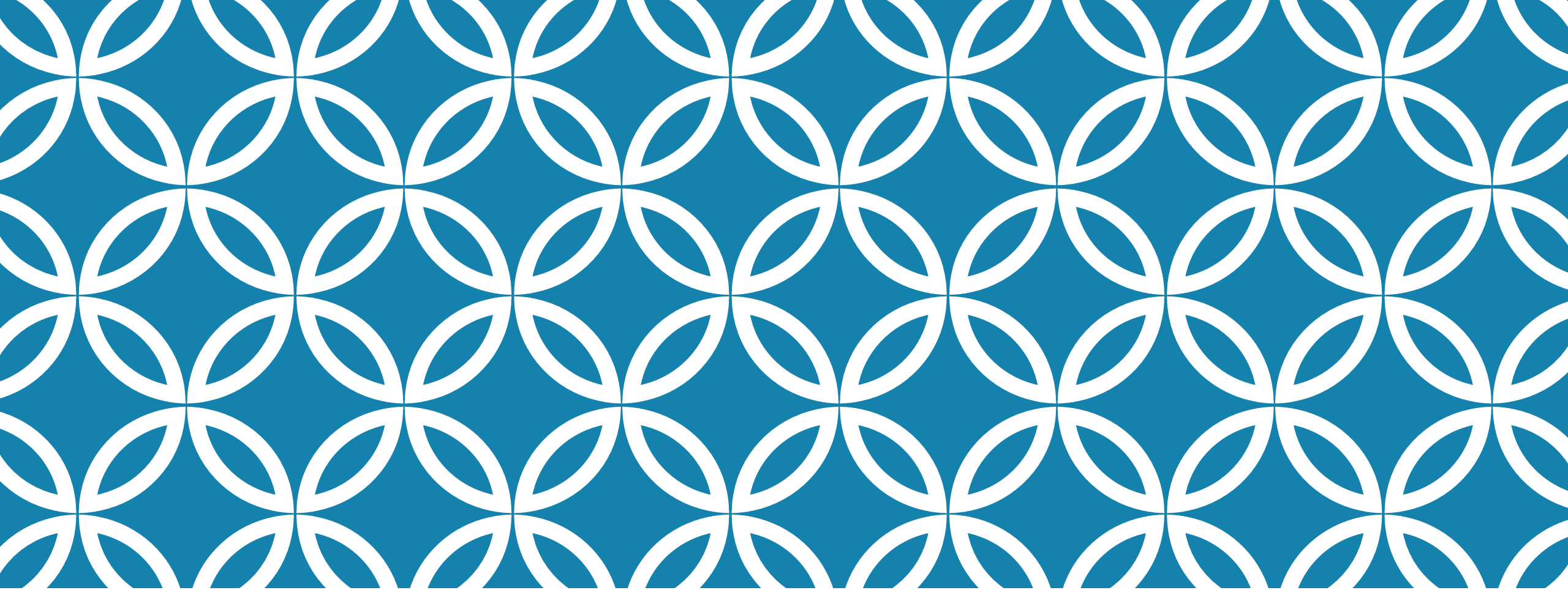


ICE CREAM TRUCK NEW BUSINESS EVALUATION

Capstone Project – Battle of the Neighborhoods

PROBLEM STATEMENT

A local investor is trying to decide if he should open an Ice Cream Truck business within the City of Phoenix. The business would focus on driving an Ice Cream Truck to various local parks to provide a convenient way for parents to purchase ice cream for their children.

The investor believes Phoenix is an ideal market for an Ice Cream Truck business due to its warm weather and growing population. However, before launching the business and making a capital investment, the investor wants to validate:

- That most local parks in Phoenix do not already have Ice Cream options nearby

and

- That Phoenix has a large population of children to consume the ice cream.

WE NEED DATA TO ANSWER THESE QUESTIONS

To answer #1 we will use two data sources:

A. Phoenix Park Data - Fortunately, Phoenix has publically available data about the location of all its parks available at https://phoenixopendata.com/dataset/parks/resource/4dedd0ad-ea1e-4000-aec4-e4feca296ea1

B. Foursquare API – Foursquare is a technology company that has a large amount of accurate location data. Foursquare has an API that provides access to this data that over 100,000 developers leverage to analyze location data. With Foursquare, we can evaluate what types of venues are nearby to a specific location.

