



Faculty of Engineering  
and Technology



Miniproject Report

On

**Restaurant Recommendation System**

Submitted by

PC60 Ketki Kinkar

PC66 Shital Patil

PD19 Prathmesh Patil

PE39 Chirag Bhatta

PE53 Suvansu Paudel

Under the guidance of

Mrs. Vaishali Suryavanshi

Asst. Professor

**MIT-World Peace University (MIT-WPU)**

**Faculty of Engineering**

**School of Computer Engineering & Technology**

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## **Abstract**

Technology has created an exceptional platform for growth of every kind of business. The emerging use of technology urges the use of IT in all possible aspects of business. Today the hotel and restaurant business is one of the most growing businesses and has been helping a lot in the economy of the country.

Through this project, I have collected the necessary details of some of the most popular restaurants. The project analyzes the data of rating provided by the end users and uses the data to recommend foods and restaurants to the users. The recommendation is based on the feedback of different people on the food items. The recommendation is done on the basis of a collaborative filtering algorithm.

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## **Introduction**

Restaurant data analysis is one of the most useful analyses for foodies who want to taste the best cuisines of every part of the world which lies in their budget. This analysis is also for those who want to find the value for money restaurants in various parts of the country for the cuisines. Additionally, this analysis caters the needs of people who are striving to get the best cuisine of the country and which locality of that country serves that cuisines with maximum number of restaurants

## **Motivation**

It is very common that we hang out with families, friends, and coworkers when comes to lunch or dinner time. As the users of recommendation applications, people care more about how we will like a restaurant. People will tend to have happier experiences when the prediction of the recommendation system is as good as what it says. As there is a completed and big data set of user and restaurant reviews, we want to see whether we can use the latest techniques to make good predictions. In the data set, there are not only reviews but also relevant information of users and restaurants that allow us to do more complicated computation, which might lead to the construction of a better model.

## **Problem Statement**

In the past, people obtained suggestions for restaurants from friends or other conventional sources or sites. Although this method is straightforward and user-friendly, it has some severe limitations. First, the recommendations from friends or other common people are limited to those places they have visited before. Thus, the user is not able to gain information about places less visited by their friends. Besides that, there is a chance of users not liking the place recommended by their friends. Second, the information provided by the site can often be biased; thus the information provided cannot always be considered accurate. Our primary aim is to do data visualization with the help of matplotlib and Power BI and perform operations with MapReduce.

## Objective:

The main objectives of the application are:

- To collect user ratings on the cuisines of different restaurants.
- To recommend restaurants and foods to users based on their user ratings using collaborative filtering algorithm.
- To check online delivery systems of different restaurants.
- Location of the restaurant is an important factor to be considered when building a restaurant recommendation system. Location will be used to filter the restaurants from a top list.

## Scope and Limitation

Scope	Limitation
The restaurants and hotels from a huge range will be listed in the application.	Only the registered restaurants and hotels will be listed in the application.
	Only the registered users will be allowed to rate the foods. Users will be allowed to rate a particular food on the restaurant only once.

## Tools used

1. **Python:** We have used python for the main code in which we have used pandas numpy and matplotlib and have imported yelp.csv to show various kinds of visualizations which will be shown below.
2. **MongoDB:** MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.
  - a. We have used mongodb to do the mapreduce part of the code. Map-reduce is a data processing paradigm for condensing large volumes of data into useful aggregated results. To perform map-reduce operations, MongoDB provides the mapReduce database command.
3. **Powerbi:** Power BI is a business analytics service by Microsoft. It aims to provide interactive visualizations and business intelligence capabilities with an interface simple enough for end users to create their own reports and dashboards. It is part of the Microsoft Power Platform.
  - a. In Power Bi we have imported an csv file “restaurant.csv” using the data in it we have made various visualizations which will help users to get choose the restaurants and have a happy meal.

