

Investment Research for Business Establishment of Restaurant

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A. Introduction

A.1. Description & Discussion of the Background

Izmir, Turkey's most populous province and is the third city. Its population is 4,394,694 as of 2020. This population; He lives in 30 districts and 1,297 neighborhoods of these districts. [6] The population density throughout the province is 369.5. It is geographically located in the west of Turkey and the entire province is located in the Aegean Region.

One of our customers would like to decide where is the best place for opening burger or pizza restaurant in the İzmir/Konak. And which one is the best option for profitability. In addition, our customer want to set up their restaurant very close to another ones in order to increase competition in Konak. Konak a town which is located in Izmir / Turkey.

In order to solve these problem; firstly I will create data frame for pizza restaurants and for burger restaurants separately. After that I am going to search for a specific venue category which is "burger" and "pizza". I am planning to request all pizza restaurant and all burger restaurant from foursquare in Konak. And finally I will visualize the burger and pizza restaurants that are near to "Konak".

When we consider all these problems, we will create a map and categories chart where the pizza and burger restaurant are placed on Izmir.

A.2. Data Description

A.2.1 Data Sources

Most of information such as latitude, longitude, categories, name of restaurant can be found foursquare API. In following sections we will be used Foursquare API to get the most common venues of Izmir.

A.2.2. Data Cleaning

In order to clean data steps are going to following as sown below;

- Identify and handle missing values
- Data formatting
- Data normalization
- Data filtering

B. Methodology

As a database, I used GitHub repository in my study. My master data which has the main components *name*, *categories*, *Latitude* and *Longitude* information of the city.

	name	categories	lat	Ing
0	Pizza Villa	Pizza Place	38.418143	27.130593
1	Palmiye Döner & Pizza	Pizza Place	38.422516	27.132295
2	Tadım Pizza	Pizza Place	38.420868	27.130735
3	Piu Pizza	Pizza Place	38.420827	27.130185
4	Luciano Pizza & Döner	Café	38.420832	27.130486

Fig.1 Data Frame of Pizza Restaurants

	name	categories	lat	Ing
0	Burger King	Fast Food Restaurant	38.416406	27.128369
1	Burger King	Fast Food Restaurant	38.422126	27.129206
2	Burger No 7	Burger Joint	38.432755	27.142415
3	Burger King	Fast Food Restaurant	38.403354	27.128846
4	Burger King	Fast Food Restaurant	38.428603	27.136513

Fig.2 Data Frame of Burger Restaurants

I used python folium library to visualize geographic details of Izmir/Konak and its burger and pizza restaurants and I created a map of Izmir. I used latitude and longitude values to get the visual as below:

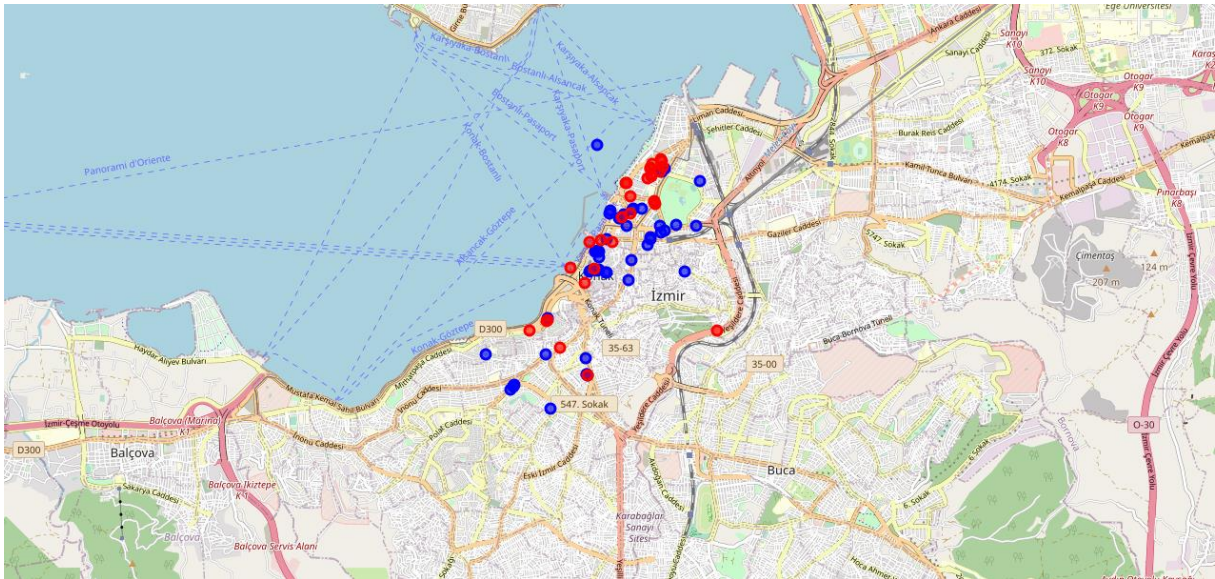


Fig.3 Location of Burger Restaurant in "red" and Pizza Restaurant in "blue"

It is seen that most of burger restaurant located to west side of Konak and most of pizza restaurant is located middle side of Konak map.

