



LINKING VENUES TO THE MEDIAN INCOMES OF A LOCATION

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Business Problem



Customers with more disposable income are more profitable for businesses to acquire but identifying them is a slow and costly process.



Direct mail sent to the right location is more cost effective than sending them everywhere. The focus increases response rates and possibility of acquiring a favourable customer.



Especially difficult to make decisions about regions with sparse data available.

Objectives



REDUCE COST OF PROFITABLE
PRODUCT PROMOTION



GEOGRAPHICAL MAPPING OF
POSSIBLE TARGET MARKETS



SPEED UP ANALYSIS OF A NEW
AREA'S POSSIBLE PROFITABILITY

Data Sources



1. Phoenix New Times Newspaper Website



2. LocationIQ



4. Foursquare API

3. "uszipcode" Python Library created by Sanhe



Data Preparation



THE LIST OF LOCATIONS WAS
WEB-SCRAPED FROM THE
PHOENIX NEW TIMES WEBSITE
USING BEAUTIFULSOUP AND
REQUESTS.



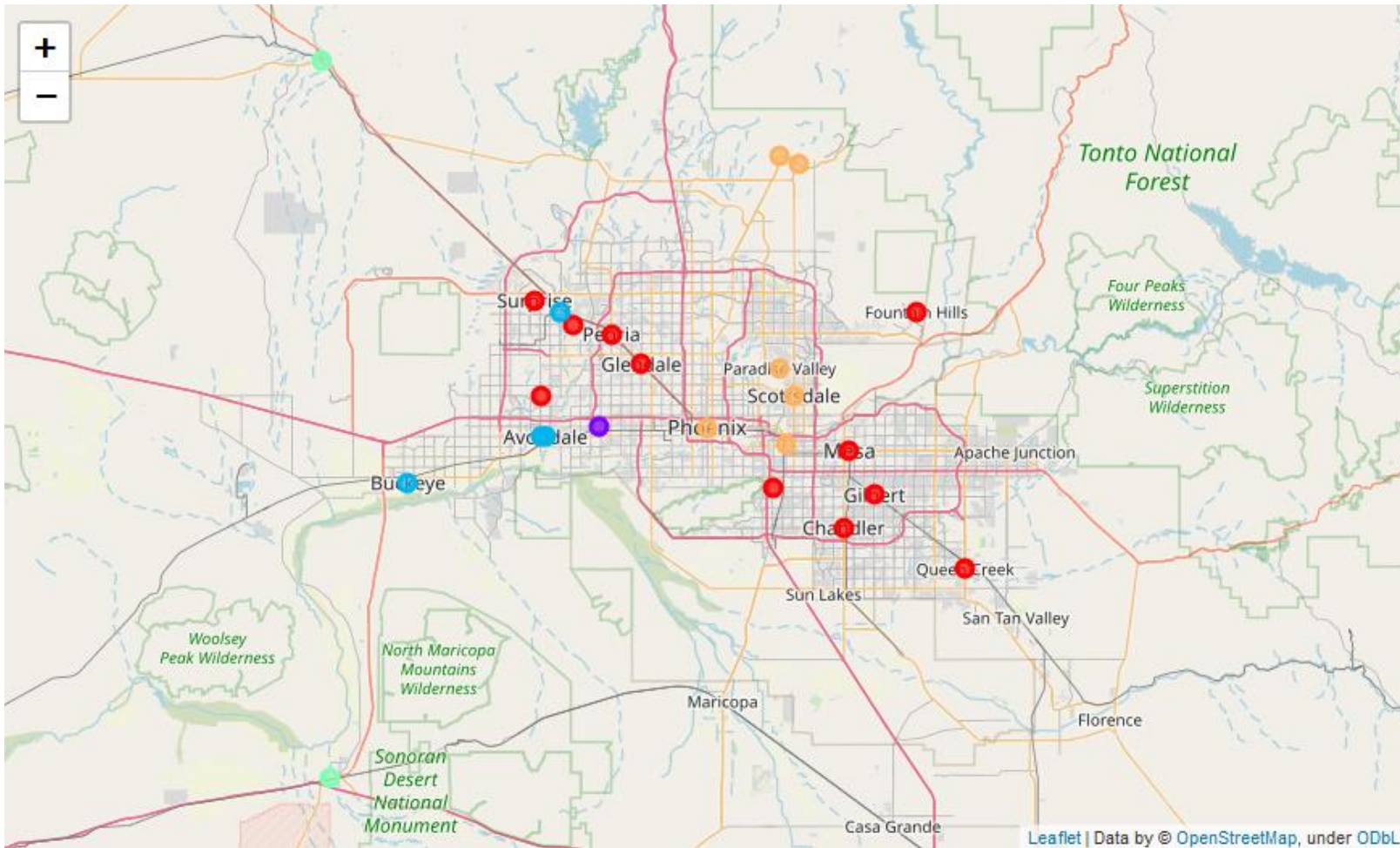
THE FORWARD GEOCODING
WAS DONE USING
GEOCODER AND
LOCATIONIQ.



