

Fast Food Restaurant Distribution Analysis based on Neighbourhood for North America

Dhruvi Pandya
07/07/2019

Problem Description

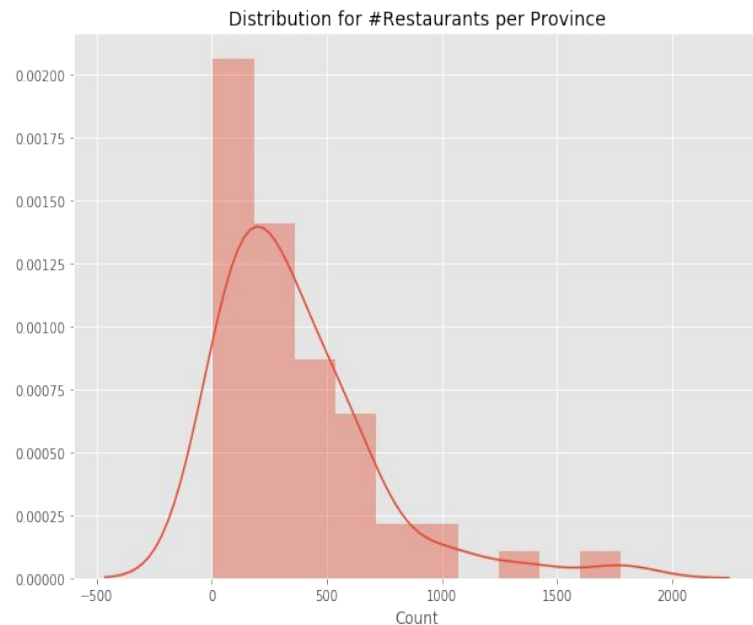
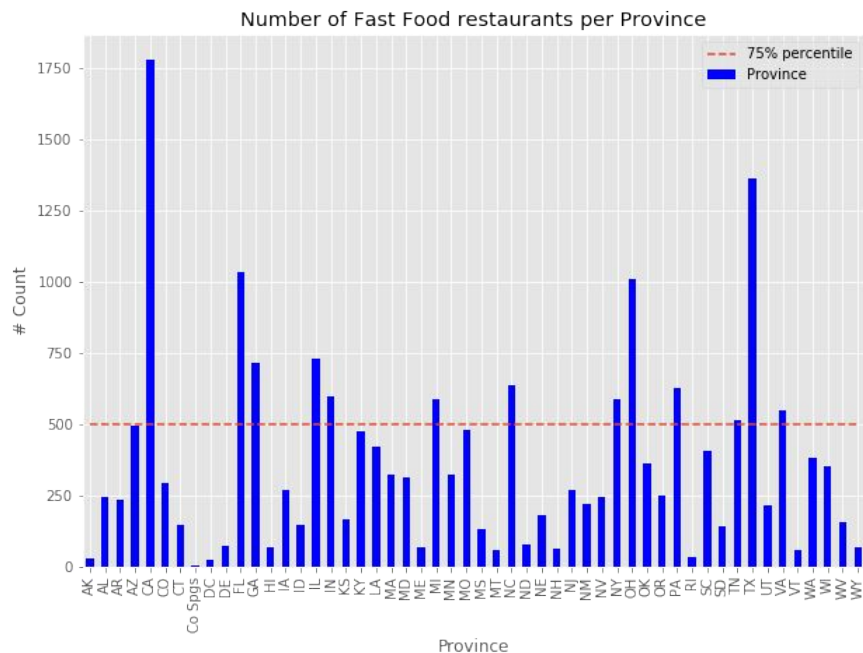
Analysis of successful fast food restaurant based on the neighbourhood they are located in helps in understanding the insights and relation present between the target consumers and the success of the restaurant.

Interest

- Since this analysis is a general analysis between the target audience and the location, it remains in the interest of many industries like hotel industry, real estate which looks out for prime locations meaning what they are near to and what others attractions they are nearby.
- Example is the rooms having a view are sold more as compared to other rooms in a hotel.
- Other such example is nowadays movie theatre are located in malls in contrast to the stand alone buildings in past.