In order to see what kind of restaurant that we have and what is their categories, we will be using bar chart.

Pizza Place	37
Fast Food Restaurant	5
Café	2
Italian Restaurant	1
Breakfast Spot	1
Moroccan Restaurant	1
Pide Place	1
Hotel	1

Name: categories, dtype: int64

Burger Joint	17
Fast Food Restaurant	6
Ice Cream Shop	2
Café	1
Coffee Shop	1
Steakhouse	1
Fried Chicken Joint	1
Chinese Restaurant	1

Name: categories, dtype: int64

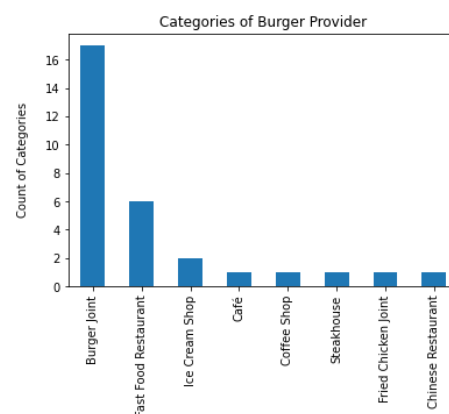
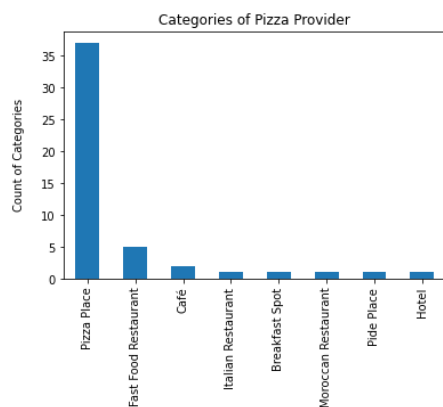


Fig.4 Categorical Bar Chart of Pizza and Burger Restaurant

Totally 29 Burger restaurant and 49 pizza restaurant located in Konak region.

In order to better understand their distribution of categories we will be using pie chart as shown below;

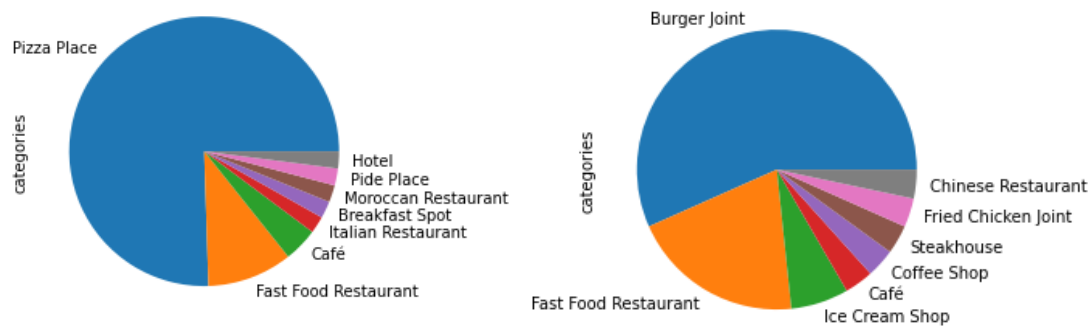


Fig.5 Categorical Pie Chart of Pizza and Burger Restaurant

C. Results

In this study, I analyze that relation between location of pizza and burger restaurant in Izmir/Konak by using geographical data.

As a result of geographical data map we are able to decide which location is the best option for our customer business establishment.

Also we are able to answer that which restaurant (Burger or Pizza) will be best competitive according to our customer request.

D. Discussion

It is seen that totally 29 Burger restaurant and 49 pizza restaurant are located in Konak region. Thus we can say that pizza restaurant is the best choice for our customer. It means that people who live in Konak prefer to eat pizza that is why there are lots of pizza restaurant in there.

In addition pie chart and bar chart says that most of pizza restaurant concentrate only pizza business.

And finally best location for pizza restaurant is around the middle of Konak. Most of pizza restaurant's owner prefer to set up their business in there. It means that most of people who love pizza also prefer to eat there.

F. Conclusion

As a conclusion according to our customer request middle side of Konak will be best location in order to set up new pizza restaurant. Thus competition will be increase and our customer's profitability will increase in the market.