THE USZIPCODE PYTHON
LIBRARY WAS USED TO OBTAIN
THE MEDIAN INCOME OF
EACH LOCATION.



THE FOURSQUARE API WAS
USED TO FIND THE VENUES
AND VENUE TYPES WITHIN A
GIVEN RADIUS OF A
LOCATION.



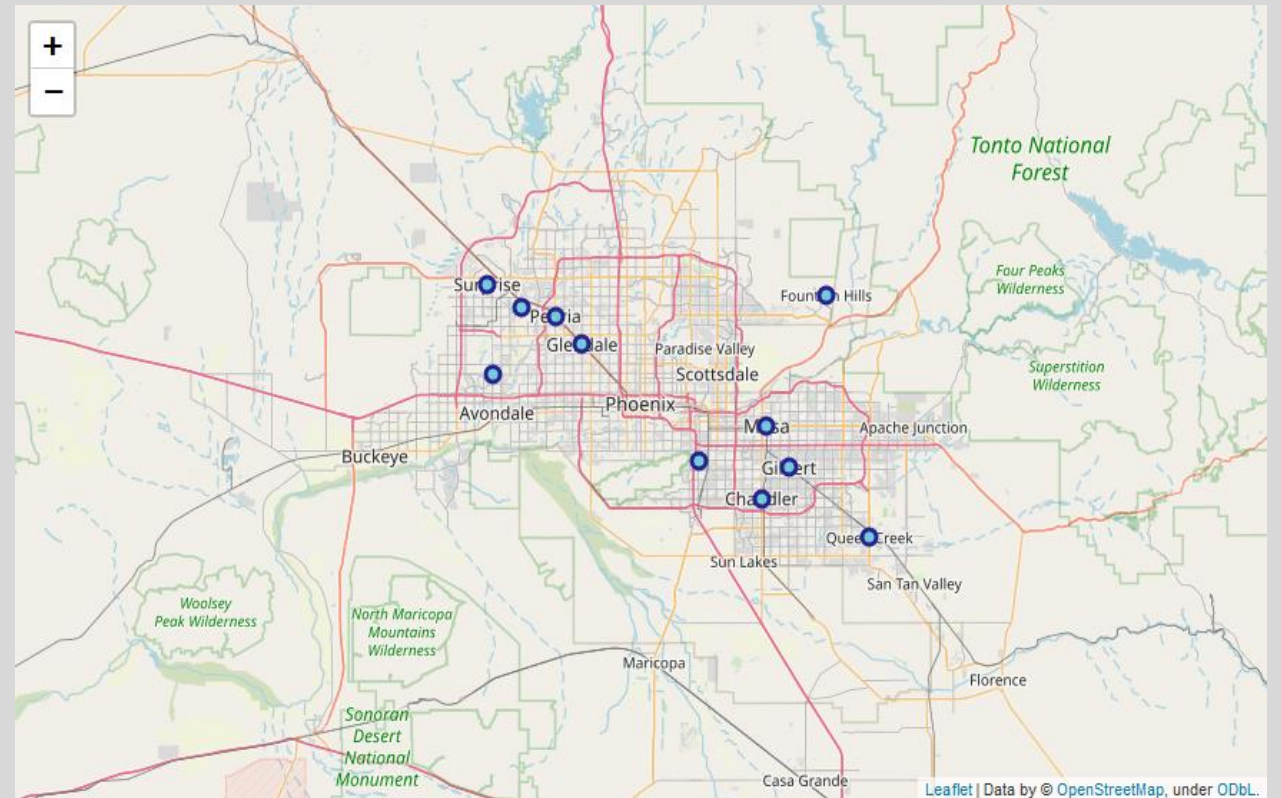
Methodology

K-Means clustering with five clusters.

