calculating centroids
- Grab venue name and location data based on centroids from the Foursquare API
- Cluster venues with a DBSCAN
- Pull and parse venue hours from Foursquare API
- Use k-nearest neighbor to calculate missing hours
- Drop closed venues at event time
- Pull and parse ratings, likes, and prices from Foursquare API
- Drop prices out of range
- Analyze cleaned data with map and scatter charts
- Make recommendations based on weighted criteria

# ANALYSIS

## Neighborhoods and Clusters

DbCluster	Neighborhoods
0	[East Walnut Hills]
1	[Queensgate, West End, Mt. Auburn, Downtown, Over-the-Rhine, Pendleton]
2	[Northside]
3	[Roselawn]
4	[Mt. Auburn, Avondale, Clifton, Clifton Heights, Corryville, Walnut Hills]
5	[Hyde Park, Oakley]
6	[Evanston, North Avondale]
7	[Pleasant Ridge, Kennedy Heights]
8	[East End, Columbia Tusculum, Mt. Lookout]
9	[Westwood]
10	[West Price Hill]

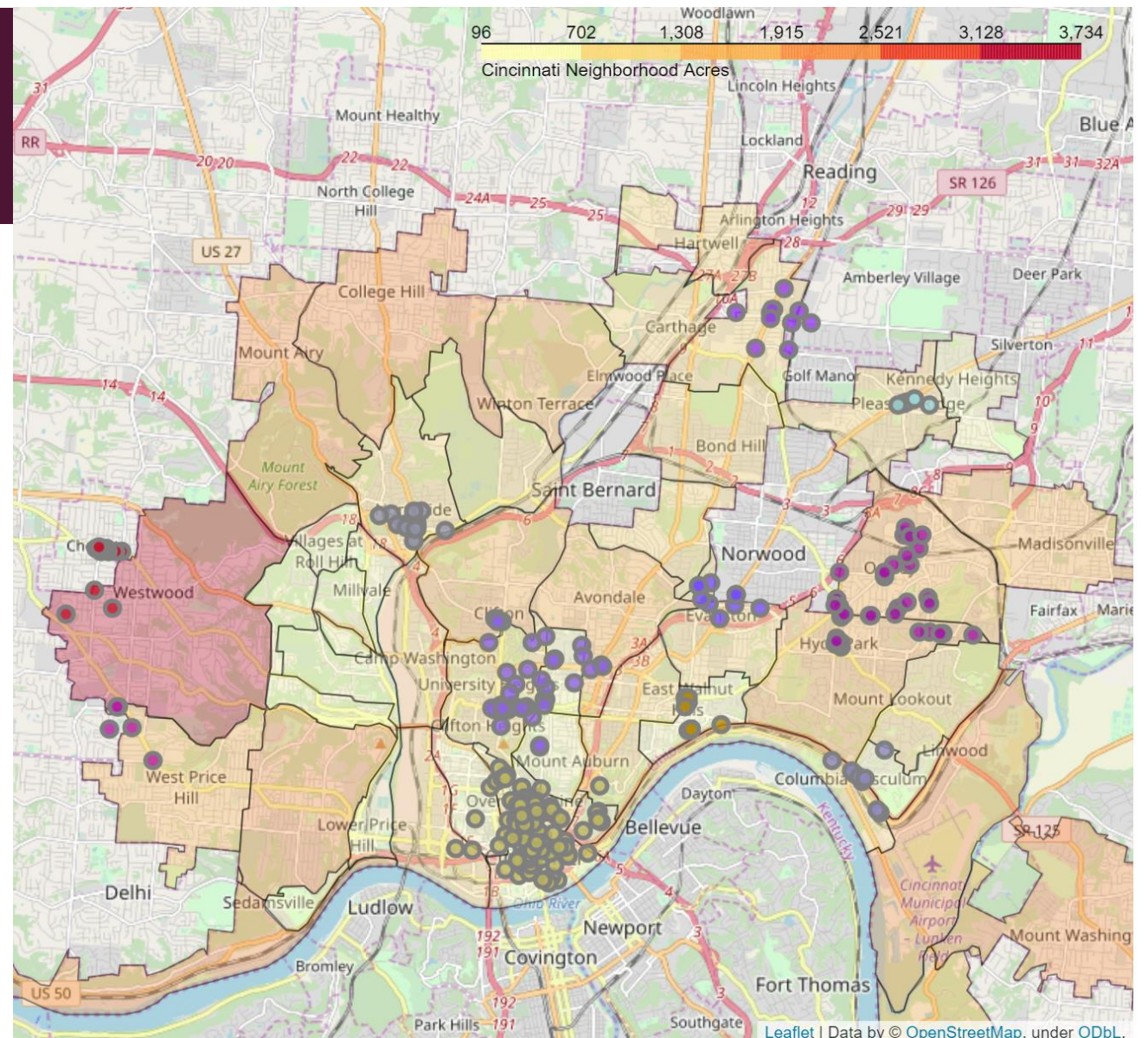




# TOP VENUE CLUSTERS

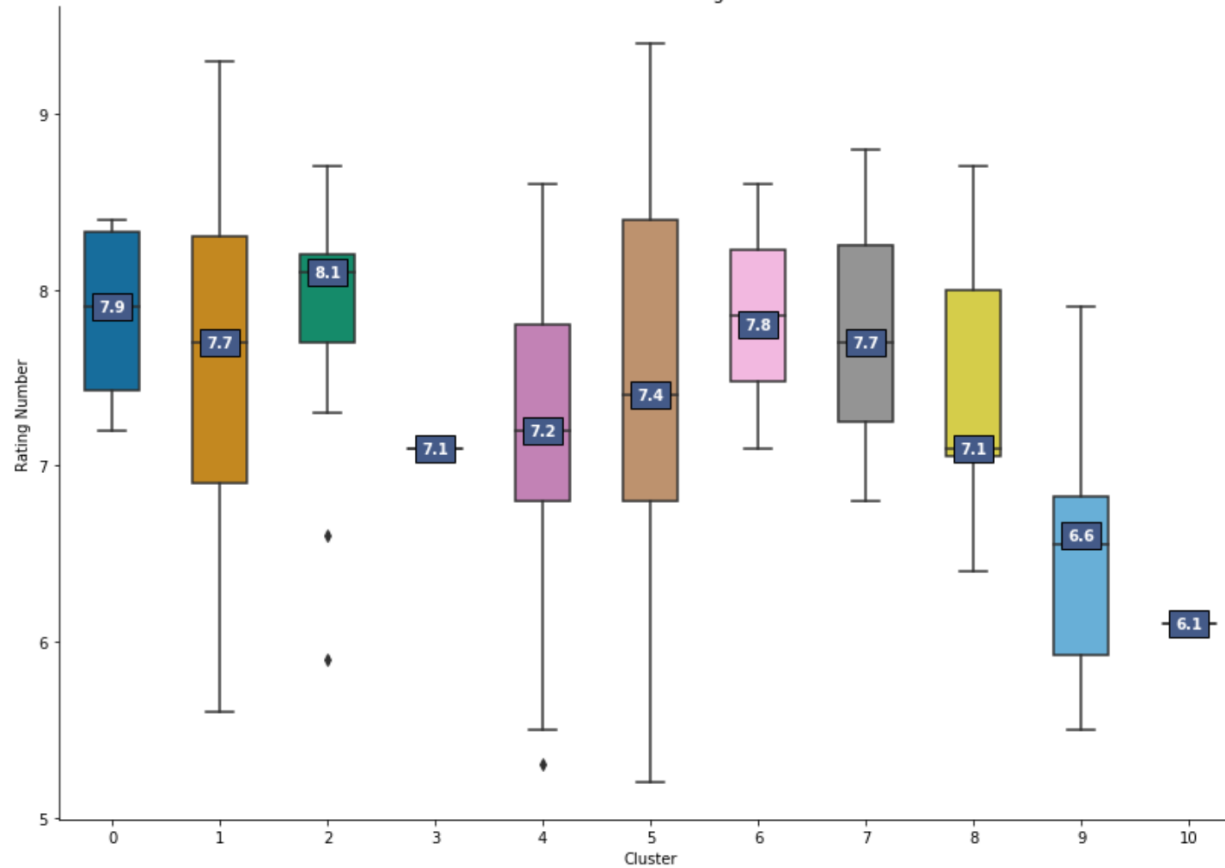
Notable clusters:

