KLE Technological University
Creating Value
Leveraging Knowledge
B. V. Bhoomaraddi Engineering & Technology College Campus, Hubballi – India

COURSE TITLE: EXPLORATORY DATA ANALYSIS

COURSE CODE:21ECSC210

PROJECT TITLE: ANALYSIS ON RESTAURANTS

SUBMITTED BY:

TEAM NO 13

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Abstract:

The purpose of this study is to understand the risks, leverages along with issues and challenges that are being faced by the industry. The same has been done with the help of Comparative Financial Analysis amongst the one of the prominent players of the industry i.e. Restaurant industry. It's concluded that Restaurant industry as a whole has been in turmoil in the past couple of years which is clearly evident in the performance of all the firms that are taken up for the purpose of though few indicators have indicated towards the prosperous future of the industry. Results indicate that food quality and atmosphere have a significant positive effect on rating but not on votes. This report analyses many factors that affect the restaurant industry from financial perspective and the suggestive measures to overcome the same.

Keywords: Restaurants, Financial Analysis, Food Industry

INTRODUCTION:

Eating is one of life's pleasure and pride – so is cooking and serving good food to others. A restaurant is a commercial outfit which specializes in the preparation of quality food and to serve them to satisfy the customer's demands. Their motto is "Customers are our assets and satisfied customers are our source of wealth". Restaurants do have state of the art kitchens in their premises, where food items are prepared, following a fixed menu to serve the customers. Most restaurants are also equipped with infrastructure facilities, table settings, and dining halls of various sizes to cater to needs of small gatherings to grandiose banquets to suit customer demands and above all, trained personnel to provide a satisfactory service.

A restaurant is an eating place where people are served food, drinks and desserts for their money. The food is served normally within a building even though presently, one can be given packed food to be eaten away. Food in a restaurant is prepared by chefs. Sometimes, restaurants specialize in the kind of food they offer.

The term restaurant (from the French word trestaurer, to restore) first appeared in the 16th century, meaning "a food which restores", and referred specifically to a rich, highly flavoured soup. The modern sense of the word was born around 1765 when a Parisian soup-seller named Boulanger opened his establishment. Whilst inns and taverns were known from antiquity, these were establishments aimed at travellers, and in general locals would rarely eat there. The modern formal style of dining, where customers are given a plate with the food already arranged on it, is known as service à la russe, as it is said to have been introduced to France by the Russian Prince Kurakin in the 1810s, from where it spread rapidly to England and beyond.

PROBLEM STATEMENT:

Analysis of day by day growing restaurants business in different cities with respect to rating, votes, price and cuisine.

- **Data Understanding**

Datasets:

1. Restaurant Indian Dataset: - RestaurantI_Dataset.csv
   Data size = 114319 rows × 18 columns
2. Restaurant Metro City Dataset: - RestaurantM_Dataset.csv
   Data size= 114319 rows × 18 columns

Attributes:

ATTRIBUTE NAME	DESCRIPTION	TYPE OF DATA
NAME	Restaurant name.	Nominal Data
CITY	Restaurant belongs to that particular city.	Nominal Data
REGION	A particular area or part of the city.	Nominal Data
PRICE	Price Of Food Item.	Continuous Data
VOTES	Number of Customers voted for this restaurant.	Discrete Data
CUISINE CATEGORY	Type of food.	Categorical Data

PAGE NO	It specifies on which page the restaurant is available.	Numerical Data
TIMING	Timing of Restaurant.	Continuous Data
RATING	On the scale of 1-5 customers have rated the restaurant.	Ordinal Data
RATING TYPE	It defines whether the restaurant is Bad, Good and Average.	Ordinal Data
MEN_EMPLOYEE	Number of men working in the restaurant.	Discrete Data
WOMEN_EMPLOYEE	Number of women working in the restaurant.	Discrete Data
DELIVERED_FOOD_APPROX	Number of food packets delivered from that restaurant in a month.	Discrete Data
DELIVERY_TIME	Time taken for delivering the food.	Continuous Data

PEAK TIME	The time at which restaurant has maximum profit.	Continuous Data
CUISINE TYPE	Type of Restaurant.	Categorical Data

- **Data Pre-Processing**
- **Data Integration:**
  - Integrating the Restaurant Indian Dataset and Restaurant Metro City Dataset

- **Data Cleaning:**

➢ Dropped Columns:
  - URL, PAGENO, TIMING and RATING_TYPE are dropped as they are no use to our analysis.