Cluster 1

- Average Median Income: \$55,462.02

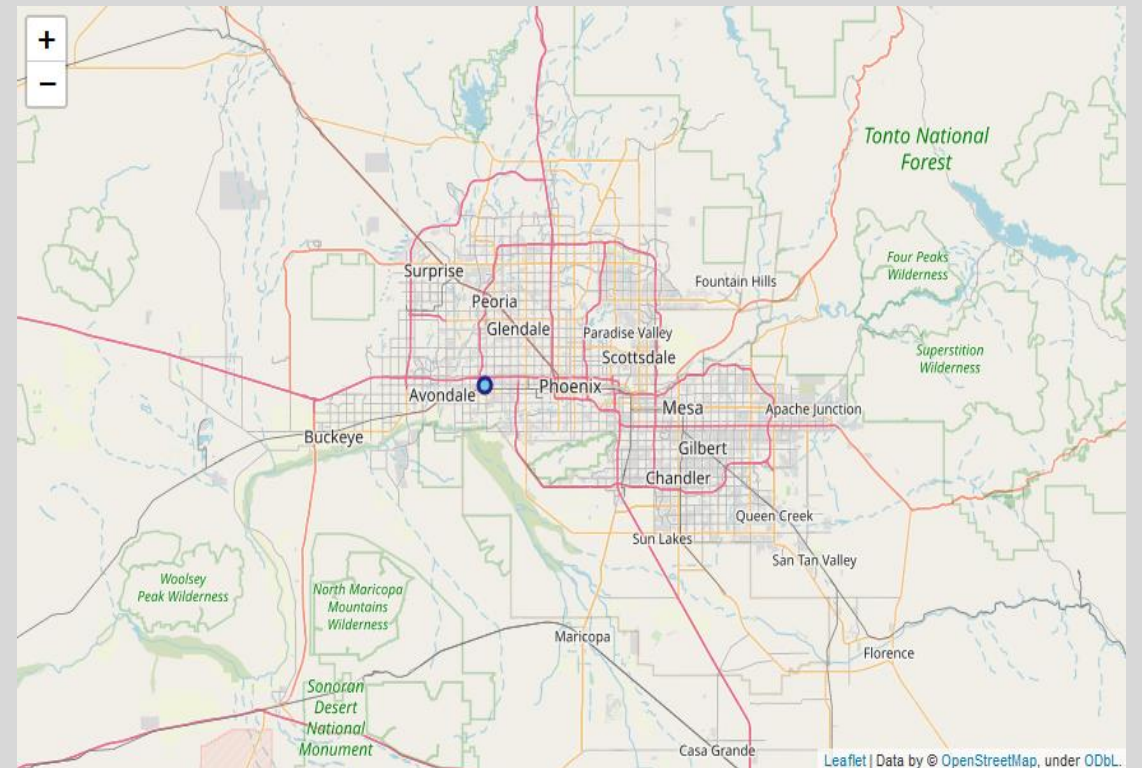
	Place	Latitude	Longitude	Median_Income	Cluster Labels	1st Most Common Venue	2nd Most Common Venue
0	Youngtown	33.593730	-112.303326	33884	0	Convenience Store	Fast Food Restaurant
4	Surprise	33.629227	-112.368019	70302	0	Sandwich Place	Fast Food Restaurant
5	Guadalupe	33.363125	-111.962533	53022	0	Fast Food Restaurant	Sandwich Place
9	Fountain Hills	33.611711	-111.717361	73608	0	Pizza Place	Italian Restaurant
10	Mesa	33.415112	-111.831479	36586	0	Mexican Restaurant	Convenience Store
12	Gilbert	33.352763	-111.789037	75365	0	Mexican Restaurant	Sandwich Place
13	Queen Creek	33.248386	-111.634158	73367	0	Mexican Restaurant	Pizza Place
16	Peoria	33.580612	-112.237294	45886	0	Fast Food Restaurant	Convenience Store
17	Litchfield Park	33.493380	-112.358124	64383	0	Coffee Shop	Grocery Store
18	Chandler	33.306160	-111.841250	56414	0	Mexican Restaurant	Convenience Store
20	Glendale	33.538686	-112.185994	27267	0	Convenience Store	Mexican Restaurant



