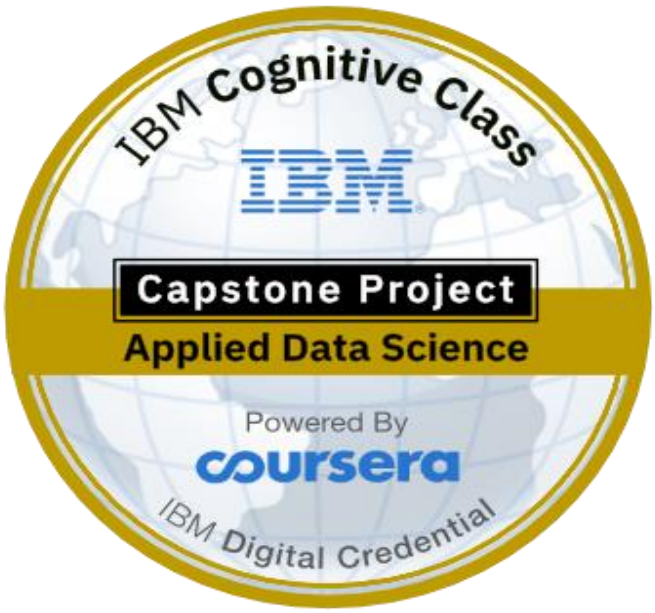


The Battle of Neighborhoods - Week 5

Title: Restaurant Recommender System for Chennai

1. Introduction

1.1 Background

This final project is to build a better Restaurant Recommender system for Chennai location.

Chennai is the capital city of southern state of India, namely Tamil nadu. Chennai witness thousands of tourists each month and also thousands of visitors for medical purposes from various parts of world and from India.

Also it is highly populated with workers from other states who were attracted due to high concentration of industries and factories.

1.2 Problem

There is a need for these migrant and tourist people to search for restaurants which serves their local food in Chennai.

Due to vast demographic area in Chennai and it is highly populated, there were large of restaurants in each locality which serves different variety of cuisines.

So it is very difficult to filter these restaurants and choose correct restaurant based on cuisines and cost of food.

This project is to build an recommender system to identify Restaurants in Chennai. So that it will be easier for people to choose restaurants which are nearby and also priced according to their needs.

2. Data Requirements

2.1 Data

To build a Restaurant Recommender model for Chennai location, we need below data:

1. Chennai's geographical coordinates (latitude and longitude) to find neighborhood details.
2. Population of the neighborhood where the restaurant is located.
3. Restaurant details in locality and its cuisines.

Let's take detail look at each of these:

1. To access each restaurants in neighborhood location, we need it's Latitude and Longitude so that we can point at its coordinates and create a map displaying all the restaurants with its labels respectively.
2. Population of a neighborhood is very important factor to determine a restaurant's growth. More people visit, better the restaurant will be rated because it is accessed by different people with different taste.
3. Income level of a neighborhood is also very important factor. If people in a neighborhood earns more than an average income, then it is likely that they will spend more. So restaurant can access market demand to income of a neighborhood.

2.2 Data Collection

I have used Zomato's Chennai restaurant 2020 details for this project.

This dataset have list of all restaurants which were served by Zomato delivery team along with location and ratings details.

Zomato dataset have below features:

- Zomato URL
- Name of Restaurant
- Address Location
- CuisineTop Dishes
- Price for 2
- Dining Rating
- Dining Rating Count
- Delivery Rating
- Delivery Rating Count
- Features

	Zomato URL	Name of Restaurant	Address	Location	Cuisine	Top Dishes	Price for 2	Dining Rating	Dining Rating Count	I
0	https://www.zomato.com/chennai/yaa-mohaideen-b...	Yaa Mohaideen Briyani	336 & 338, Main Road, Pallavaram, Chennai	Pallavaram	['Biryani']	['Bread Halwa', ' Chicken 65', ' Mutton Biryan...	500.0	4.3	1500	
1	https://www.zomato.com/chennai/sukkubhai-biriy...	Sukkubhai Biriyani	New 14, Old 11/3Q, Railway Station Road, MKN ...	Alandur	['Biryani', ' North Indian', ' Mughlai', ' Des...	['Beef Biryani', ' Beef Fry', ' Paratha', ' Pa...	1000.0	4.4	3059	
2	https://www.zomato.com/chennai/ss-hyderabad-bi...	SS Hyderabad Biryani	98/339, Arcot Road, Opposite Gokulam Chit Fun...	Kodambakkam	['Biryani', ' North Indian', ' Chinese', ' Ara...	['Brinjal Curry', ' Tandoori Chicken', ' Chick...	500.0	4.3	1361	
3	https://www.zomato.com/chennai/kfc-	KFC	10, Periyar Nagar, 70 Feet Road	Perambur	['Burger', ' Fast Food', '	['Zinger	500.0	4.3	1101	