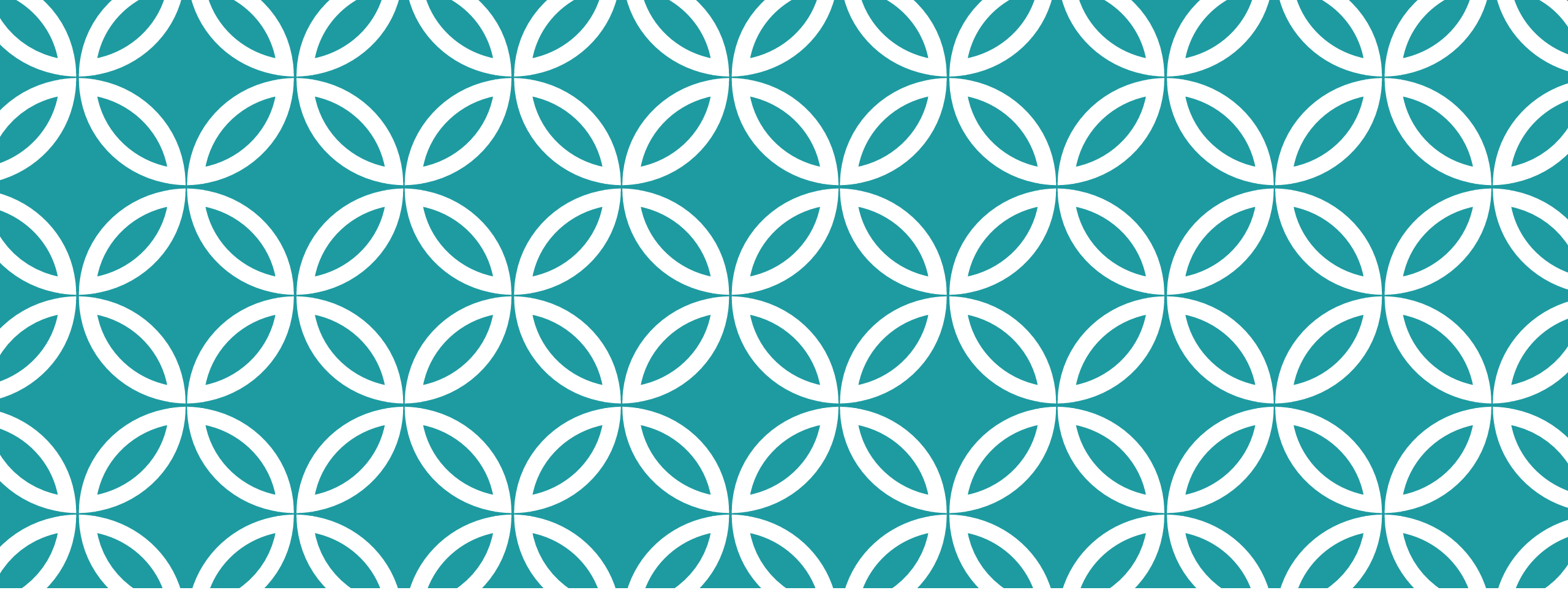
WE NEED DATA TO ANSWER THESE QUESTIONS

To answer #2 we will use two data sources:

A. Phoenix Household Demographics – Phoenix has publically available data about its household demographics available at https://www.phoenixopendata.com/dataset/33ab1c58-d8a9-46fc-b65e-50a62d8eb928/resource/29c9d1b5-3620-4622-909c-e3b2eab59a35/download/phoenix-az-household-type.csv.

This CSV file has a wealth of information about the number of Phoenix households and the type of households.

B. Phoenix Age Data - Phoenix has publically available data about its Age demographics available at https://www.phoenixopendata.com/dataset/fd0400b1-f62f-4d4e-9a88-253798891158/resource/6f460cd1-d0aa-4005-aadb-c371772cbd7b/download/phoenixazdemographic.csv. What we are interested in with this data is what % of the population is under 18. Unfortunately, this data does not give this specific answer, so additional data manipulation and calculations will be necessary to obtain this answer.



PART 1 CREATING A DATAFRAME OF PHOENIX PARKS

A DATAFRAME WAS SUCCESSFULLY CREATED, SHOWING 223 PHOENIX PARKS

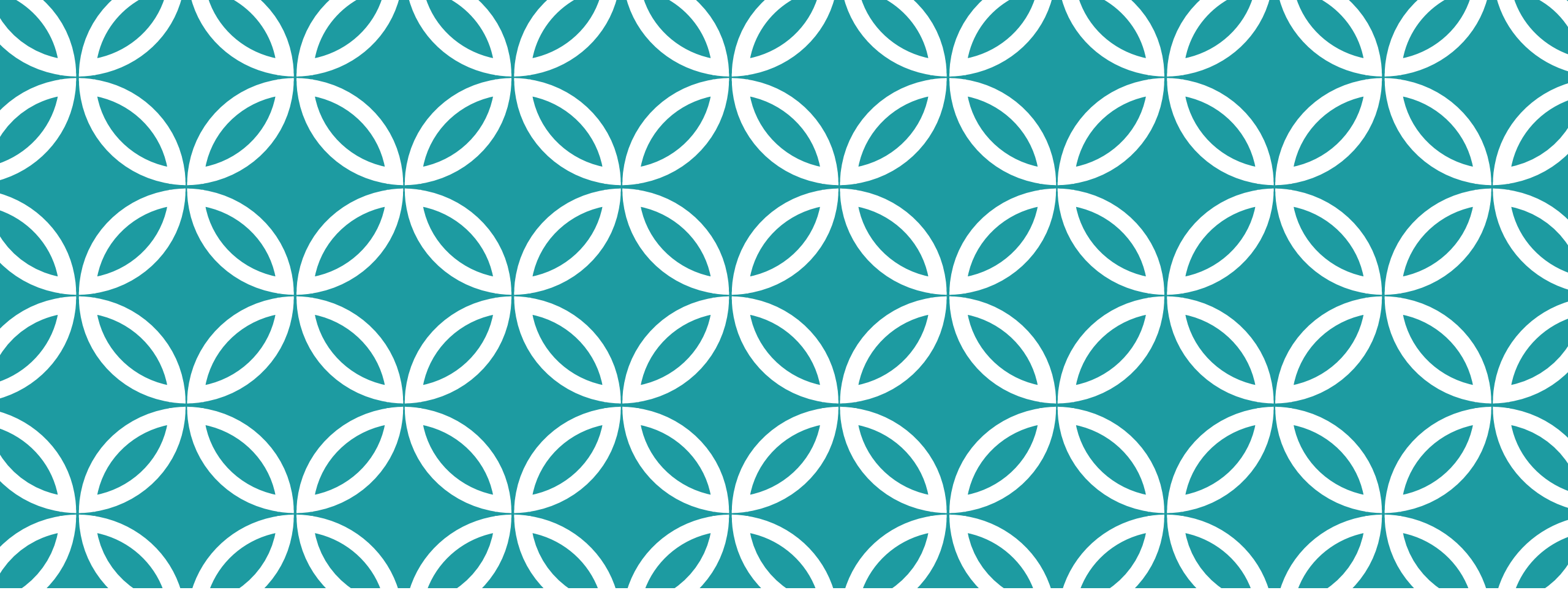
]:

	Longitude	Latitude	Park	Address	City	State	Zip
0	-112.049636	33.763867	Apache Wash Trailhead	1600 E SONORAN DESERT DR	PHOENIX	AZ	85085
1	-112.090026	33.476654	Encanto Park Clubhouse	2605 N 15TH AVE	PHOENIX	AZ	85007
2	-112.065841	33.449188	Thomas House	609 E ADAMS ST	PHOENIX	AZ	85004
3	-112.065662	33.449587	Teeter House	622 E ADAMS ST	PHOENIX	AZ	85004
4	-112.065416	33.449587	Silva House	628 E ADAMS ST	PHOENIX	AZ	85004