## Dataset Description

### Fetching the data:

Data has been collected from the Kaggle in the form of .json files(raw data) using the url=<https://www.kaggle.com/shrutimehta/zomato-restaurants-data?select=file5.json>

### Data Storage:

The collected data has been stored in the Comma Separated Value file Yelp.csv. Each restaurant in the dataset is uniquely identified by its Restaurant Id. Every Restaurant contains the following variables:

- Restaurant Id: Unique id of every restaurant across various cities of the world
- Restaurant Name: Name of the restaurant
- Country Code: Country in which restaurant is located
- City: City in which restaurant is located
- Address: Address of the restaurant
- Locality: Location in the city
- Locality Verbose: Detailed description of the locality
- Longitude: Longitude coordinate of the restaurant's location
- Latitude: Latitude coordinate of the restaurant's location
- Cuisines: Cuisines offered by the restaurant
- Average Cost for two: Cost for two people in different currencies
- Currency: Currency of the country
- Has Table booking: yes/no
- Has Online delivery: yes/ no
- Is delivering: yes/ no
- Switch to order menu: yes/no
- Price range: range of price of food
- Aggregate Rating: Average rating out of 5
- Rating color: depending upon the average rating color
- Rating text: text on the basis of rating of rating
- Votes: Number of ratings casted by people

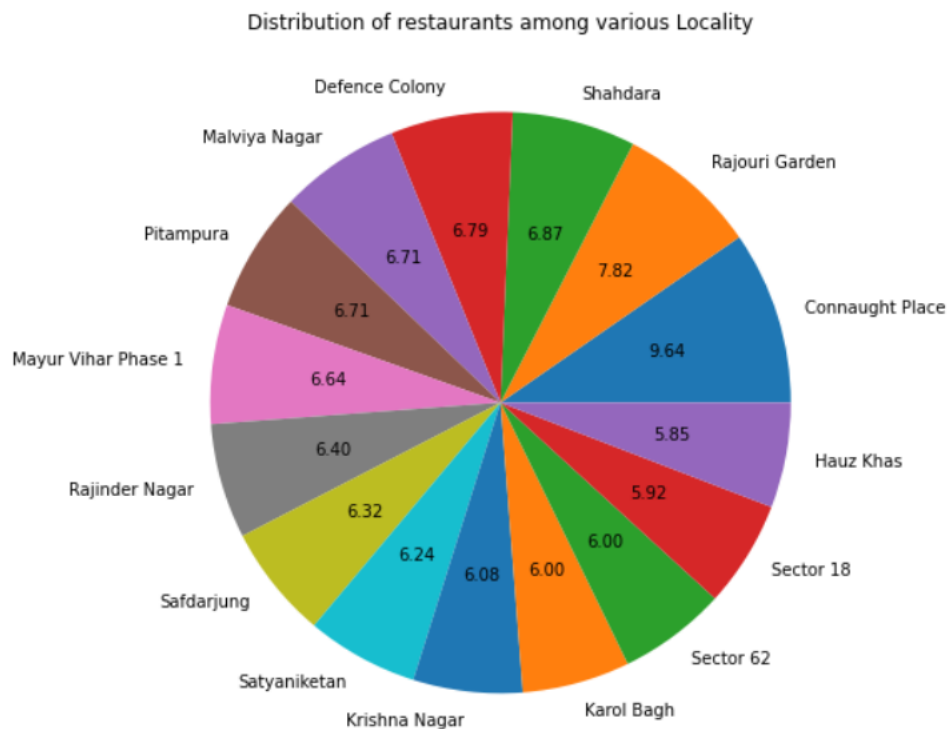


## Output

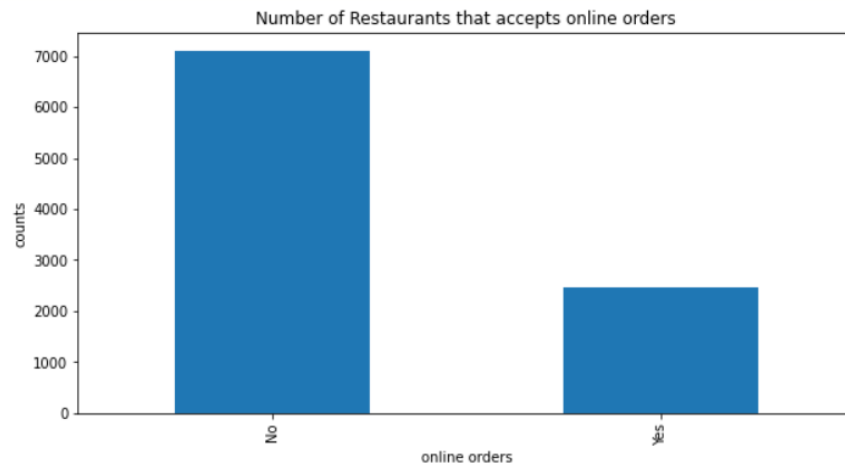
### Dataset Information:

```
Restaurant ID      0
Restaurant_Name    0
Country_Code       0
City               0
Address            0
Locality           0
Locality_Verbose   0
Longitude          0
Latitude           0
Cuisines           9
Average_Cost_for_two 0
Currency           0
Has_Table_booking  0
Has_Online_delivery 0
Is_delivering_now  0
Switch_to_order_menu 0
Price_range        0
Aggregate_rating    0
Rating_color        0
Rating_text         0
Votes              0
dtype: int64
```