2.3 Data Cleaning

First step is to preprocess the dataset to clean and impute missing NaN values.

Preprocess summary was shown below:

```
Zomato URL                  0
Name of Restaurant          0
Address                     0
Location                    0
Cuisine                     0
Top Dishes               9641
Price for 2                 0
Dining Rating            5351
Dining Rating Count      5351
Delivery Rating          5851
Delivery Rating Count    5851
Features                    0
dtype: int64
```

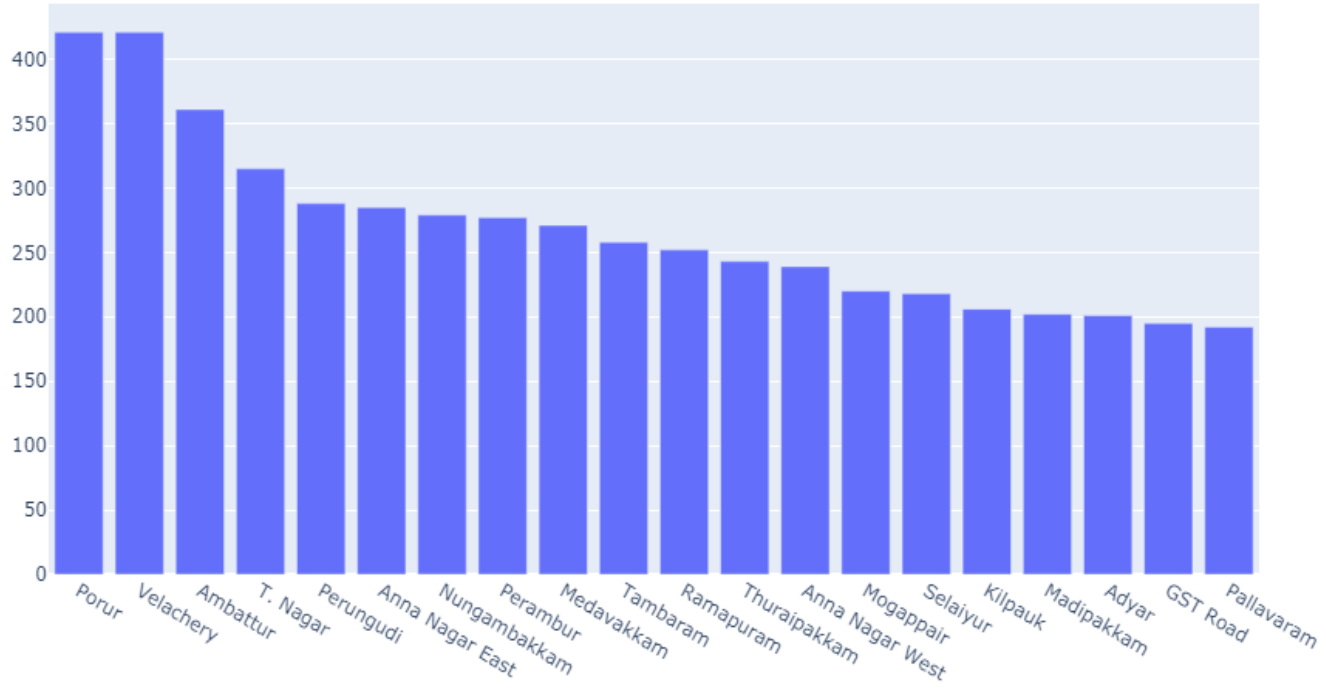
2.4 Feature Extraction

- Replace feature names in data set which have space in between names with short feature names.
- Split the feature Location details based on comma separators
- Create list all of all unique locations in Chennai
- One hot encoding of Ratings for Restaurant based on price
- One hot encoding of Ratings for Restaurants based on taste