Exploratory Data Analysis

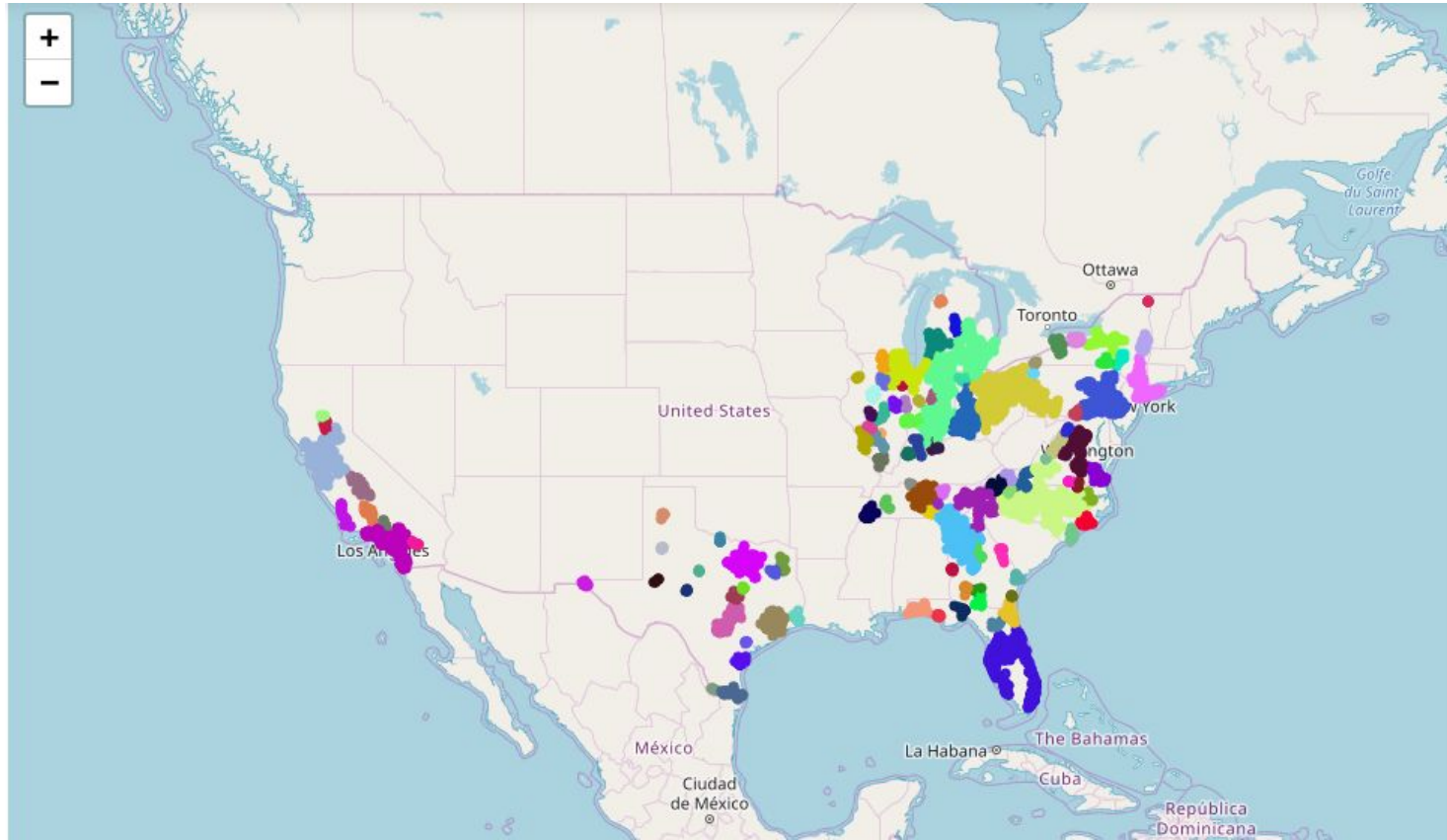
- Number of Restaurant per province



- 60% of the provinces have restaurant count between 200-500.
- About 25% of total restaurant distribution is concentrated in a few provinces.
- Refer figure (i), the dotted line shows the 75 percentile of the restaurant distribution i.e. all the markers below the line constituent the 75% of distribution.
- 13 Province forms the 25% of the distribution. These 13 province are my point of interest.

Sr No.	province	restaurants_in_province
1	CA	1778
2	TX	1364
3	FL	1033
4	OH	1009
5	IL	728
6	GA	715
7	NC	635
8	PA	628
9	IN	599
10	NY	588
11	MI	586
12	VA	549
13	TN	515