- Yellow are Downtown neighborhoods (cluster 1)
- Middle purple are the Clifton neighborhoods
- Grey above Clifton is Northside

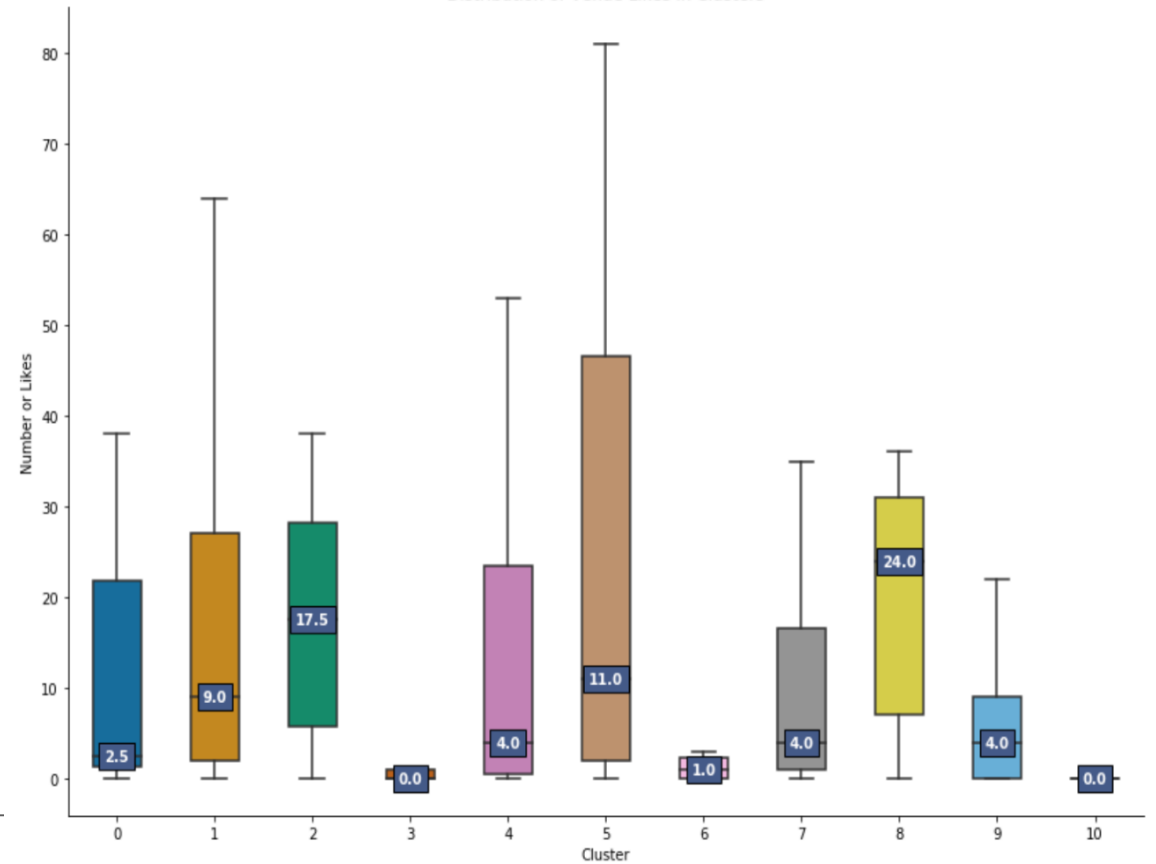


# MORE ANALYSIS

Distribution of Venue Ratings in Clusters



