

IBM Applied Data Science Capstone

BANGALORE – EAT TREAT

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Introduction and Business Problem

Introduction

The city of Bangalore, India is known as the Garden city, but it is packed with restaurants, night life and amazing people. For people that are new to Bangalore, it can be daunting to figure out what restaurants are worth going to and where they are. For people who are in Bangalore or visiting Bangalore, how do you know what the best places are to get something to eat based on your taste? How do you make a choice on which place will serve your hunger better?

Business Problem

For this project, I am going to put on my entrepreneur hat and create a simple guide on where to eat based on Foursquare ratings, price, category and geographic location data for restaurants in Bangalore. I will then cluster these restaurants based on their similarities so that a user can easily determine what type cuisine they are looking for.

Data Requirements

Data Requirements

For this project, I will be utilizing the Foursquare API to pull the following location data on restaurants in Bangalore:

- Venue Name
- Venue ID
- Venue Location
- Venue Category
- Count of Likes

Data Acquisition Approach

To acquire the data mentioned above, I will need to do the following:

- Get geolocator latitude and longitude coordinates for Bangalore.
- Use Foursquare API to get a list of all venues in Bangalore
 - Get venue name, venue ID, location, category, and likes

Methodology

Process

The thought process behind this is that likes are a proxy for quality. The more likes there are, the better the restaurant is. This might be incorrect in some cases with API call issues (how many I can use for free) holding me back from getting price / rating data. I will then bin this data into a quality categorical variable so we can cluster appropriately.

I am also going to create new categorical variables for the restaurants to better group them based on type of cuisine. This way you can look for good Mexican food or now what type of food might be best to eat in Bangalore if you are new to the area.

I will take the gathered data (see above in Data Acquisition Approach and Data Required sections) and will create a k-means clustering algorithm that groups restaurants into 4-5 clusters so that people looking to eat in Bangalore can easily see which restaurants are the best to eat at, what cuisine is available and where in Bangalore they can look to eat.

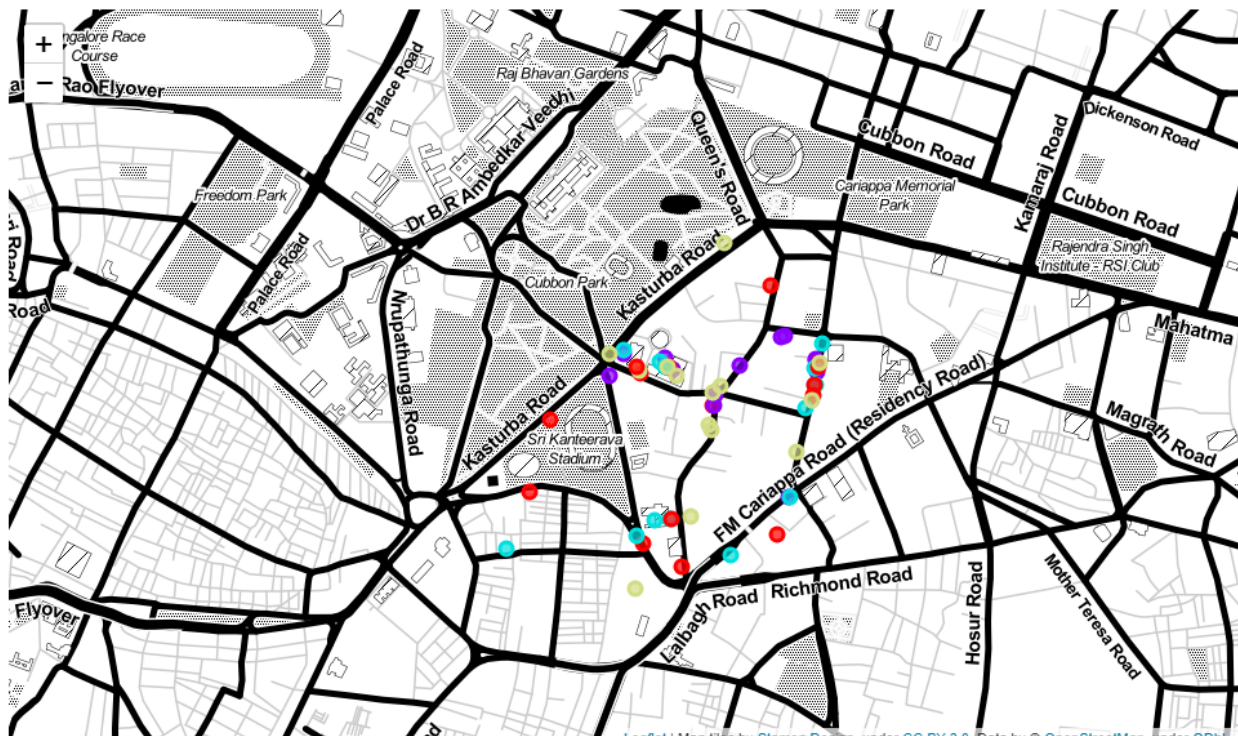
Mechanism

For this case, we will use the one hot encoding to code for the cuisine and the total likes for each restaurant. Then we use the K-Means clustering to group the restaurants into different clusters based on the likes.