Cluster 2

- Average Median Income: \$50,066.02

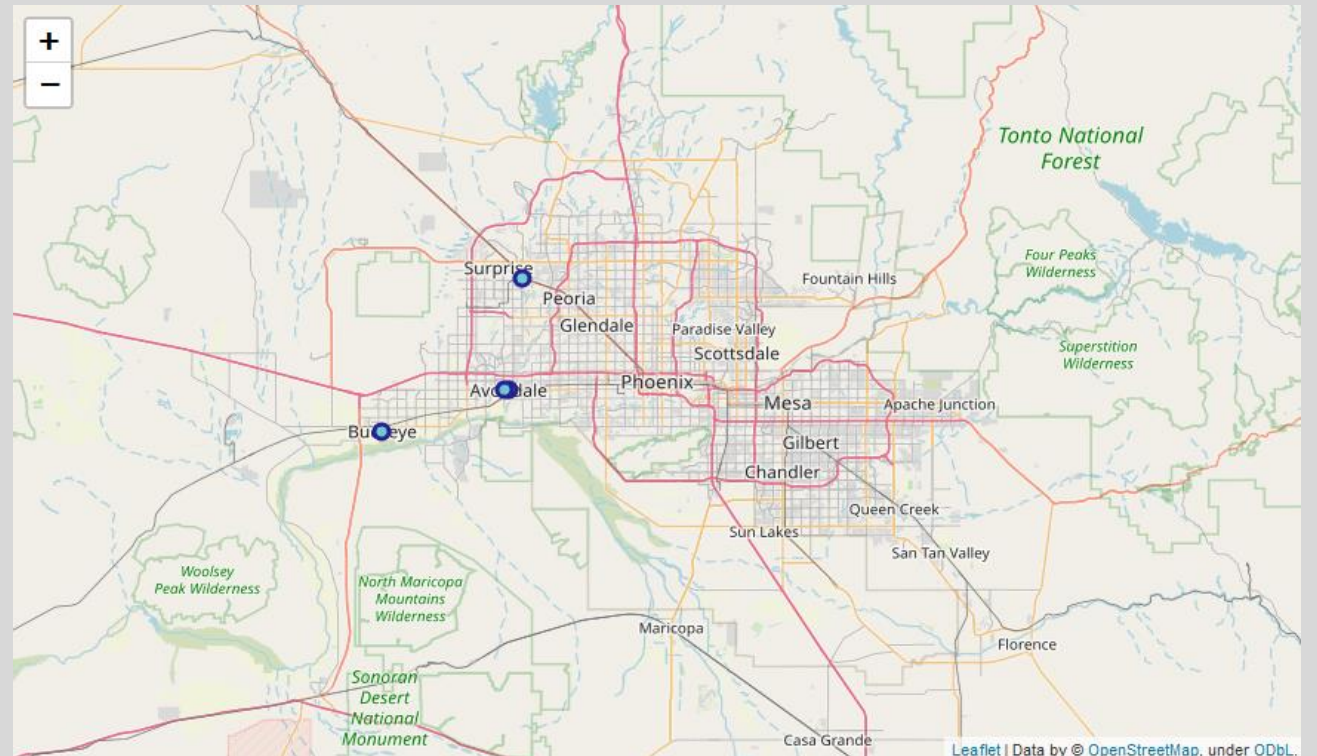
	Place	Latitude	Longitude	Median_Income	Cluster Labels	1st Most Common Venue	2nd Most Common Venue
3	Tolleson	33.45005	-112.259309	50066	1	Convenience Store	Mexican Restaurant