3. Exploratory Data Analysis

3.1 Pre-processing Reports

Display the Bar chart for **Chennai Restaurants - Location wise**

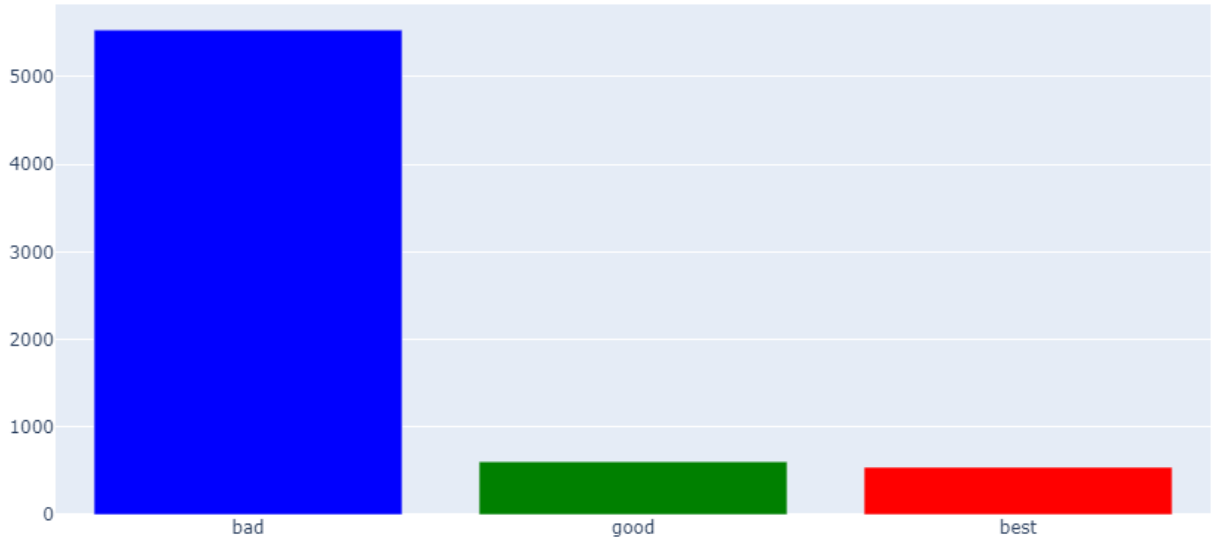


List the name of **Restaurants Franchise Details**

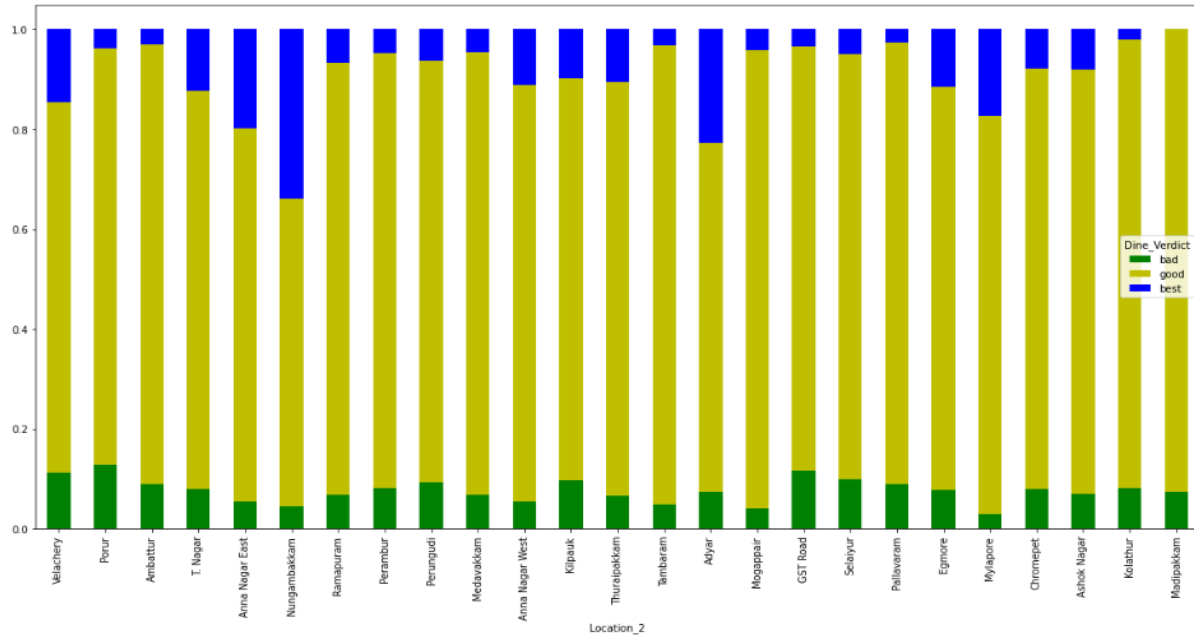
```
df['name of restaurant'].value_counts()[:25]
```

```
ck's bakery                 83
amma unavagam               78
domino's pizza              66
oyalo                       59
lassi shop                  58
cafe coffee day             51
five star chicken           50
meat and eat                48
a2b - adyar ananda bhavan   45
ibaco                       44
hyku foods                  41
mcrennett                   39