Distribution of Venue Likes in Clusters

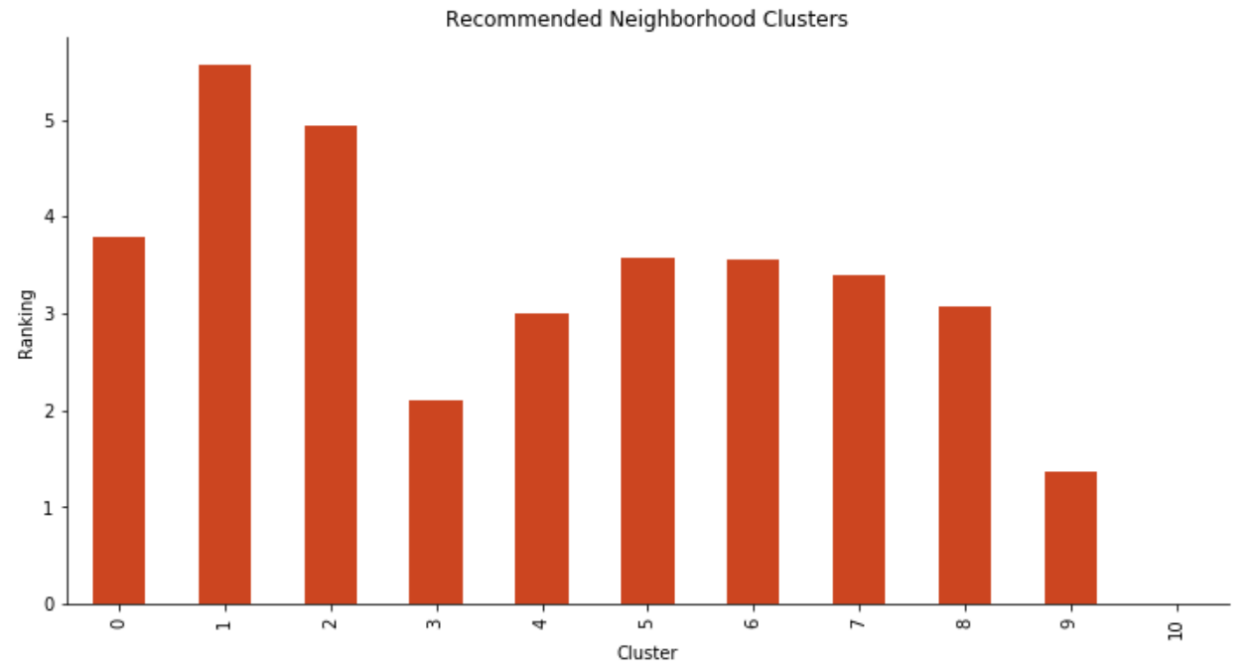




# RECOMMENDATIONS

Rankings of clusters previously shown based on ratings, number of venues, and lastly likes.

