Applied Data Science Capstone

Final Report

Battle of West Suburbs of Phoenix, AZ - Mexican Restaurants

Prepared by

Jerry Mooth

August, 2019

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Statement of Business Problem

Mexican food in the Phoenix area is *big*. One could say it comes from the fact that Hispanics make up 41% of the greater Phoenix population (compared to 17% of the overall US). However, taken from a non-Hispanic such as myself, I believe it is simply because:

- Given the large Hispanic population, the food will be prepared correctly; if not, it won't sell
- Mexican food is just really, really good

I live in Litchfield Park, a west suburb of Phoenix. It is a very small city. The dominant city in my area is Goodyear, which borders nearly all the other west side towns. That is what I am choosing to be the central point of my analysis.

The problem is basically ***where do I go for the best Mexican food***. It is a challenge to know:

- Which area of town has the best Mexican food?
- What are the best Mexican restaurants in my area?
- What are the best Mexican restaurants in each west side city?
- Should I go to a national chain, local chain, or a mom-and-pop restaurant?
- Do I even need to care about ratings and just assume they're all good?

I will use data to analyze the area restaurants and draw some conclusions based on customer ratings.

Data to be Used

Foursquare is the data source to be used for my analysis. Foursquare provides a **Places API** that will be used to gather a list of Mexican restaurants centered in Goodyear, AZ, and then will find the average customer rating for each venue.

Query #1 - Mexican restaurants in West Valley

Using the Foursquare Places API, a “venues search” will return a list of restaurants. These are the search criteria to be used:

- Near = Goodyear, AZ (this was chosen over latitude/longitude values as I felt the results returned were generally better)
- Category ID = ‘4bf58dd8d48988d1c1941735’ (the category ID assigned by Foursquare to denote Mexican restaurants)
- Radius = 10000 meters (a large radius needed as the layout of the West Valley is that places in general are more spread out than one would find in a city)
- Limit = 100 (the free Foursquare developer account actually limits the search results to 50 venues)

(display returned venue list)

Query #2 - average rating for each restaurant

The next step is to perform a Foursquare “venue detail” lookup for each restaurant that will return the average rating for each venue.

To do this search, each venue’s ID found in the Foursquare “venues search” is passed to the Places API, and the rating is then returned. The rating is extracted into its own dataframe along with the venue ID.

(display first five returned results)

Build dataset for analysis

The final step is to merge the two dataframes to a single list that contains these columns:

- Venue ID - from query #1
- Name of venue
- Id - from query #2
- Venue rating
- Location city
- Location latitude
- Location longitude

Notes:

- I retained the ID from both queries to provide a way to visually ensure that the dataframe merge completed correctly
- Latitude and Longitude are retained for Folium mapping

(following are the first five results in the resultant dataframe)

Data Analysis Methodology

Using the data generated in Parts 1 and 2 of the project, I was able to use pandas to answer the questions raised and lead to various recommendations and conclusions.

Pandas grouping and sorting functions provided the tools needed to analyze the data. To provide perspective on where the highest-rated venues are located, Folium maps were generated to show several of the groupings.

NOTE: I generated a series of maps to show the location distribution of the highest-rated venues, but Cognitive Class Labs doesn't provide a capability for downloading or putting map data on the clipboard to be brought into a report or presentation.

Analysis Results

My method was to present a series of questions that I believe a typical west-sider would ask to help decide where to eat when the craving is for Mexican food.

Q. What is the overall average rating of Mexican restaurants in the Goodyear area?

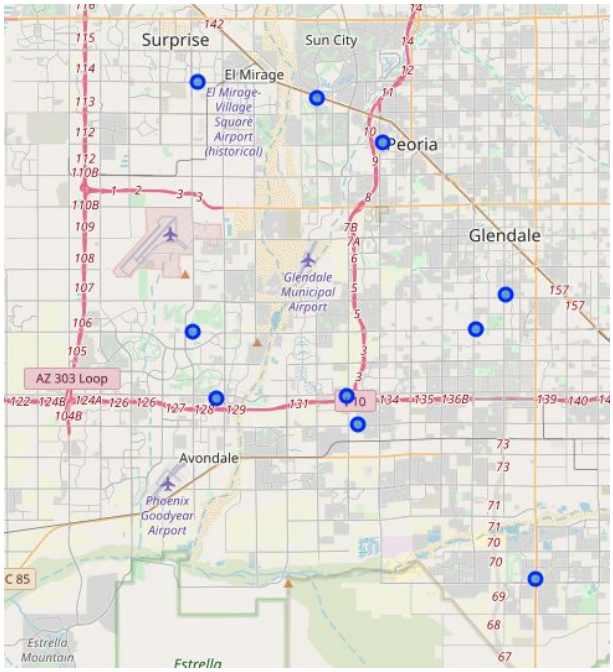
7.15

Q. Which West Valley city has the highest-rating Mexican restaurants on average?

City	Rating
Tolleson	7.9
Litchfield Park	7.5
Laveen	7.4
Goodyear	7.27
Glendale	7.24
Avondale	7.2
Peoria	6.975
Phoenix	6.975
Sun City	6.4
Surprise	6.3