We now have a dataframe showing the Phoenix Park Data. Let's also validate all the data was imported

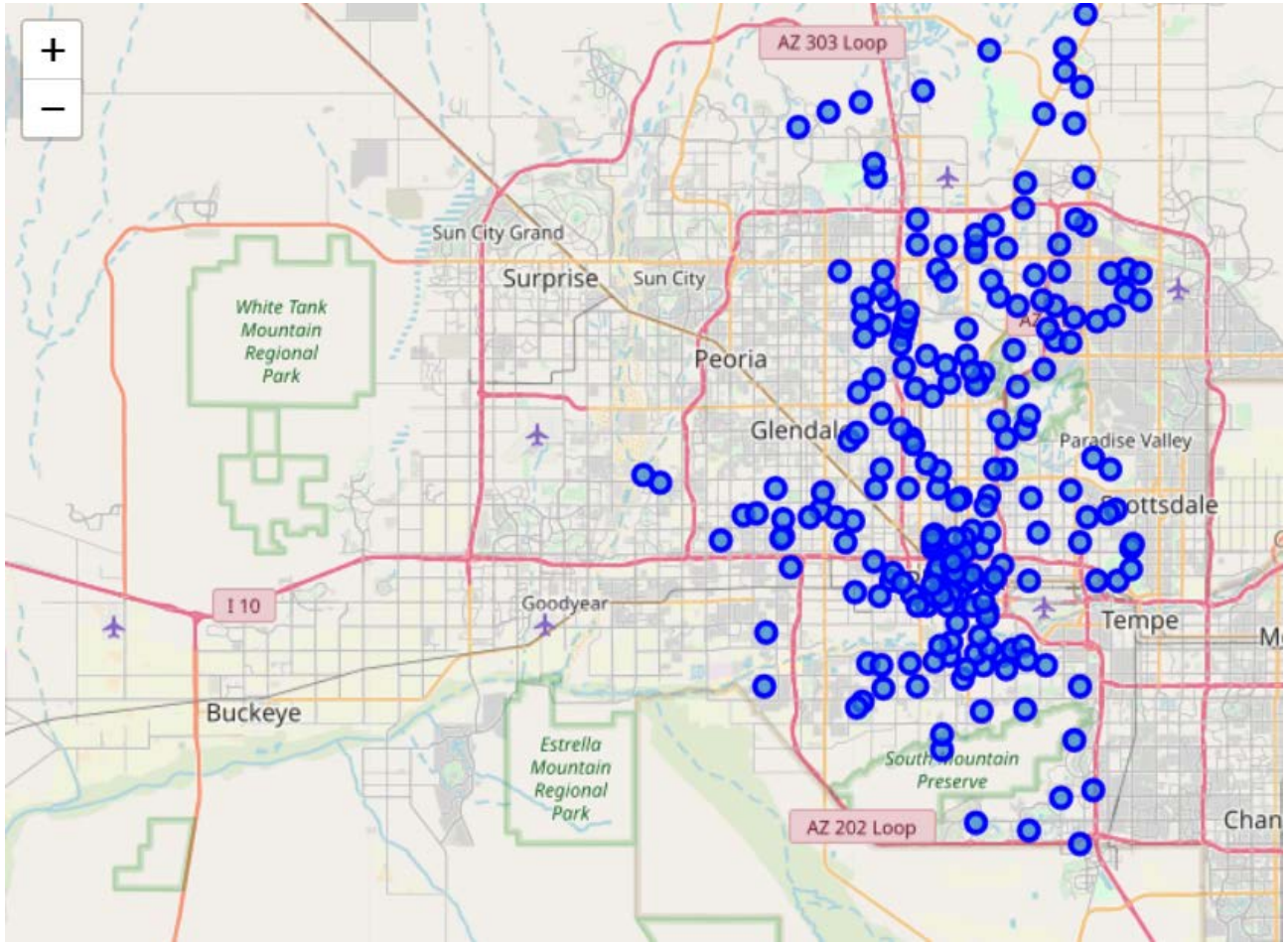
]:
```
Park_data.shape
```

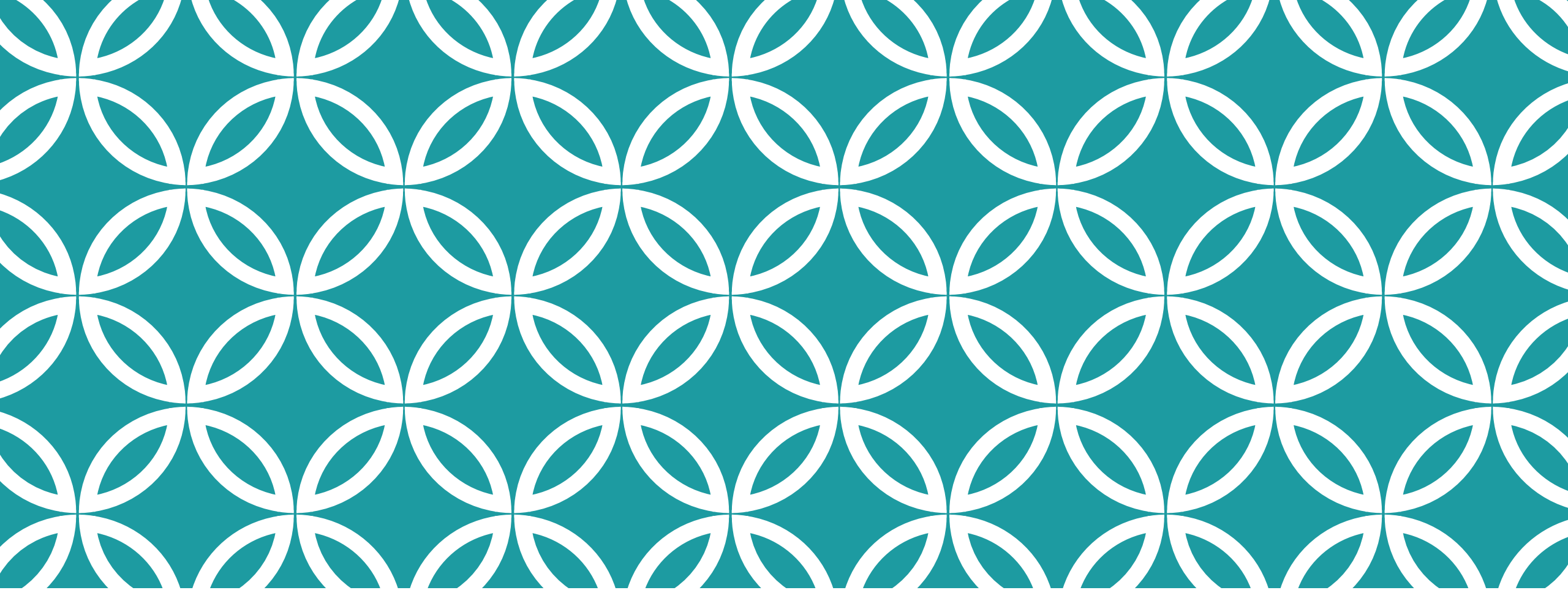
]:
```
(223, 7)
```



PART 2 VISUALIZATION OF PHOENIX PARKS

FOLIUM PROVIDED A BEAUTIFUL VISUALIZATION OF A MAP OF ARIZONA WITH PARKS LAYERED ON TOP OF IT.