Higher is better

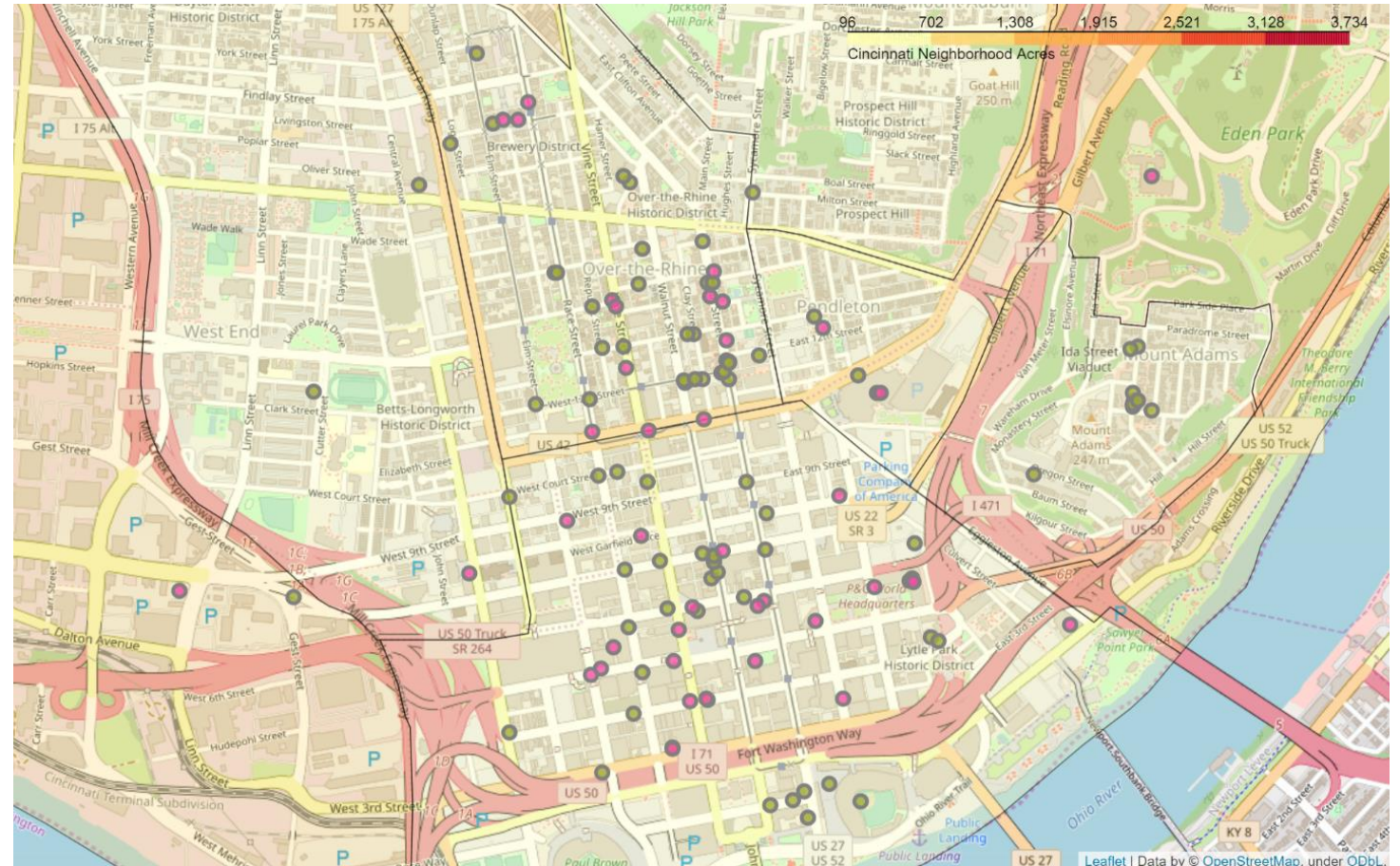


# DOWNTOWN WINS

Downtown crawl venues:

- Green are bar type venues
- Pink are café type venues

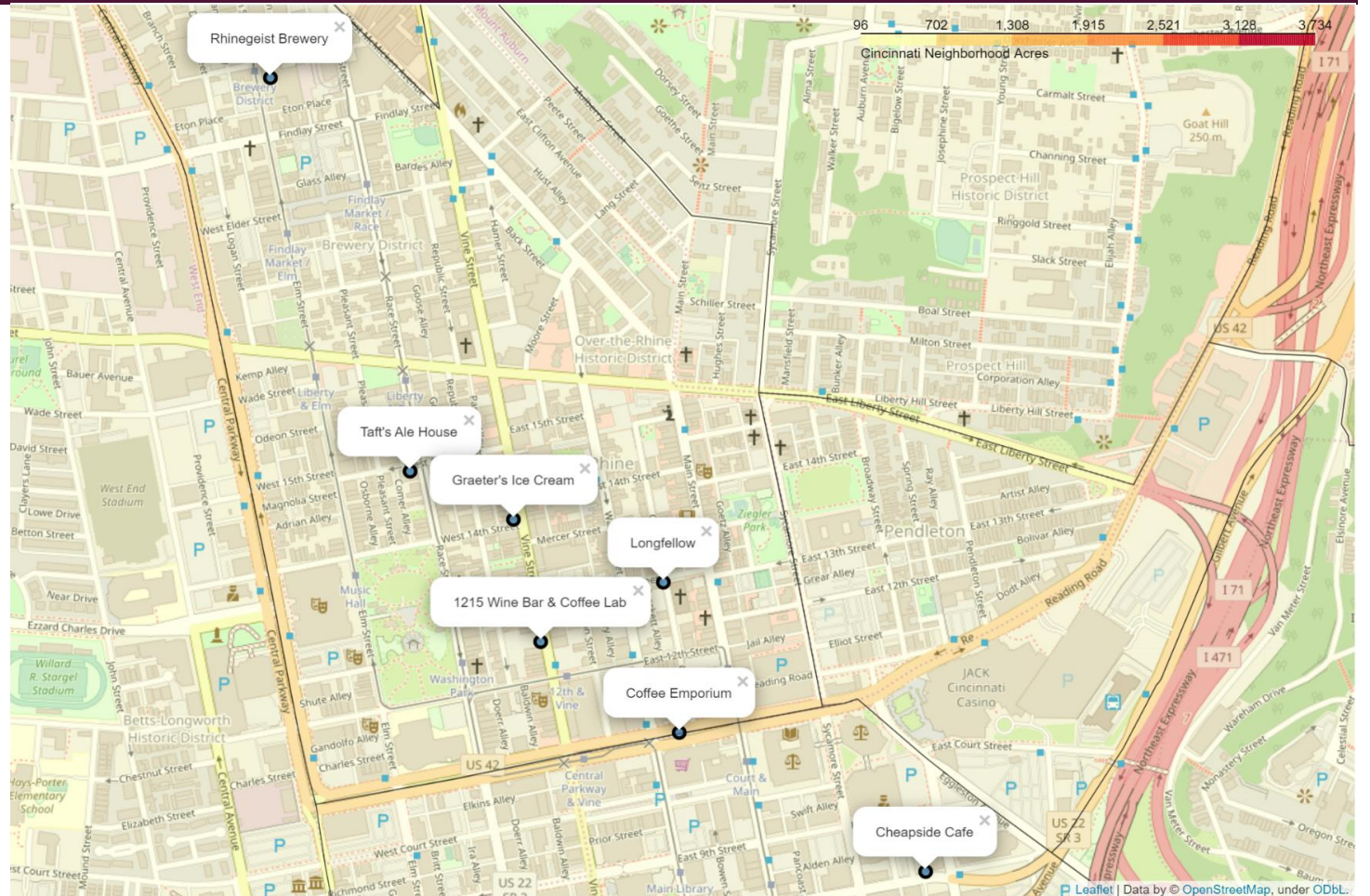
Nice distribution of both.





# TOP VENUES

VenueName	VenueLatitude	VenueLongitude	VenueRating	VenueLikes	VenuePrice
Rhinegeist Brewery	39.117221	-84.520129	9.3	460.0	1.0
Taft's Ale House	39.111378	-84.517476	9.3	304.0	2.0
Coffee Emporium	39.107498	-84.512390	9.1	279.0	1.0
Graeter's Ice Cream	39.110662	-84.515525	9.0	51.0	2.0
Cheapside Cafe	39.105442	-84.507739	8.9	91.0	1.0
Longfellow	39.109734	-84.512704	8.9	25.0	2.0
1215 Wine Bar & Coffee Lab	39.108851	-84.515014	8.8	101.0	2.0



# CONCLUSIONS

- Largest venue clusters are near a downtown and will encompass many neighborhoods.
- Ratings while important for this recommendation can be overridden by a dense cluster.
- While rating are a reliable metric likes are not for this type of recommendation.
- Lots of great choices in Cincinnati.



# CHEERS

And Thank You!