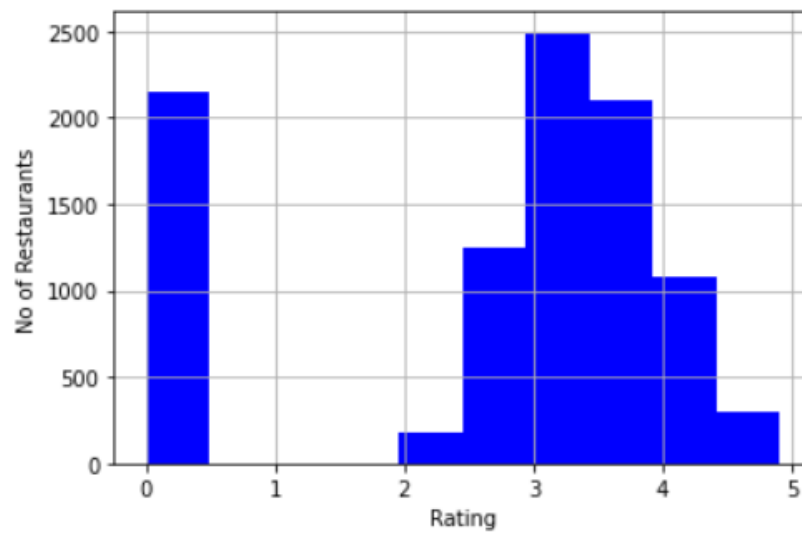
### Distribution of restaurants among first 15 Locality



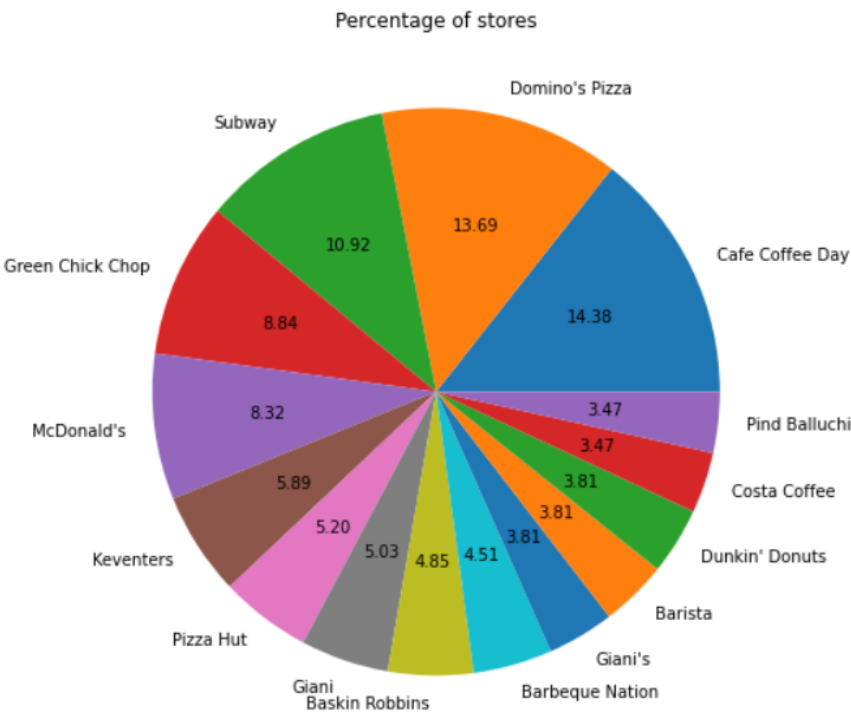
### Number of Restaurants that accepts online orders