We use then look at each cluster to deduce the conclusions.

Results

Map of Clusters for Users



Discussion

Running my clustering algorithm, I was able to generate four clusters of restaurants. These are as follows:

Cluster 1 characteristics

- Poor quality food
- Mostly Mexican Cuisine or Miscellaneous like Cafes

| | name | id | categories | lat | lng | total likes | total likes_cat | categories_new | label |
|----|-----------------------------------|--------------------------|-------------------------------|-----------|-----------|-------------|-----------------|------------------|-------|
| 19 | Sanchez | 589f63b8110d0313496f16d9 | Mexican Restaurant | 12.972018 | 77.596025 | 6 | poor | Mexican Cuisine | 3 |
| 35 | Le Cristaal | 4fe1cab3e4b079e195f1fdb1 | Restaurant | 12.971138 | 77.597548 | 7 | poor | Miscellaneous | 3 |
| 38 | BBC by JW Marriott | 5223435a11d2f93a6026432a | Café | 12.971847 | 77.595088 | 6 | poor | Miscellaneous | 3 |
| 43 | The Glass House - Deli Bistro Bar | 525e363211d2be5d7f023d0d | Restaurant | 12.970084 | 77.597443 | 6 | poor | Miscellaneous | 3 |
| 60 | Sky Bar | 4d394b5749cb236ae2afae47 | Bar | 12.969238 | 77.600361 | 6 | poor | Bars and Brewery | 3 |
| 62 | Sunheri Restaurant | 4f7c0584e4b0b7ee681d906f | Vegetarian / Vegan Restaurant | 12.964788 | 77.594987 | 7 | poor | Indian Cuisine | 3 |
| 69 | The Tower Kitchen | 5050aec7e4b0dd1afe0a1f4e | Italian Restaurant | 12.971671 | 77.596363 | 4 | poor | Italian Cuisine | 3 |
| 72 | Glen's Bakehouse | 57026b80498e4b8e5a111c5d | Café | 12.969916 | 77.597517 | 7 | poor | Miscellaneous | 3 |
| 76 | Subway | 4c6e3077e6b7b1f7ab04ac8e | Sandwich Place | 12.976016 | 77.597939 | 4 | poor | Miscellaneous | 3 |
| 77 | cafe coffee day | 4d5d3d7b935e60fcaa1b3ec0 | Coffee Shop | 12.972392 | 77.594108 | 0 | poor | Miscellaneous | 3 |
| 83 | Cafe Coffee Day | 4c613804924b76b0ed5bfab9 | Café | 12.967111 | 77.596810 | 2 | poor | Miscellaneous | 3 |
| 84 | Barista Lavazza | 4bb6fc69f562ef3b4df13097 | Café | 12.971334 | 77.597802 | 0 | poor | Miscellaneous | 3 |
| 86 | Baskin-Robbins | 4cc7e204ee718cfa5b7cb43d | Ice Cream Shop | 12.971975 | 77.601041 | 0 | poor | Miscellaneous | 3 |
| 92 | Sanchos | 5350bcad498e6f05f68d1a99 | Mexican Restaurant | 12.972002 | 77.596050 | 6 | poor | Mexican Cuisine | 3 |
| 93 | Scottish Pub | 4c14b26a583c9c7466a43fa4 | Pub | 12.971991 | 77.601026 | 5 | poor | Bars and Brewery | 3 |
| 96 | Sidewalk Cafe | 4ff6bf6de4b038644b1b7b91 | Café | 12.970888 | 77.600857 | 6 | poor | Miscellaneous | 3 |
| 99 | Juice Junction | 4c0755bda0129c74017fd2c9 | Juice Bar | 12.972093 | 77.601103 | 5 | poor | Miscellaneous | 3 |