the cake world              39
faasos                      38
the biryani life            38
ovenstory pizza             38
sweet truth                 38
subway                      38
firangi bake                37
the good bowl               37
cake square                 36
behrouz biryani             36
mumbai kulfi                36
pizza square                34
sri krishna sweets          33
Name: name of restaurant, dtype: int64
```

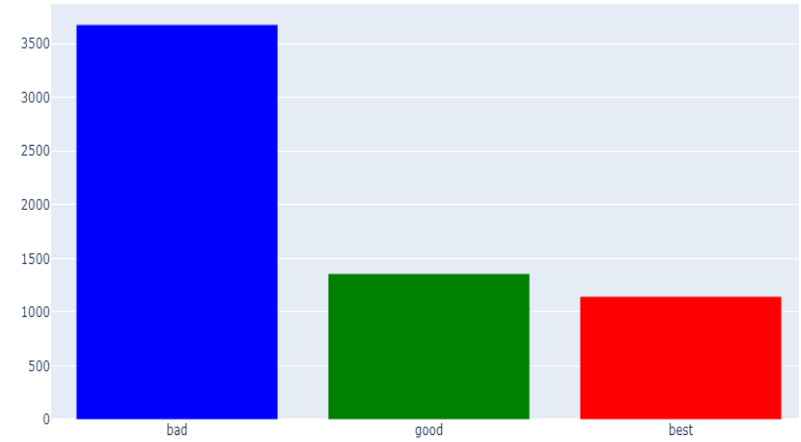
Display the Bar chart for **Rating Distribution wise - Dine only Ratings**



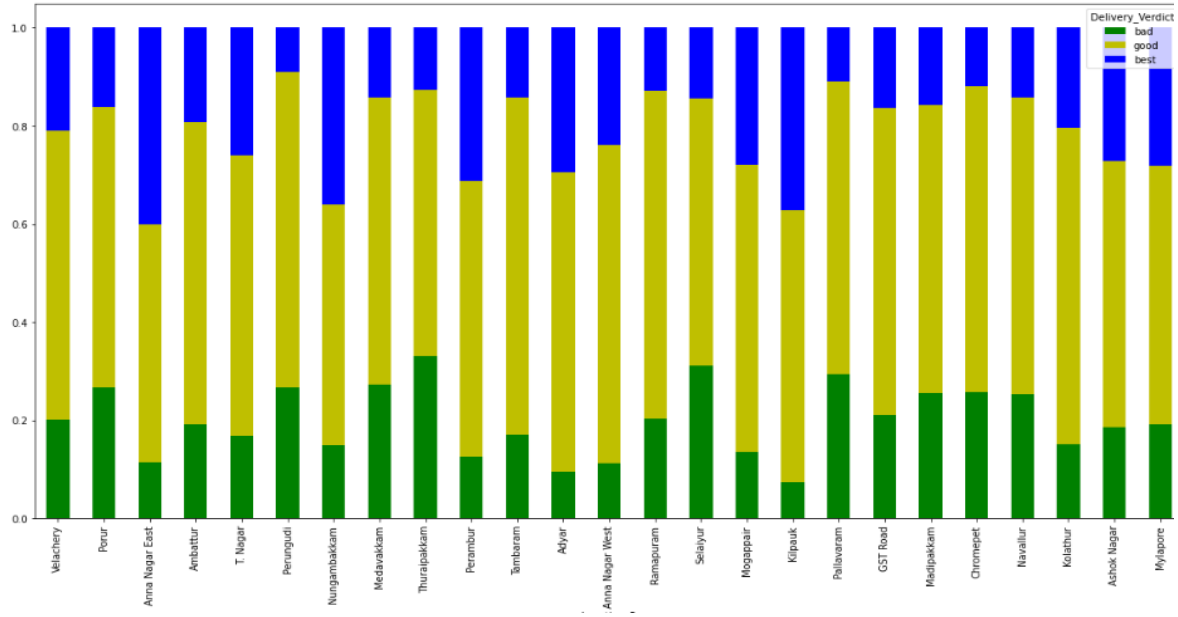
Display the Bar chart for **Location wise Ratings - Dine only Ratings**