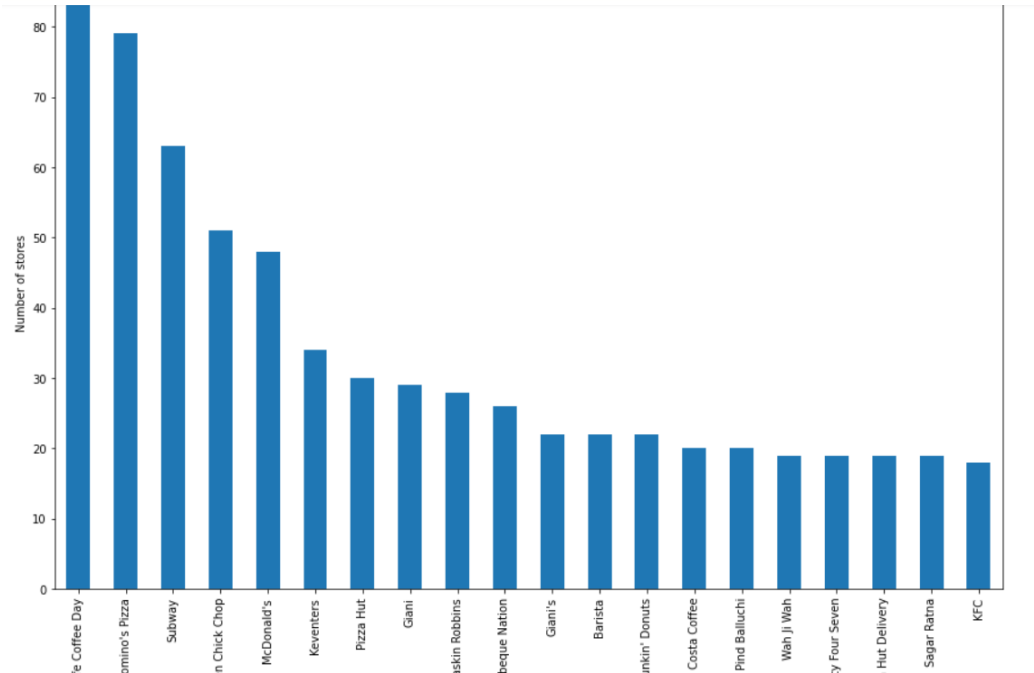
### No of Restaurants by Rating



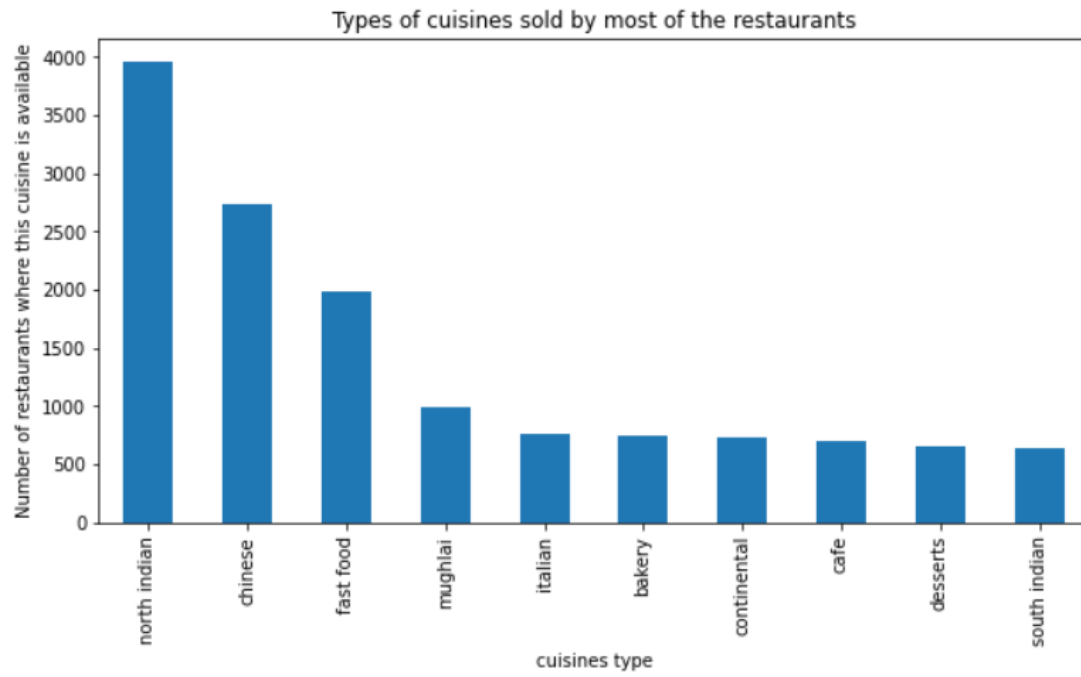
Percentage of stores by Restaurant\_Name