Cluster 2 characteristics

- Above average quality food
- Mostly Bars, Indian and Italian Cuisine

Coursera Capstone

| | name | id | categories | lat | lng | total likes | total likes_cat | categories_new | label |
|----|---------------------|--------------------------|----------------------|-----------|-----------|-------------|-----------------|------------------|-------|
| 25 | Kebabs & Kurries | 4bb224ccf964a52010bd3ce3 | Indian Restaurant | 12.966995 | 77.595613 | 15 | above avg | Indian Cuisine | 2 |
| 29 | Alba | 524c709211d27c7b392a7897 | Italian Restaurant | 12.972541 | 77.594594 | 15 | above avg | Italian Cuisine | 2 |
| 31 | Natural Ice Cream | 4bbcb9407809521edadd991 | Ice Cream Shop | 12.971378 | 77.600989 | 34 | above avg | Miscellaneous | 2 |
| 40 | Oh Calcutta | 4bc55ec741cb76b0e5553e6f | Indian Restaurant | 12.971405 | 77.600935 | 14 | above avg | Indian Cuisine | 2 |
| 44 | The Cubbon Pavilion | 4c5c19a29b28d13a47c55570 | Wine Bar | 12.967029 | 77.596120 | 28 | above avg | Bars and Brewery | 2 |
| 47 | Big Straw | 532a5bd611d2652e7d6a6e4a | Bubble Tea Shop | 12.972729 | 77.601201 | 17 | above avg | Miscellaneous | 2 |
| 49 | Chai Point | 5080ddc0e4b093287af8e279 | Café | 12.967753 | 77.600135 | 15 | above avg | Miscellaneous | 2 |
| 50 | Mahesh Lunch Home | 50bf61e5e4b05b9d6aeb2f16 | Seafood Restaurant | 12.965882 | 77.598155 | 37 | above avg | Italian Cuisine | 2 |
| 57 | Kudla | 4bdaf5f3904a5937407489e | Indian Restaurant | 12.966512 | 77.595007 | 14 | above avg | Indian Cuisine | 2 |
| 71 | Farzi Cafe | 576d417acd10921475b851ae | Bistro | 12.972136 | 77.595803 | 26 | above avg | Miscellaneous | 2 |
| 78 | Siddappa Hotel | 4c9041820b9e37043f75665e | Breakfast Spot | 12.966094 | 77.590705 | 19 | above avg | Indian Cuisine | 2 |
| 81 | Cafe Mangii | 5110cd35e4b0162f3fc169ee | Italian Restaurant | 12.971985 | 77.595971 | 20 | above avg | Italian Cuisine | 2 |
| 82 | The Open Box | 561e7bab498e0818a0becbcb | Pub | 12.970632 | 77.600642 | 19 | above avg | Bars and Brewery | 2 |
| 91 | Sing Kong | 535a37f9498ef006e44630a2 | Cantonese Restaurant | 12.971985 | 77.596011 | 16 | above avg | Chinese Cuisine | 2 |
| 95 | Noon Wines | 4b9ba56af964a520601636e3 | Bar | 12.971953 | 77.600928 | 17 | above avg | Bars and Brewery | 2 |

Cluster 3 characteristics

- High quality food
- Mostly Asian cuisine and Indian Breakfast spots.