PART 3 USING FOURSQUARE API TO SEGMENT, EXPLORE AND ANALYZE PARKS

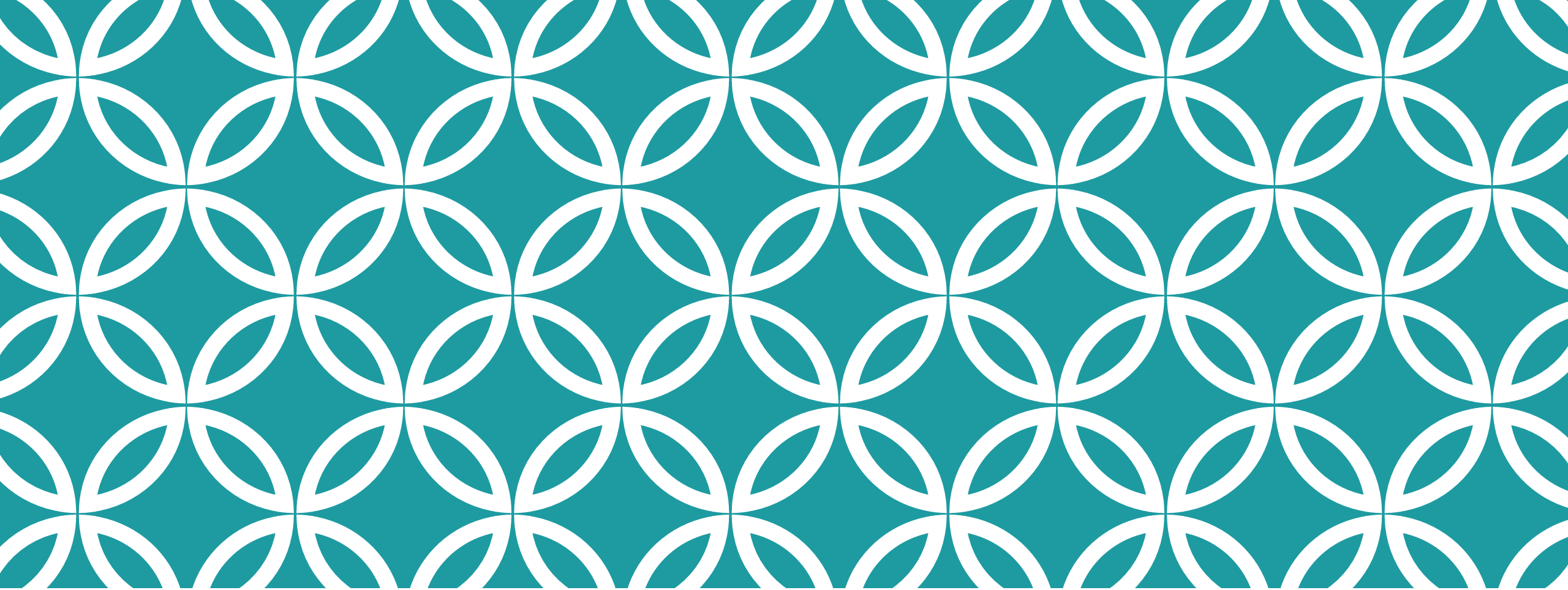
ON AVERAGE THE “ICE CREAM SHOP” AND “FROZEN YOGURT SHOP” ARE ONLY NEAR A PARK LESS THAN 1% OF THE TIME!

Now lets look at the Ice Cream Column

```
In [32]: park_grouped["Ice Cream Shop"].mean()

Out[32]: 0.008071748878923767

In [33]: park_grouped["Frozen Yogurt Shop"].mean()

Out[33]: 0.001345291479820628
```