➢ Elimination of Null Values present in dataset
  - Null values present in NAME, CITY, REGION are dropped.
  - Null values present in RATING And VOTES can't be replaced by mean, median and frequency hence it should be dropped.

- Data Standardisation:
  - Conversion of Rating and Votes that are in object should be converted into numeric.

Questions:

- In metro cities we can compare the approximate number of food packets delivered and see how they vary among the different cities.
- Compare the total number of the employees i.e., based on gender working in restaurant.
- Generate the commission percent from each restaurant and vary it according to the cities, metro cities and even based upon the platform also conclude.
- Restaurant which has good ratings i.e., above 4.5 and low price i.e., below 500.
- Find out the top restaurants of a region & city based upon the maximum number of food packets delivered.
- Find out the best-selling food item/type in a region & city.
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- Find out the best-selling food item/type in a region & city.
- Restaurants with good rating and how well they can advertise.

The 6 major questions and working on its analysis:

1. City that pays the highest commission price to Zomato for delivering the food.

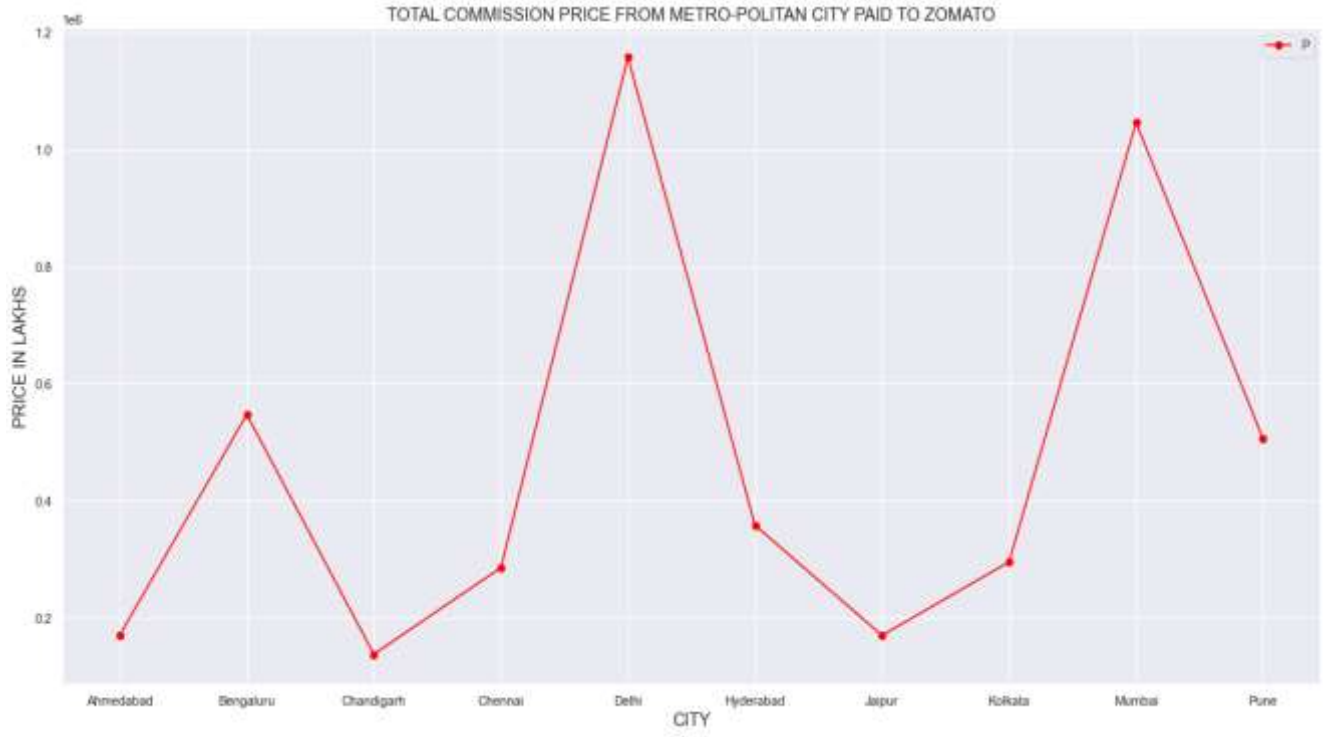

Fig 1: Total commission price paid to Zomato from each city.

Inference:

- Delhi pay's the highest commission price to Zomato they pay 11 lakhs Rs/-
- Mumbai is the second highest commission price payer to Zomato they pay 10 lakhs Rs/-
- Chandigarh pay's the lowest commission price to Zomato they pay 1 lakh Rs/-