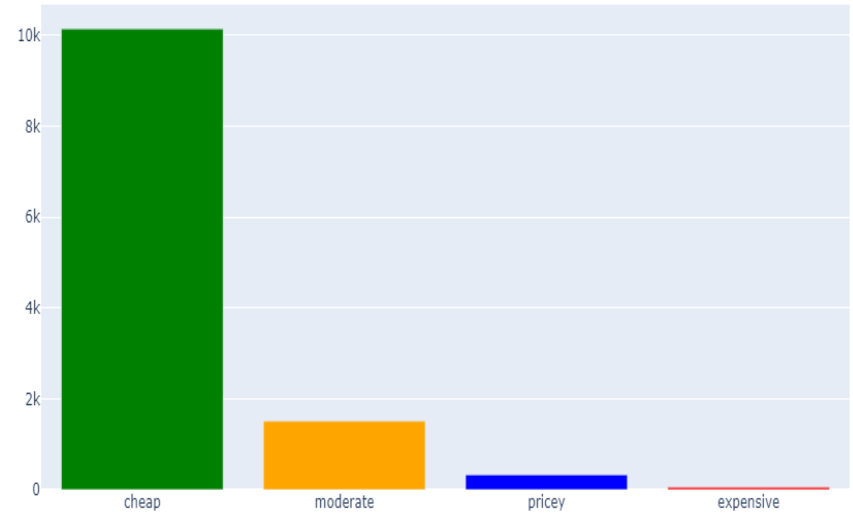
Display the Bar chart for **Rating Distribution wise - Delivery only Ratings**