Cluster 3

- Average Median Income: \$51,348.02

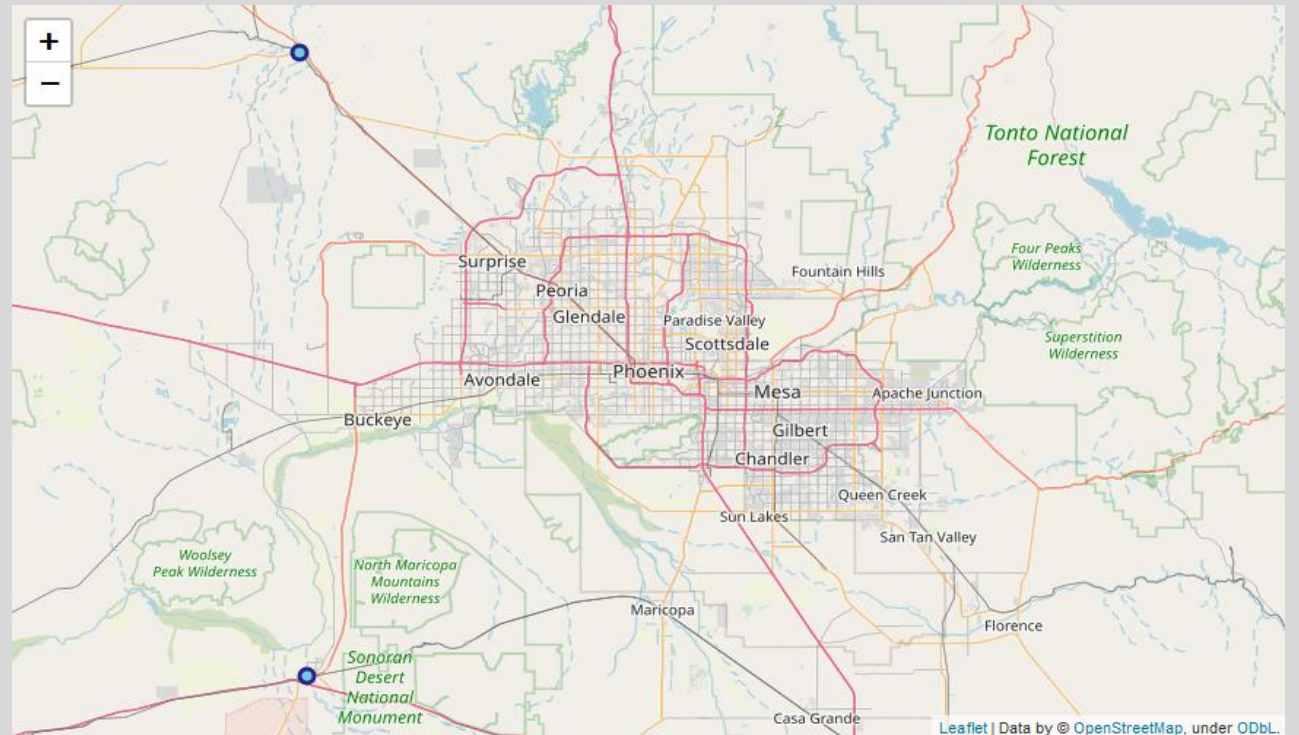
	Place	Latitude	Longitude	Median_Income	Cluster Labels	1st Most Common Venue	2nd Most Common Venue
2	El Mirage	33.613034	-112.324487	47237	2	Mexican Restaurant	Convenience Store
6	Avondale	33.435598	-112.349602	44658	2	Mexican Restaurant	Rental Car Location
7	Buckeye	33.370275	-112.583867	68839	2	Mexican Restaurant	Pizza Place
11	Goodyear	33.435367	-112.357601	44658	2	Mexican Restaurant	Fast Food Restaurant