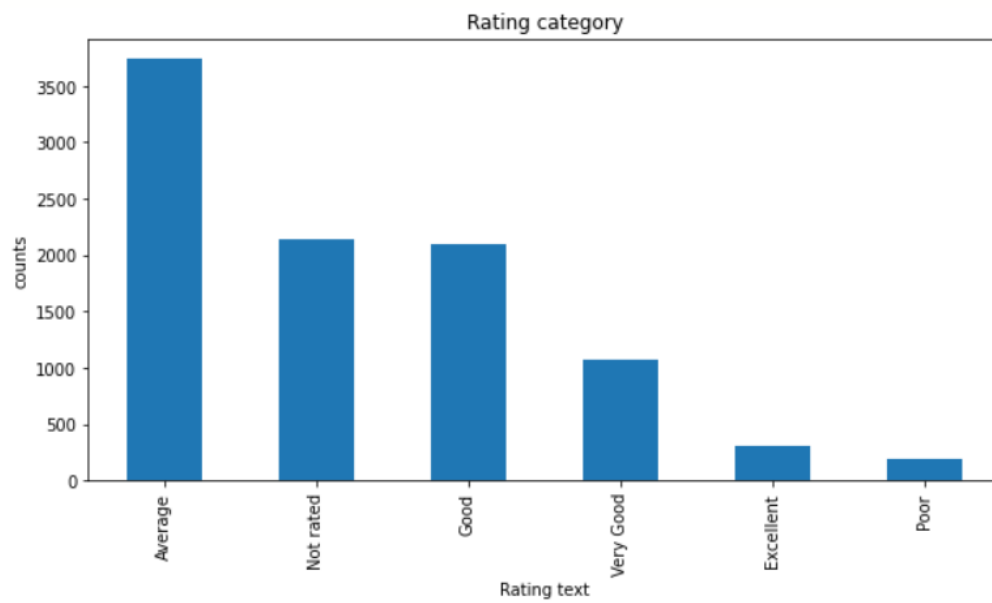
Number of stores for each restaurant



## Number of restaurants where this cuisine is available



## Rating Category



## Visualization screenshots

### MongoDB Mapreduce visualization

```
MongoDB Enterprise > var map4 = function(){emit(this.Restaurant_Name,1);};
MongoDB Enterprise > var red4 = function(id,cnt) {return Array.sum(cnt);};
MongoDB Enterprise > db.abc.mapReduce(map4,red4,{out:"map_red_exam"})
{
  "result" : "map_red_exam",
  "timeMillis" : 1694,
  "counts" : {
    "input" : 9551,
    "emit" : 9551,
    "reduce" : 740,
    "output" : 7446
  },
  "ok" : 1
}
MongoDB Enterprise > db.map_red_exam.find().pretty()
{ "_id" : 12212, "value" : 1 }
{ "_id" : "#45", "value" : 1 }
{ "_id" : "#Dilliwaala6", "value" : 1 }
{ "_id" : "#InstaFreeze", "value" : 1 }
{ "_id" : "#OFF Campus", "value" : 1 }
{ "_id" : "#Urban Caf  ", "value" : 1 }
{ "_id" : "#hashtag", "value" : 1 }
{ "_id" : "'Ohana", "value" : 1 }
{ "_id" : "10 Downing Street", "value" : 2 }
{ "_id" : "10 To 10 In Delhi", "value" : 1 }
{ "_id" : "11th Avenue Cafe Bistro", "value" : 1 }
{ "_id" : "13 Cafe", "value" : 1 }
{ "_id" : "145 Kala Ghoda", "value" : 1 }
{ "_id" : "17 Degree Food Service", "value" : 1 }
{ "_id" : "17 Degrees", "value" : 1 }
{ "_id" : "18 Degrees Resto Lounge", "value" : 1 }
{ "_id" : "19 Flavours Biryani", "value" : 1 }
{ "_id" : "1911 - The Imperial", "value" : 1 }
{ "_id" : "1911 Bar - The Imperial", "value" : 1 }
{ "_id" : "1918 Bistro & Grill", "value" : 1 }
Type "it" for more
```

```

C:\Users\PRATHESH\PATIL\mongodb-win32-x86_64-enterprise-windows-64-4.2.13\bin>mongoexport --db restaurant --collection map_red_exam1 --out G:\pdb\hasonlinedelivery.csv
2021-06-15T21:00:16.258+0530   connected to: mongodb://localhost/
2021-06-15T21:00:16.276+0530   exported 2 records

C:\Users\PRATHESH\PATIL\mongodb-win32-x86_64-enterprise-windows-64-4.2.13\bin>mongoexport --db restaurant --collection map_red_exam1 --out G:\pdb\isideliverynow.csv
2021-06-15T21:00:35.814+0530   connected to: mongodb://localhost/