Geographical Distribution



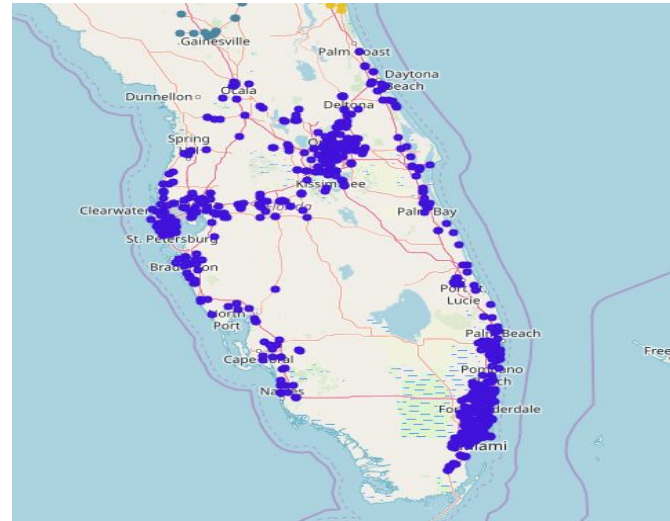
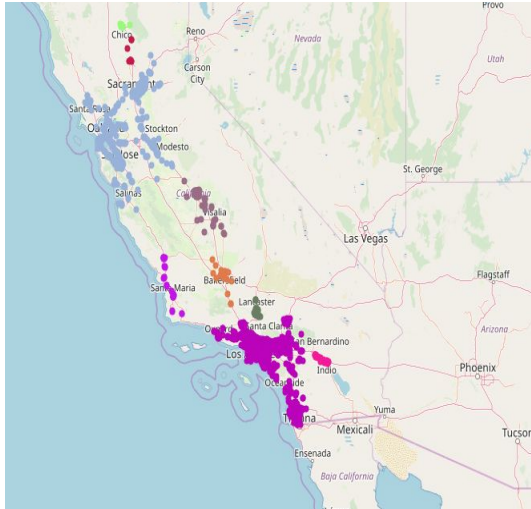
- The location of these 13 province where apart from California and Texas all other provinces are clustered together definitely has some insight.
- With the demographics of these provinces it could be anything from the number of tourist places to the number of universities and malls it has.
- Or it could be related to the population of the province or the number of highways in the province as it is a common known fact that fast food restaurants are mostly situated around the highways.
- To understand the effect of these demographics, following variables were introduced.

area_km2	Area per sq km of the province
population	Population of the province
province	Code of the province
is_tourist	Is Province in top 10 tourist places in USA ?
restaurants_in_province	Total number of fast food restaurants in province
rest_per_km2	Total restaurants per sq km
rest_per_1000people	Total restaurants per 1000 people

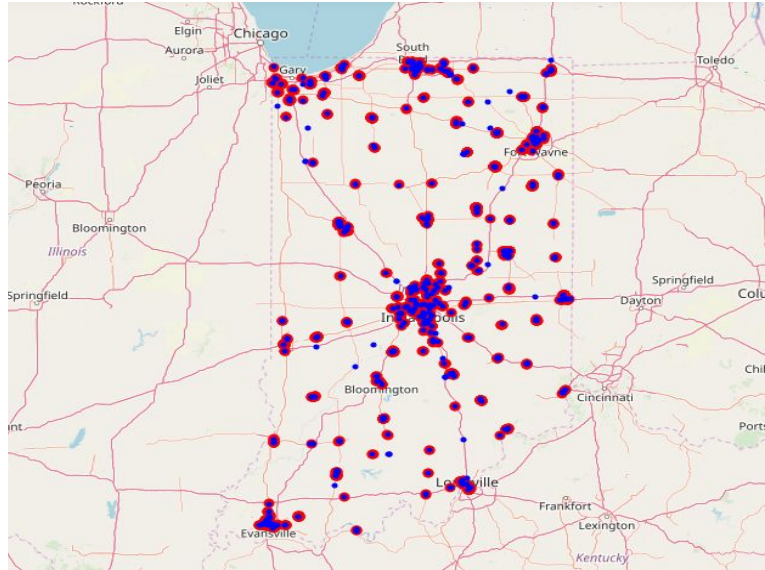
Correlation between the Demographic Variables



- Observing the graph of variable `restaurants_in_province` to `area_km2` and populations, we can safely say the number of restaurants increase with increase in the population or the land area.
- While the graph of `restaurants_per_province` to `rest_per_km2` and `rest_per_1000_people` tells us that even though the number of restaurants in the province increase, the franchise wouldn't want to over cater the population by cluttering many restaurant together.
- The tourist state factor might not be very much visible in the pairwise plot; but it is very evident in the geographical distribution figure. Following are the geographical distributions for some province highlighting the tourism factor. California and Florida respectively:

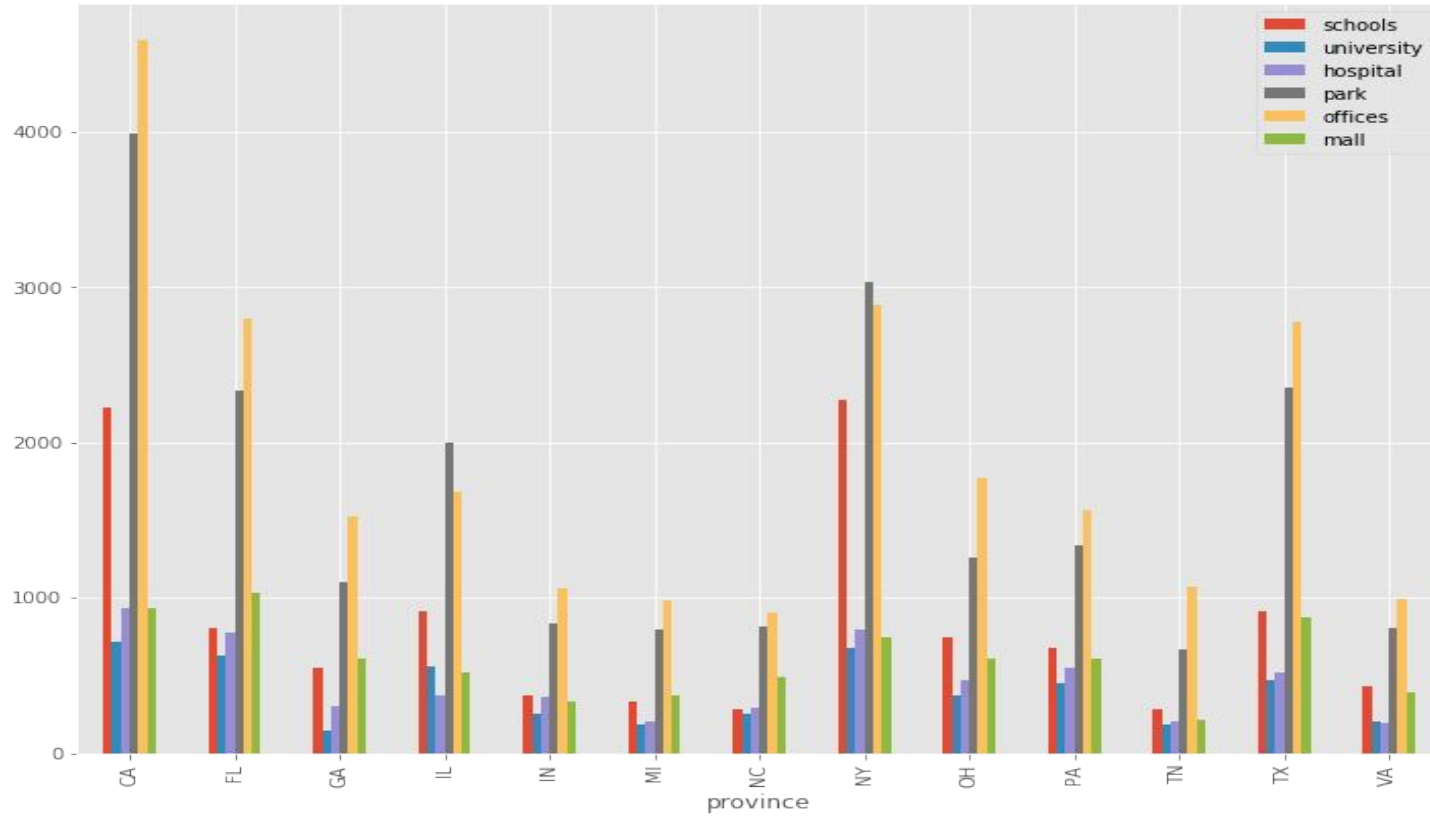


- California and Florida both were major tourist attraction provinces. Let us consider Indiana, while it falls in top 25% province, it is comparatively smaller and less populated province.



- But as can be seen in the map, there are clusters of restaurant around some road of networks. This could be some mall, offices hub, schools, parks or any of the places attracting the crowd. Following figure shows the location of the restaurants in Indiana and some major public places like schools, universities, office hubs, malls, parks etc. The Red markers are the public spaces and the blue markers are the restaurants. Almost 96% of the locations overlap.

- Below is the chart showing the count of the crowded/ public places surrounding the restaurants.



Conclusion

In this study, I have analysed how existing successful fast food restaurants have taken the hidden neighbourhood data in consideration for selecting a profitable location for their outlets. I have taken into consideration the points which I highlighted in the beginning of the study and cross verified with the actual distribution. This type of study can be used to make a classification of a potential profitable location for a new restaurant. That type of classification problem falls under the umbrella of positive and unsupervised classification as we do not have many negative/ failed cases of restaurant in the data. Also, this type of analysis helps in providing new directions for the marketing and service providing to the restaurant and the hotel industry.

Future Direction

- In this Case Study, there are many possibilities of further analysis, like classifying potential profitable locations.
- Furthermore, one can do analysis based on the individual franchise like McDonalds, Subway etc to understand how these giants select their locations for restaurants and what are the scenarios which lead to failed cases.