Cluster 4

- Average Median Income: \$36,308.02

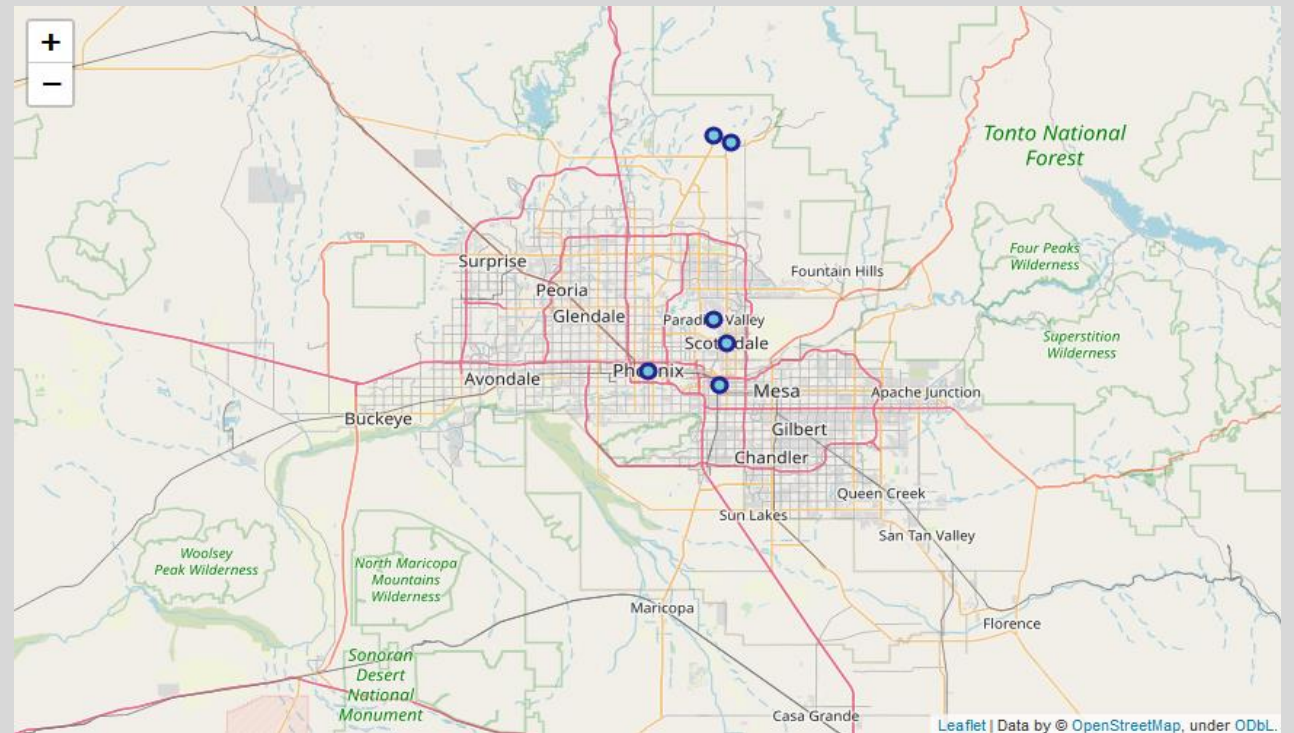
	Place	Latitude	Longitude	Median_Income	Cluster Labels	1st Most Common Venue	2nd Most Common Venue
1	Gila Bend	32.947827	-112.716824	30242	3	Fast Food Restaurant	Mexican Restaurant
15	Wickenburg	33.968096	-112.730135	42375	3	Fast Food Restaurant	Mexican Restaurant



Cluster 5

- Average Median Income: \$67,360.02

	Place	Latitude	Longitude	Median_Income	Cluster Labels	1st Most Common Venue	2nd Most Common Venue
8	Carefree	33.822261	-111.918203	100338	4	Coffee Shop	American Restaurant
14	Cave Creek	33.833333	-111.950833	88938	4	Coffee Shop	Mexican Restaurant
19	Paradise Valley	33.532429	-111.950512	109185	4	Spa	American Restaurant
21	Tempe	33.425506	-111.940012	30582	4	Coffee Shop	Breakfast Spot
22	Scottsdale	33.494219	-111.926018	49111	4	Coffee Shop	American Restaurant
23	Phoenix	33.448437	-112.074142	26008	4	Coffee Shop	American Restaurant



Results and Conclusions

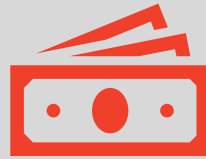
- Regions characterized by a prevalence of coffee shops and American restaurants are likely to be inhabited by people having more disposable income. Other dining establishments and Spas can also be found in this region.
- Regions characterized by a prevalence of fast food restaurants, Mexican restaurants, and convenience stores are more likely to have people with less disposable income.
- Promotions should be targeted at regions with more coffee shops and fewer fast food restaurants.
- A study of the businesses opening in a newly developed region of Phoenix can help determine whether it will be of interest to the business.

Future Direction



Expand Sample Size

Carry out the same analysis for more cities other than Phoenix.



Convert Factors Considered

Convert median incomes into region-specific percentiles to allow easy comparisons between cities.



Increase Factors Considered

Factor in the cost of living to determine the disposable income likely to be available in a region.