2021-06-15T21:00:35.829+0530   exported 2 records

C:\Users\PRATHESH\PATIL\mongodb-win32-x86_64-enterprise-windows-64-4.2.13\bin>mongoexport --db restaurant --collection map_red_exam1 --out G:\pdb\hasonlinedelivery.csv
2021-06-15T21:01:05.325+0530   connected to: mongodb://localhost/
2021-06-15T21:01:05.343+0530   exported 2 records

C:\Users\PRATHESH\PATIL\mongodb-win32-x86_64-enterprise-windows-64-4.2.13\bin>mongoexport --db restaurant --collection map_red_exam2 --out G:\pdb\isideliverynow.csv
2021-06-15T21:01:14.231+0530   connected to: mongodb://localhost/
2021-06-15T21:01:14.249+0530   exported 2 records

```

```

mongoDB Enterprise > use restaurant
switched to db restaurant
mongoDB Enterprise > var map0 = function(){emit(this.Hus_Table_booking,1)};
mongoDB Enterprise > var red0 = function(id,cnt) {return Array.sum(cnt)};
mongoDB Enterprise > db.hsc.mapReduce(map0,red0,{out:"map_red_exam1"})
{
  "result" : "map_red_exam1",
  "timeMillis" : 496,
  "counts" : {
    "input" : 9551,
    "emit" : 9551,
    "reduce" : 97,
    "output" : 1
  },
  "ok" : 1
}
mongoDB Enterprise > db.map_red_exam1.find().pretty()
[ { "_id" : null, "value" : 9551 } ]
mongoDB Enterprise > var map0 = function(){emit(this.Hus_Table_booking,1)};
mongoDB Enterprise > var red0 = function(id,cnt) {return Array.sum(cnt)};
mongoDB Enterprise > db.hsc.mapReduce(map0,red0,{out:"map_red_exam2"})
{
  "result" : "map_red_exam2",
  "timeMillis" : 618,
  "counts" : {
    "input" : 9551,
    "emit" : 9551,
    "reduce" : 187,
    "output" : 2
  },
  "ok" : 1
}
mongoDB Enterprise > db.map_red_exam2.find().pretty()
[ { "_id" : "No", "value" : 8393 } ]
[ { "_id" : "Yes", "value" : 1158 } ]
mongoDB Enterprise > exit
bye

C:\Users\PRATHESH\PATIL\mongodb-win32-x86_64-enterprise-windows-64-4.2.13\bin>mongoexport --db restaurant --collection map_red_exam4 --out G:\pdb\hastablebooking.csv
2021-06-15T21:05:21.573+0530   connected to: mongodb://localhost/
2021-06-15T21:05:21.589+0530   exported 2 records

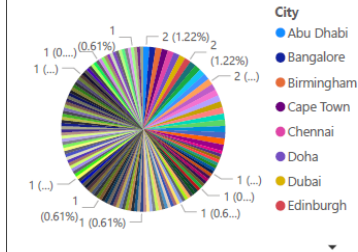
```