| | name | id | categories | lat | lng | total likes | total likes_cat | categories_new | label |
|----|------------------------|--------------------------|--------------------------|-----------|-----------|-------------|-----------------|------------------|-------|
| 2 | Toscana | 4bc1cd90b492d13a4e74a660 | Italian Restaurant | 12.971980 | 77.596066 | 127 | great | Italian Cuisine | 1 |
| 3 | Shiro | 4b895510f964a520442c32e3 | Japanese Restaurant | 12.971900 | 77.596236 | 140 | great | Asian Cuisine | 1 |
| 4 | Café Noir | 4baef172f964a5202ce33be3 | French Restaurant | 12.971995 | 77.596001 | 163 | great | European Cuisine | 1 |
| 8 | J W Kitchen | 523de40611d2996a150886fc | Asian Restaurant | 12.972410 | 77.594592 | 43 | great | Asian Cuisine | 1 |
| 15 | The Biere Club | 4dd3f3d27d8b6704c7b0ddde | Brewery | 12.971061 | 77.597657 | 360 | great | Bars and Brewery | 1 |
| 17 | Sunny's | 4bebb117b3352d7f6fc656d2 | Italian Restaurant | 12.972023 | 77.598454 | 85 | great | Italian Cuisine | 1 |
| 21 | Corner House | 4bfd513fe9309521040962ab | Ice Cream Shop | 12.972979 | 77.599971 | 59 | great | Miscellaneous | 1 |
| 23 | Airlines Hotel | 4bb59ca0f562ef3bd3262f97 | Breakfast Spot | 12.972948 | 77.599831 | 230 | great | Indian Cuisine | 1 |
| 24 | Bootlegger | 52136774bce6d23454ea87db | Pub | 12.971159 | 77.597574 | 134 | great | Bars and Brewery | 1 |
| 26 | Truffles - Ice & Spice | 4bd446b341b9ef3b27a801e6 | Burger Joint | 12.971802 | 77.601031 | 266 | great | American Cuisine | 1 |
| 28 | Coffee Day Square | 4b759767f964a520b4162ee3 | Coffee Shop | 12.971671 | 77.594132 | 80 | great | Miscellaneous | 1 |
| 30 | Harima | 4b97ad0bf964a5200c0f35e3 | Sushi Restaurant | 12.967755 | 77.600073 | 48 | great | Asian Cuisine | 1 |
| 32 | MTR 1924 | 4c4293173735be9a49551aa4 | Indian Restaurant | 12.972196 | 77.600990 | 54 | great | Indian Cuisine | 1 |
| 33 | Soda Bottle Openerwala | 55351347498e151e387373fd | Parsi Restaurant | 12.970747 | 77.597607 | 77 | great | Asian Cuisine | 1 |
| 37 | Fava | 4ba5d1eef964a5200f2439e3 | Mediterranean Restaurant | 12.972286 | 77.595966 | 45 | great | European Cuisine | 1 |
| 59 | The Egg Factory | 4b5bbf41f964a520e31329e3 | Breakfast Spot | 12.972217 | 77.600978 | 136 | great | Indian Cuisine | 1 |

Cluster 4 characteristics

- below average quality food
- Mostly local Indian cuisine (may be due to lack of reveiws/likes by the consumers)

| | name | id | categories | lat | lng | total likes | total likes_cat | categories_new | label |
|----|-------------------------|--------------------------|-------------------------|-----------|-----------|-------------|-----------------|------------------|-------|
| 9 | Bengaluru Baking Co. | 51efe570498e01081549f692 | Bakery | 12.971761 | 77.595128 | 9 | below avg | Miscellaneous | 0 |
| 14 | Margarita Lounge Bar | 53b80bcc498ed9a71ea89302 | Cocktail Bar | 12.970741 | 77.597553 | 12 | below avg | Bars and Brewery | 0 |
| 27 | Kentucky Chicken Corner | 4d026595e5f16ea8adc4aa28 | Fried Chicken Joint | 12.966260 | 77.595217 | 11 | below avg | American Cuisine | 0 |
| 41 | Sancho's | 53480aea498ecf9ff5a85bd1 | Mexican Restaurant | 12.971981 | 77.595997 | 13 | below avg | Mexican Cuisine | 0 |
| 51 | EDO | 4c6d3917e6b7b1f70709a98e | Japanese Restaurant | 12.967046 | 77.596180 | 13 | below avg | Asian Cuisine | 0 |
| 52 | MTR Restaurant | 4d1ee872dd6a236a55c82b38 | South Indian Restaurant | 12.972159 | 77.601039 | 11 | below avg | Indian Cuisine | 0 |
| 55 | Rice Bowl | 4bfaab6f328d76b0dbd814ec | Chinese Restaurant | 12.974596 | 77.599470 | 11 | below avg | Chinese Cuisine | 0 |
| 56 | Konark Kanteerava | 541ff4ca498ed1e0078a43f4 | Karnataka Restaurant | 12.970281 | 77.592165 | 8 | below avg | Indian Cuisine | 0 |
| 58 | Palate Corner | 4da5e4380cb6d75e2a016d88 | Indian Restaurant | 12.967921 | 77.591444 | 8 | below avg | Indian Cuisine | 0 |
| 61 | Rasvara | 545e3fe3498eb8917cb5fa8c | Rajasthani Restaurant | 12.971995 | 77.596079 | 11 | below avg | Indian Cuisine | 0 |

Conclusion

- With Indian breakfast spots claiming the top quality, it is highly recommended to try this for some lip-smacking delicacies.
- Bars and Italian are the next best options with good quality food and mostly a great ambience.
- Some Indian restaurants with less likes can also be tried and reviewed so that it gets benefitted for both the data scientists and the foodies.

References

- Foursquare API for venues, venues ID, venues category and likes
- Wikipedia to learn about the central Bangalore :
<https://en.wikipedia.org/wiki/Bangalore>