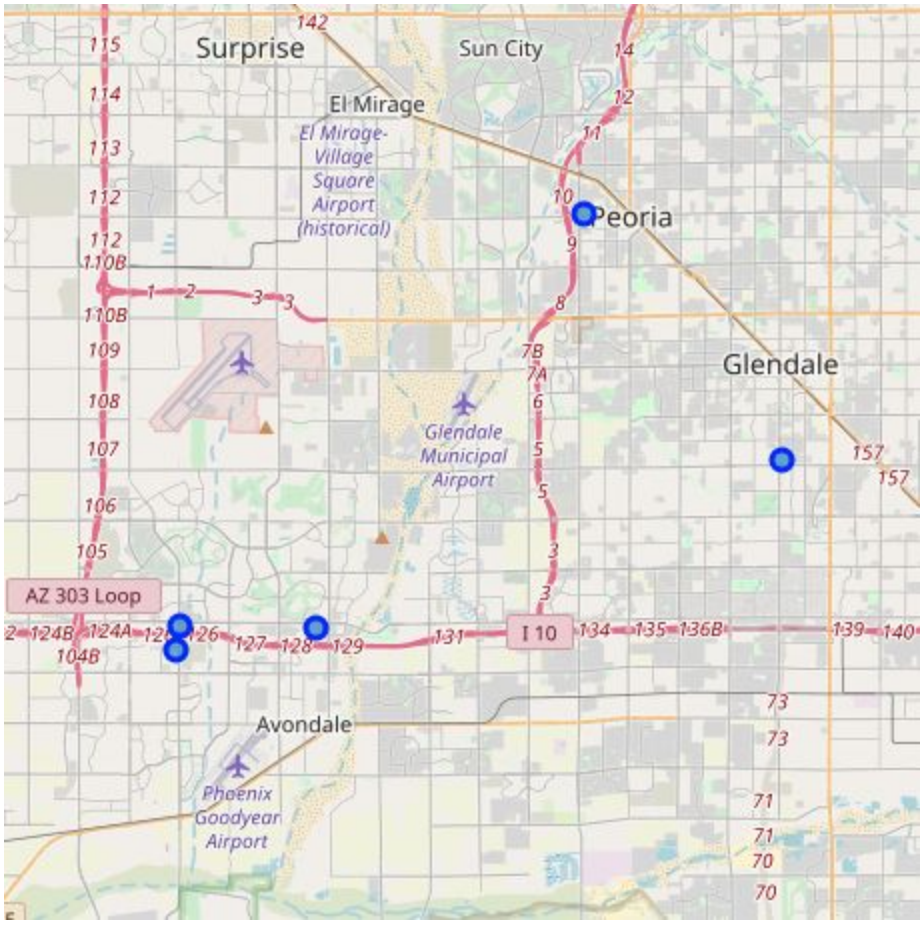
Q. What is the highest-rated Mexican restaurant in each city?

City	Restaurant	Rating
Avondale	Chipotle Mexican Grill	8
Glendale	Ta'Carbon	8.9
Goodyear	Manuel's Mexican Food	8.5
Laveen	Chipotle Mexican Grill	7.4
Litchfield Park	The Old Pueblo Cafe	7.5
Peoria	Carolina's Mexican Food	8.4
Phoenix	Popo's Fiesta del Sol	8.1
Sun City	Taco Bell	6.4
Surprise	Taco Bell	6.3
Tolleson	Filiberto's Mexican Food	7.9



Q. Irrespective of location, which are the top five highest-rated restaurants?

Restaurant	Rating	City
Ta'Carbon	8.9	Glendale
Manuel's Mexican Food	8.5	Goodyear
Carolina's Mexican Food	8.4	Peoria
Rubio's	8.4	Goodyear
Filiberto's Mexican Food	8.3	Goodyear



Recommendations and Conclusions

We can draw many conclusions and observations that lead to further questions:

- An overall 7.15 rating is reasonably high, and confirms the fact that Phoenix-area residents do indeed take their Mexican food seriously.
- The top three cities in overall ratings were Litchfield Park, Tolleson, and Laveen. However, what should be taken into account is that these are relatively small compared to their larger counterparts such as Goodyear, Glendale, and, of course, Phoenix. However, just because they are small, the high ratings show that residents are demanding high quality.
- As a west valley resident, I couldn't help but notice that there are missing venues. For example, there is a Senor Taco location in Litchfield Park. My assumption is that the Foursquare query engine is omitting results due to my license being the free option. I would hope that a paid subscription would result is a more complete result set.
- Another caveat with Foursquare data is that not all venues include a rating. That could skew results within a given city.
- When we drill down to look at the highest-rated venues, there is an interesting mix of national chains (Chipotle), local chains (Filiberto's), and one-or-two-location restaurants (Ta'Carbon). A certain snobbishness would discount a chain restaurant, but we see here that they fare quite well against the boutique venues.
- Given that Sun City and Surprise are both showing Taco Bell as their highest-rated restaurants, we may infer there isn't much of a presence of Mexican restaurants in those cities.
- Of the top five venues, we see that three of them are in Goodyear. That may suggest that choosing Goodyear as the center point for our analysis is a smart decision.
- It is good to know that except for the residents of Sun City and Surprise, all other west siders don't need to travel far for really good Mexican food.

Conclusion

For those of us that love Mexican food, this analysis confirms that there is no shortage of venues that will satisfy our cravings. One doesn't need to go far to enjoy high-quality cuisine that makes us all feel like speaking a little Espanol and wondering if the food in Mexico would be even better. But that is an analysis for another time.