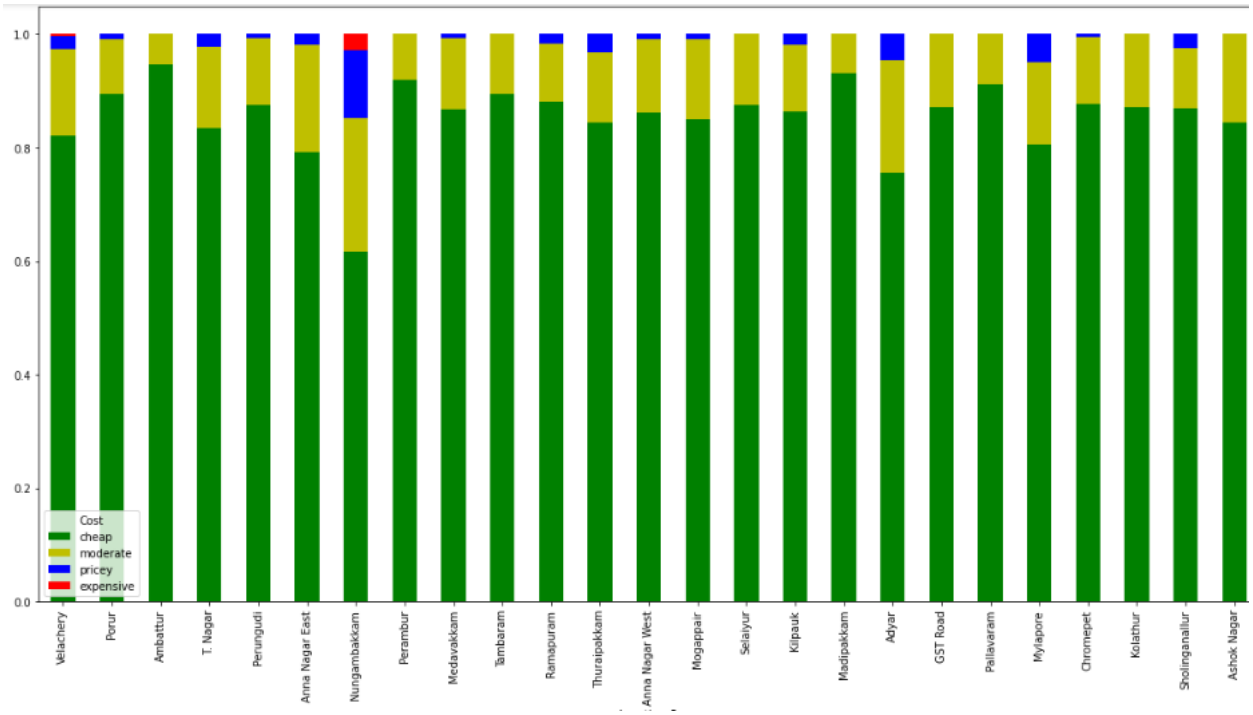
Display the Bar chart for **Rating Distribution wise - Location wise**