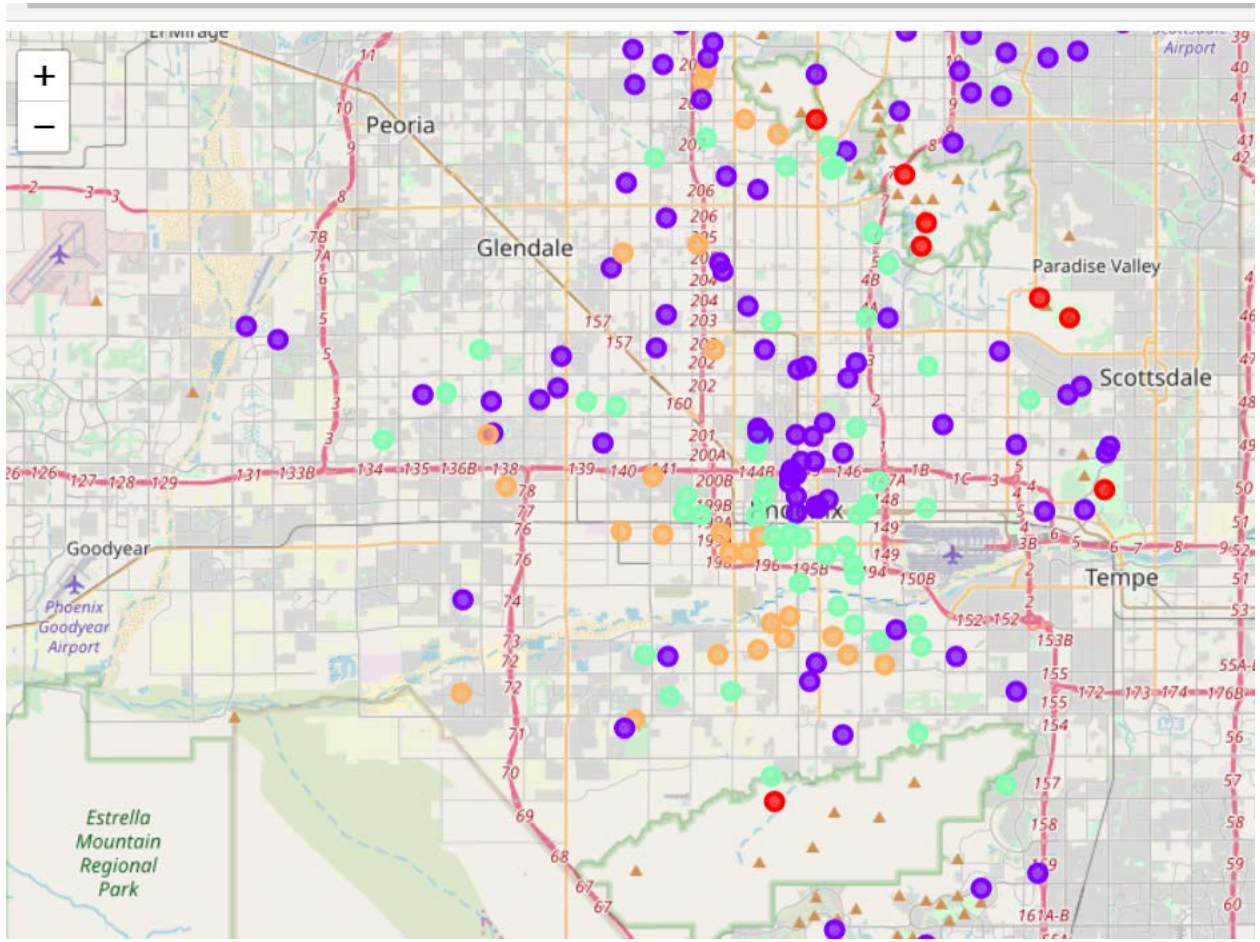
```
----10th Street Wash Park----
                venue  freq
0  Mexican Restaurant   0.2
1   Convenience Store   0.1
2           BBQ Joint   0.1
3             Brewery   0.1
4       Bowling Alley   0.1
```

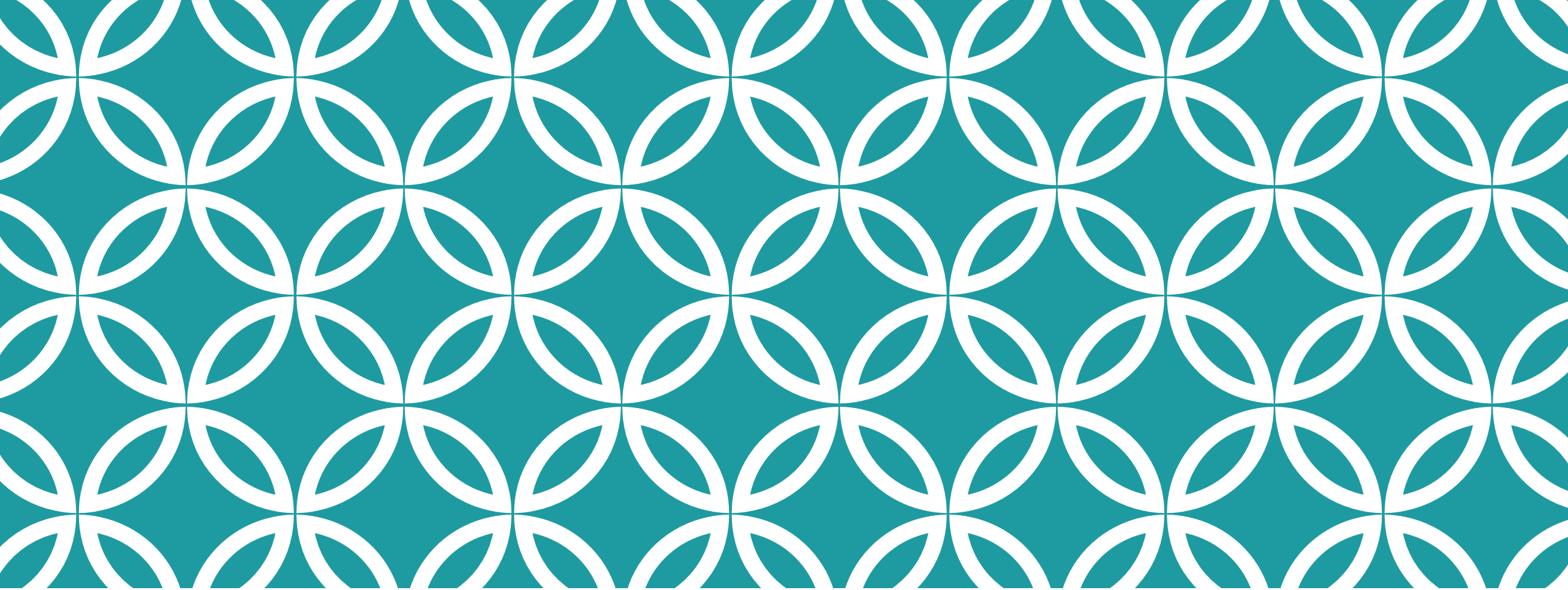
	Park	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue
0	10th Street Wash Park	Mexican Restaurant	Bowling Alley	BBQ Joint	Greek Restaurant	Gym / Fitness Center
1	Acacia Park	Electronics Store	Hardware Store	Pizza Place	Fast Food Restaurant	Sandwich Place
2	Acoma Park	Cosmetics Shop	Home Service	Salon / Barbershop	Fast Food Restaurant	Greek Restaurant
3	Adobe Mountain Park	Gym	Convenience Store	Trail	Cocktail Bar	Pharmacy
4	Alicia Park	Grocery Store	Sandwich Place	Convenience Store	Discount Store	Rental Car Location