2. Restaurants with good rating and their peak time.

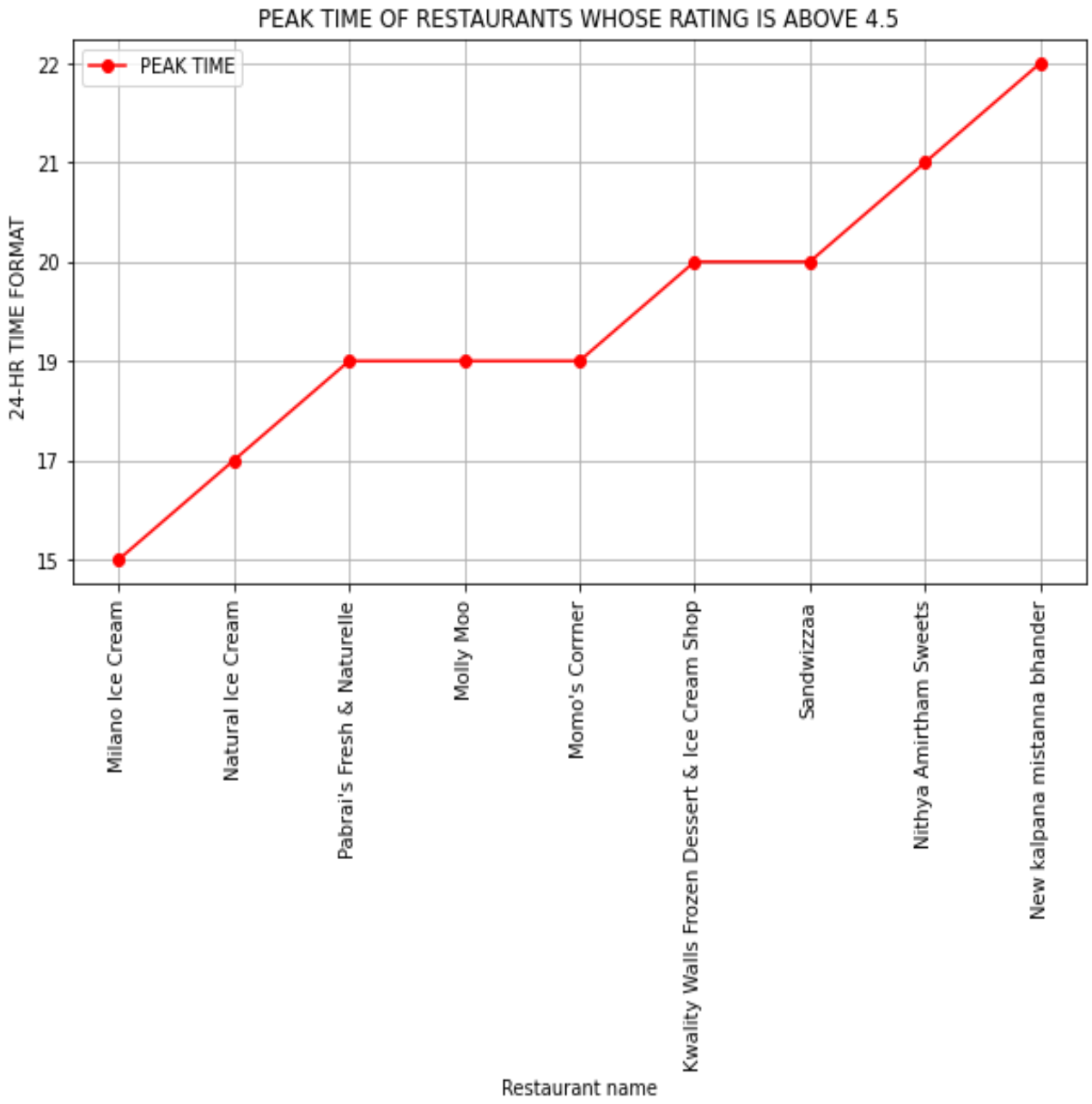

Fig 2: Peak time of Restaurants whose rating is above 4.5

Inference:

From the above graph we can say that during their peak time restaurant can send the advertisement to the customers through the food delivery applications or by using any other resources.