Display the Bar chart for **Price Comparison Distribution wise - Location wise**



Display the Bar chart for **Price Comparison - Location wise**

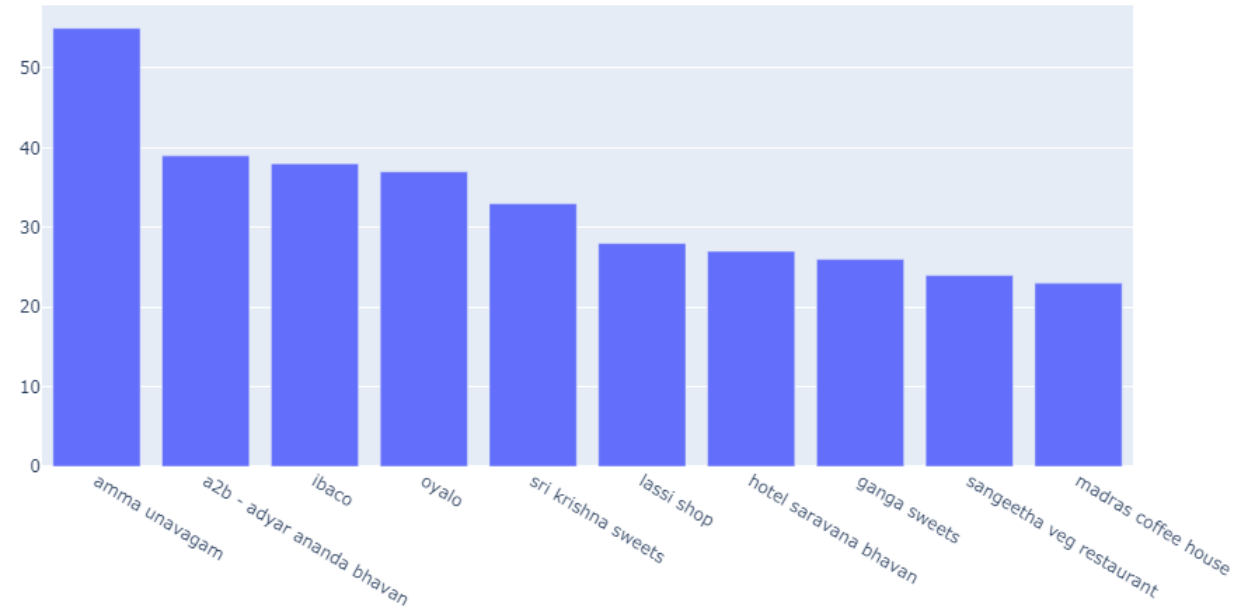


4. Predictive Modelling

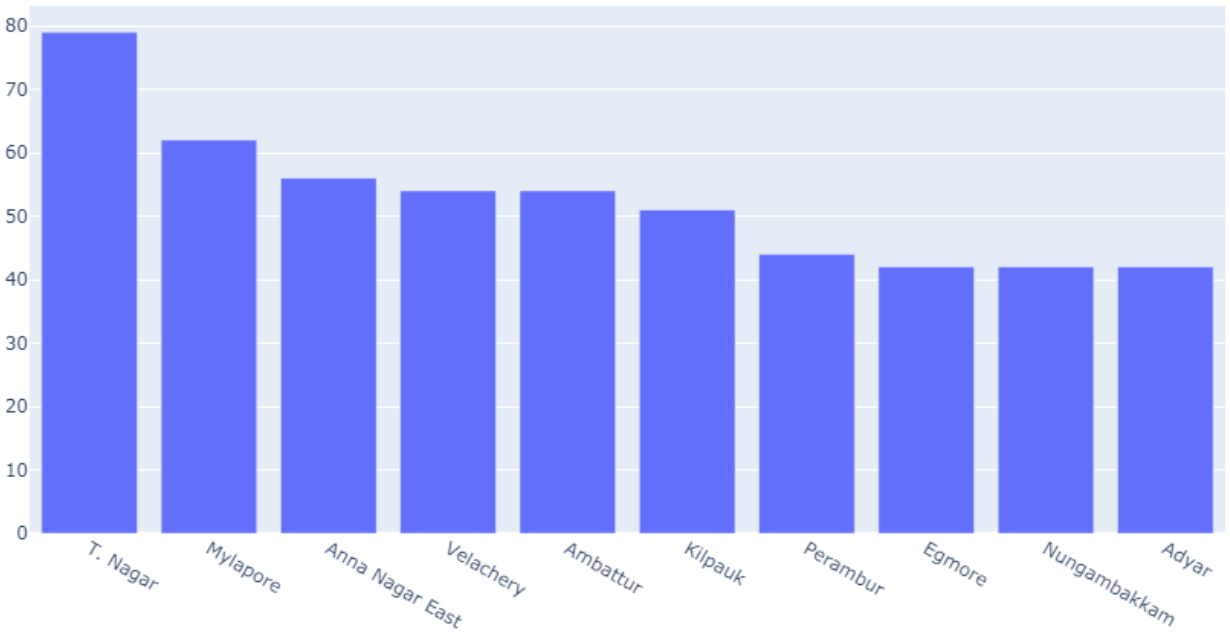
Display the word cloud chart for **Top Dishes in Chennai**

Display the word cloud chart for **Popular Cuisines served in Chennai**

Display the Bar chart for **Restaurants which serve Vegetarian food in Chennai**



Display the Bar chart for **Locations with maximum Vegetarian Restaurants**



List the **Most Popular Restaurants in Chennai**

	Name of Restaurant	Location_2	Dining Rating Count	Delivery Rating Count
89	Coal Barbecues	Velachery	9410.0	NaN
9233	Barbeque Nation	T. Nagar	5821.0	NaN
74	Onesta	Semmancheri	5407.0	4375.0
9030	Paradise Biryani	Perungudi	5317.0	18200.0
9026	Copper Kitchen	Porur	5073.0	26800.0
9038	Palmshore	Ramapuram	4805.0	17300.0
9040	Palmshore	Ashok Nagar	4478.0	19800.0
8757	Yaa Mohaideen Biryani	Pallavaram	3414.0	NaN
1	Sukkubhai Biriyani	Alandur	3059.0	39200.0
9039	Palmshore	Santhome	3056.0	11100.0

5. Conclusion

- Chennai have most varieties of restaurants which serves North Indian to South Indian, Continental to Chinese food.
- All major Restaurant chains have restaurants in all parts of Chennai.
- Chennai have both cheap Restaurant food and also have expensive Restaurant food.
- Due to wide range in price and cuisines, Chennai is the best place to dine.
- This Restaurant Recommender system will help the users to select the best restaurant to dine.