PART 4 CLUSTER PARKS

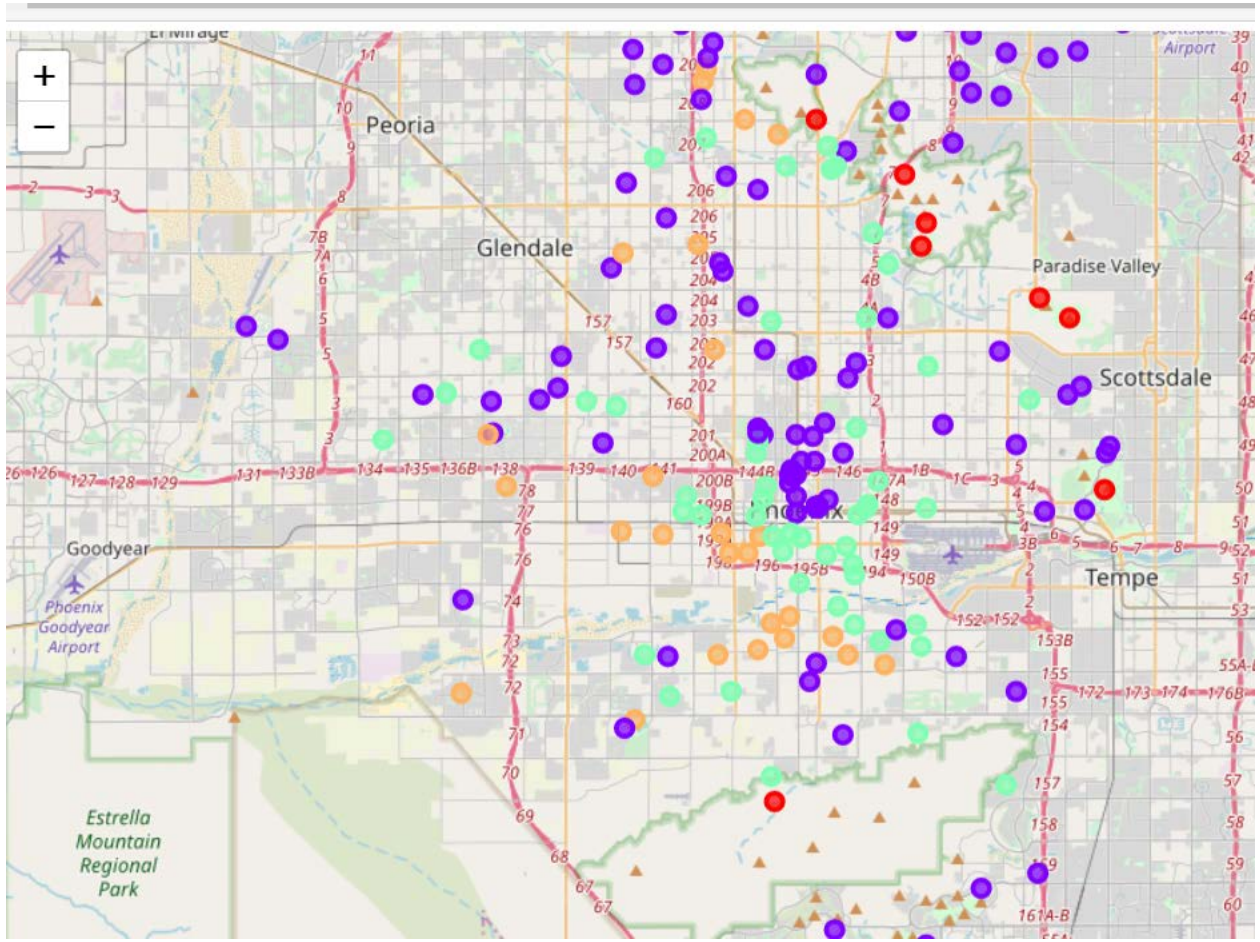
WE WERE SUCCESSFULLY ABLE TO CLUSTER THE PARKS INTO 5 KEY CLUSTERS AND VISUALIZE USING FOLIUM





PART 5 EXAMINE CLUSTERS

WE CAME UP WITH 5 CLUSTERS AND THE GOOD NEWS IS NO CLUSTERS WERE CENTERED AROUND ICE CREAM OR YOGURT!