3. Distribution of Restaurant type

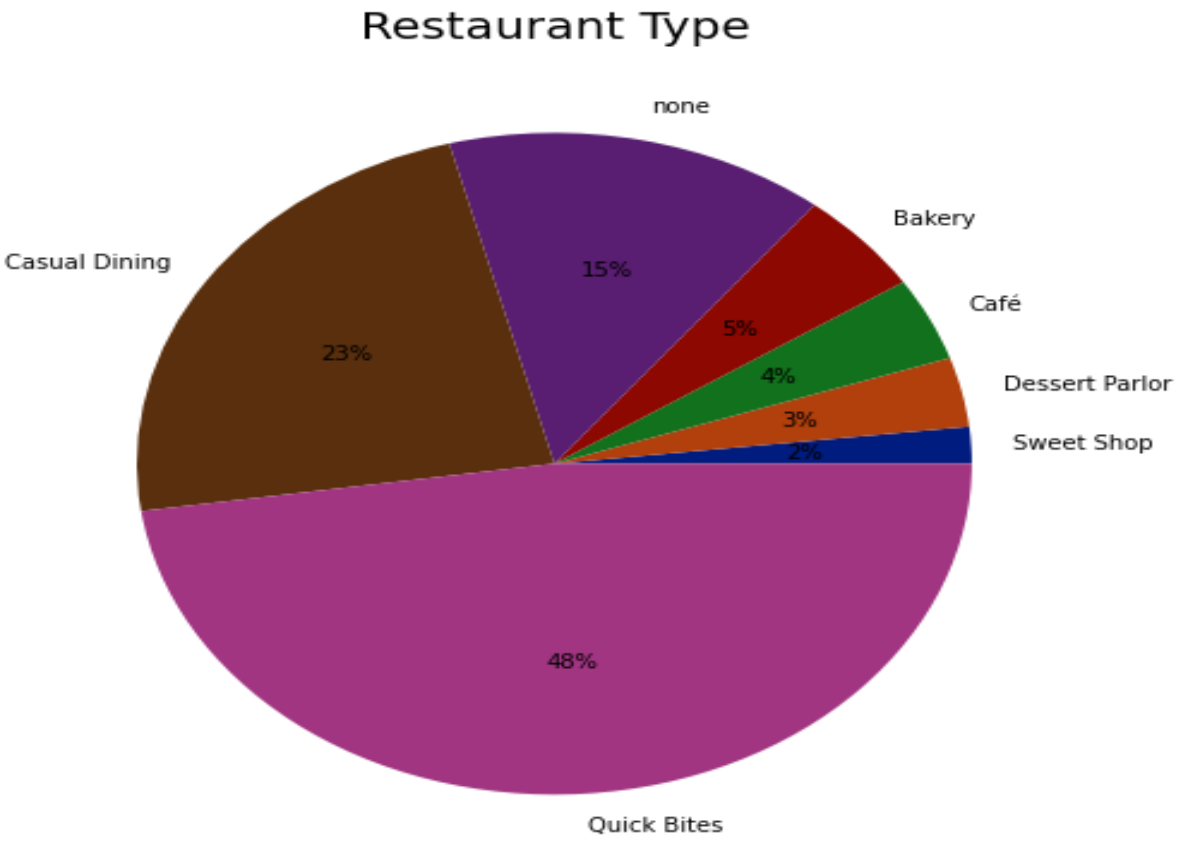

Fig 3: Restaurant Type Distribution in India

Inference:

The Restaurants in Top Cities are of type Quick bites i.e., of 