# Power Bi visualization

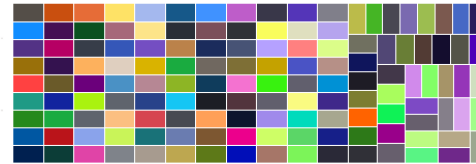
Count of Rating\_text by Restaurant\_Name and Rating\_text



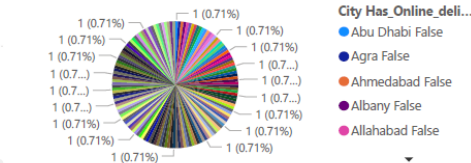
Count of Has\_Table\_booking by City



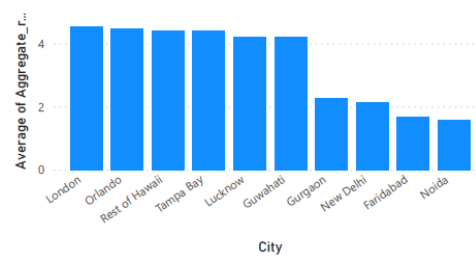
Count of Is\_delivering\_now by City



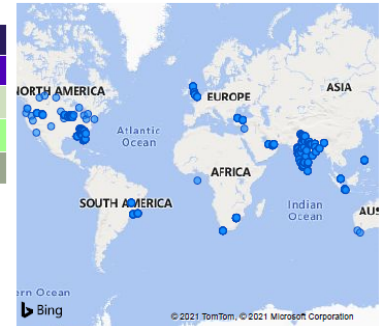
Count of Has\_Online\_delivery by Has\_Online\_delivery, City and City



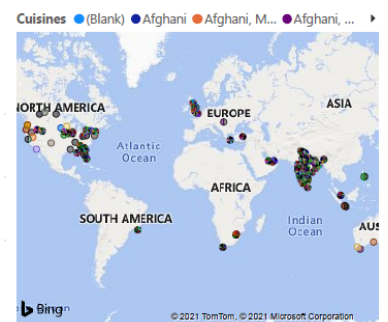
Average of Aggregate\_rating by City



First Restaurant\_Name by Latitude and Longitude



City and Cuisines



## **Conclusion**

As modern consumers, we greatly benefit from restaurant recommendation applications. It is so convenient to get a list of restaurants that match our preferences without much clicking, comparing, and browsing through a long list of reviews for each single business.

The restaurant recommendation system can provide users with accurate and effective restaurant information based on the user's preference. This project gives information to the users about different restaurants and their ratings. What all cuisines are found in different places and about the home delivery system in different cities and of different restaurants. The project manages to add information about many restaurants and will be applicable to many users who are interested in fooding.



## References

<https://www.kaggle.com/shrutimehta/zomato-restaurants-data?select=file5.json>

<http://www.ijctm.in/Admin/upload/IJCTM-07-10-2018-1201872-sherya.pdf>

[https://rstudio-pubs-static.s3.amazonaws.com/291845\\_d0953e0af88047668dc06b3d4e50aa1a.html](https://rstudio-pubs-static.s3.amazonaws.com/291845_d0953e0af88047668dc06b3d4e50aa1a.html)

<https://kishanraj-16649.medium.com/rating-prediction-of-restaurants-b51afd857e30>

<https://github.com/pragyasresta29/Restaurant-Recommendation-System/tree/master/recommendation%20system>

[https://www.kaggle.com/omkardray/keeping-it-fresh-predict-restaurant-inspections/version/1?select=restaurant\\_ids\\_to\\_yelp\\_ids.csv](https://www.kaggle.com/omkardray/keeping-it-fresh-predict-restaurant-inspections/version/1?select=restaurant_ids_to_yelp_ids.csv)

<https://youtu.be/fJ-5ygZBR0s>