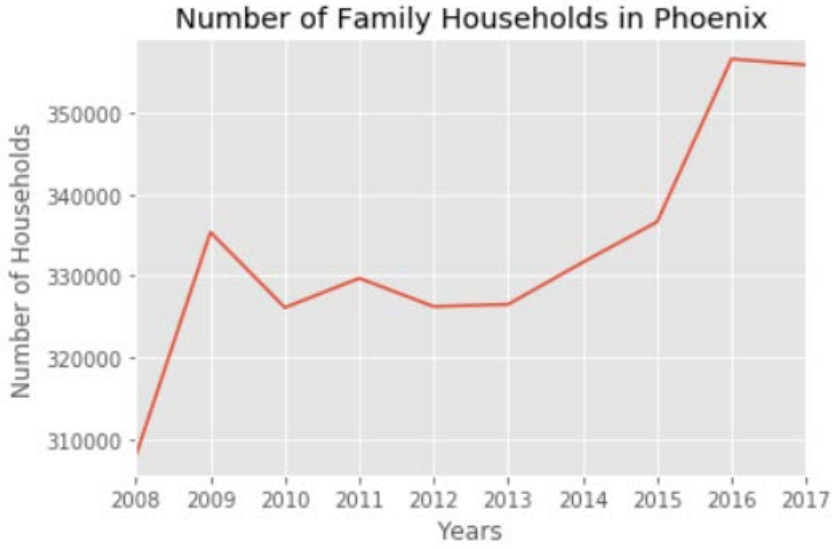


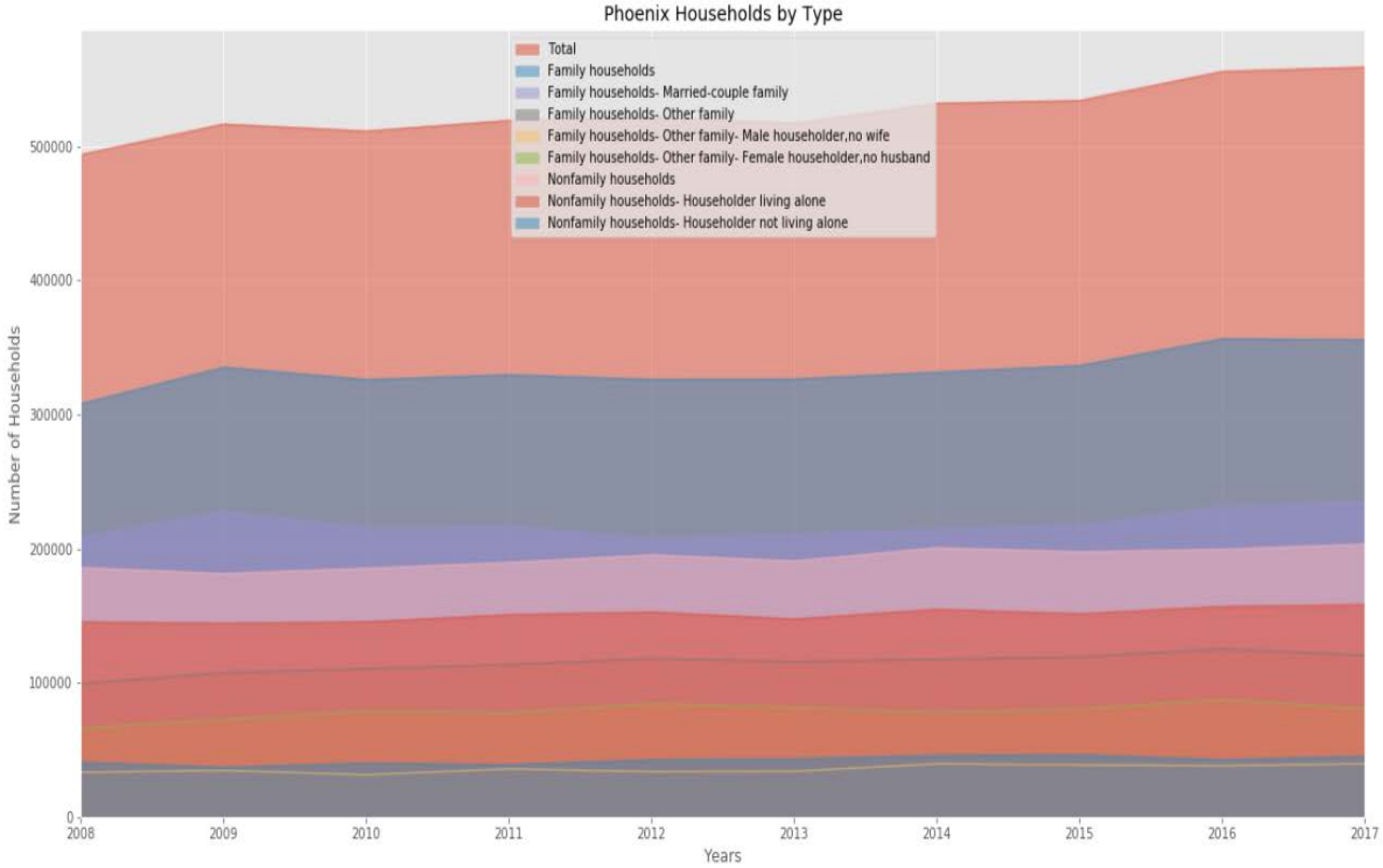
Clusters:

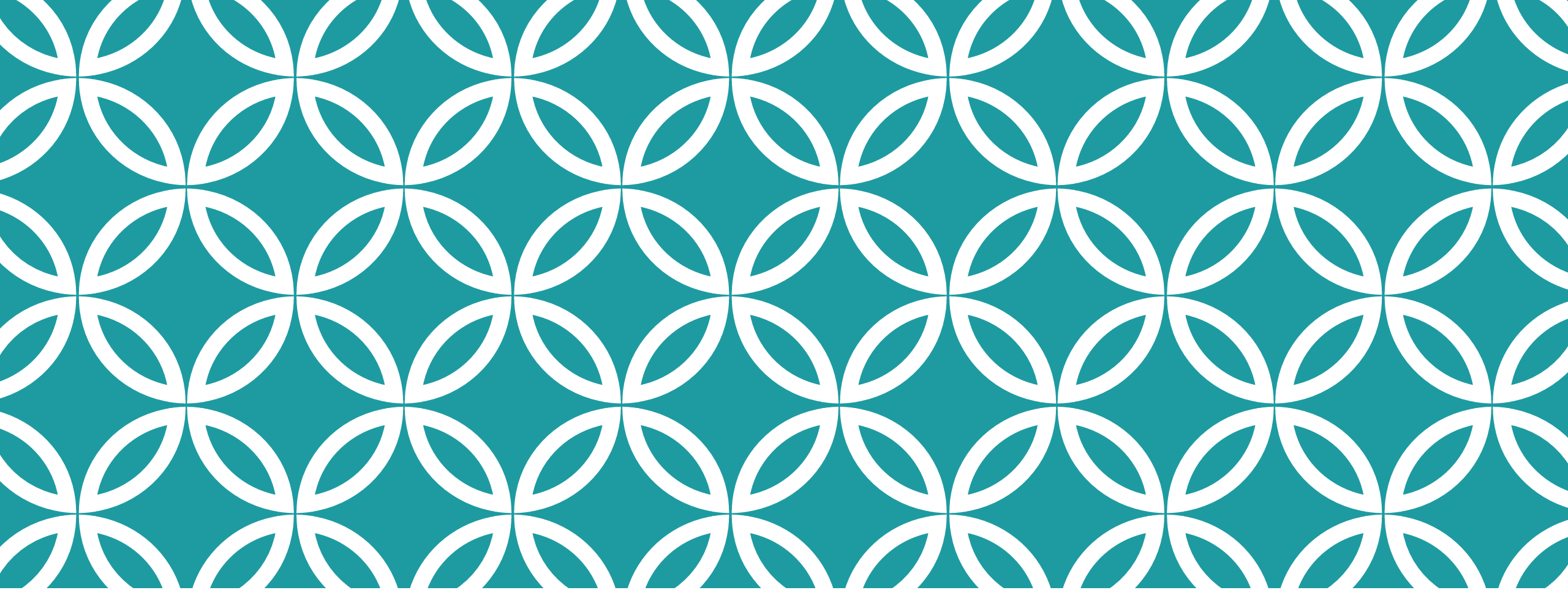
- Trails
- Hobbies
- Scenery
- Mexican Food
- Fast Food.

PART 6 EXAMINE PHOENIX HOUSEHOLD DEMOGRAPHICS

ABLE TO VISUALIZE PHOENIX HOUSEHOLD DEMOGRAPHIC DATA

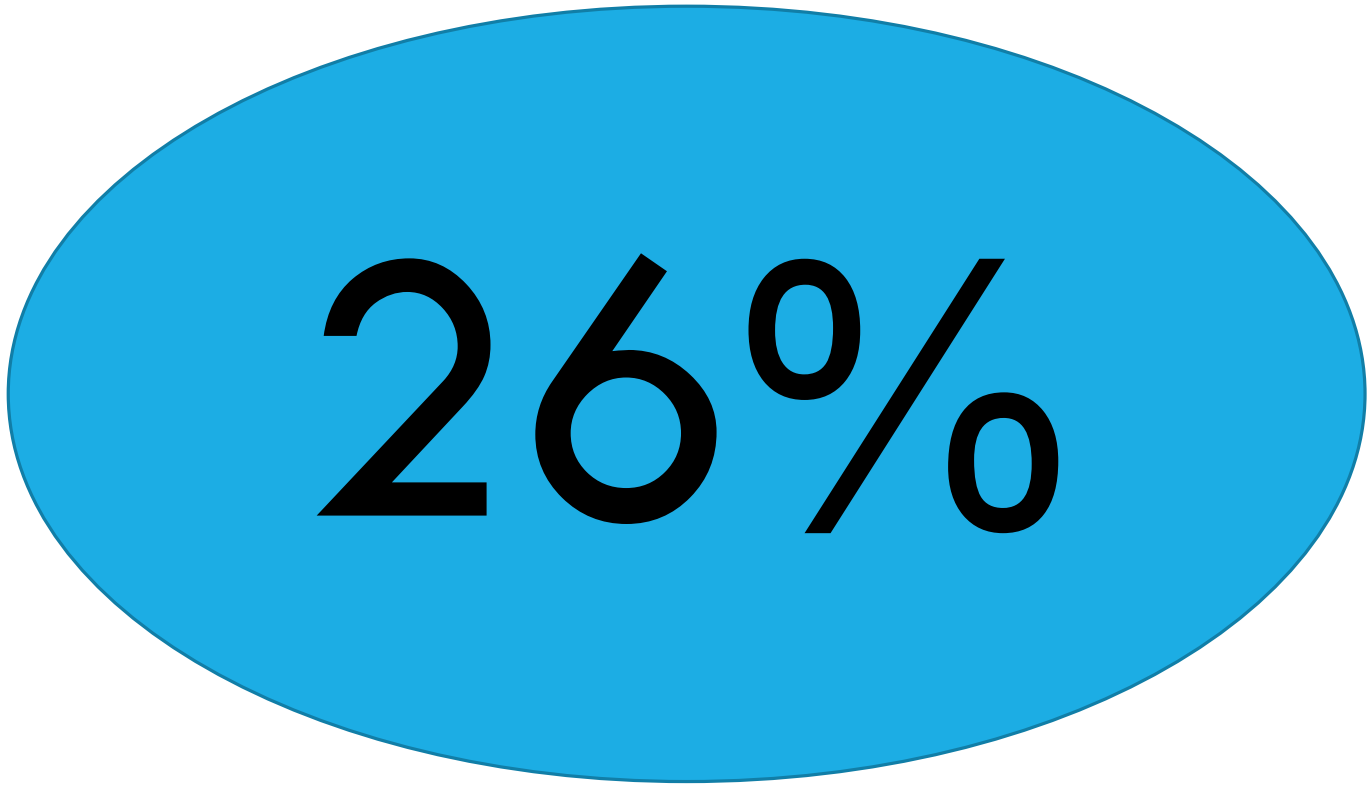






PART 7 EXAMINE PHOENIX AGE DEMOGRAPHICS

GOOD NEWS! WE WERE ABLE TO DETERMINE ~26% OF THE POPULATION IN PHOENIX IS UNDER 18!



PHOENIX WOULD BE A GOOD LOCATION TO START AN ICE CREAM TRUCK BUSINESS

Do local parks in Phoenix already have Ice Cream options nearby?
We were able to clearly show, using Phoenix Parks Data and the Foursquare API that no, parks in the Phoenix area DO NOT already have Ice Cream or Yogurt options nearby.

The investor's second question: **Does Phoenix have a large population of children to consume the ice cream?**
We were able to use Phoenix census data to show that the number of Households in Phoenix is growing steadily. We were also able to show that 26% of the population is under 18 and thus there will be many children wanting Ice Cream in Phoenix's hot weather!

THANK YOU!