48% and Casual Dining i.e., of 23% and Delivery i.e., of 15%.

4. Most Famous Restaurants Chains in Metro Cities.

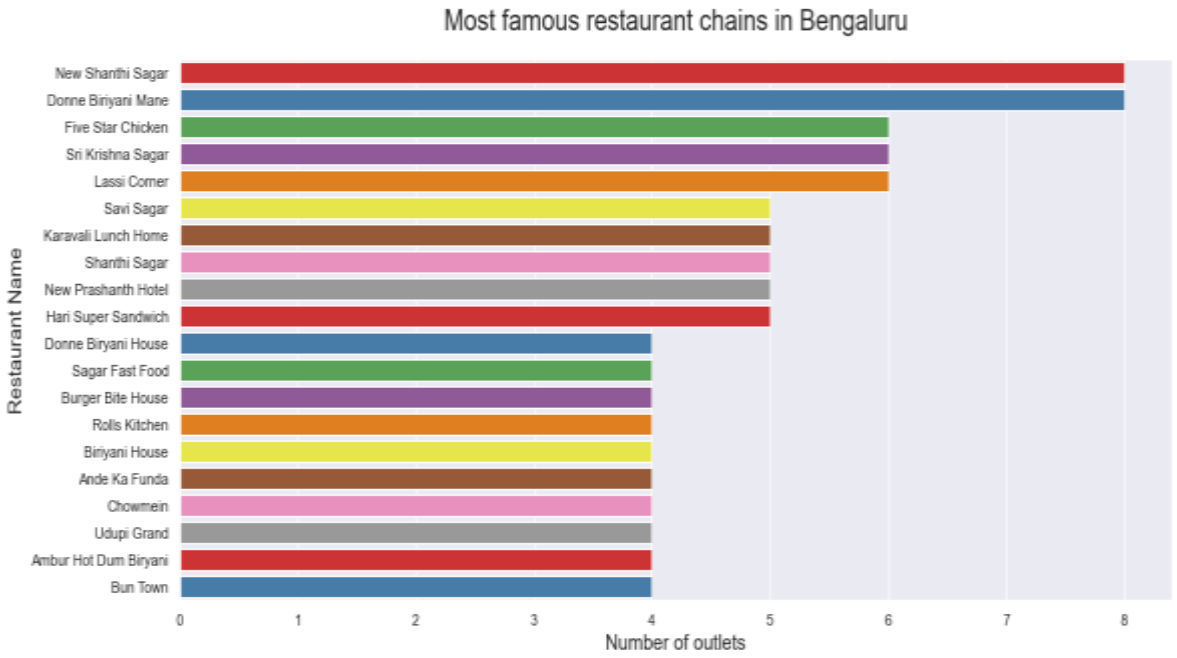

Fig 4a: Restaurant Chains in Bengaluru

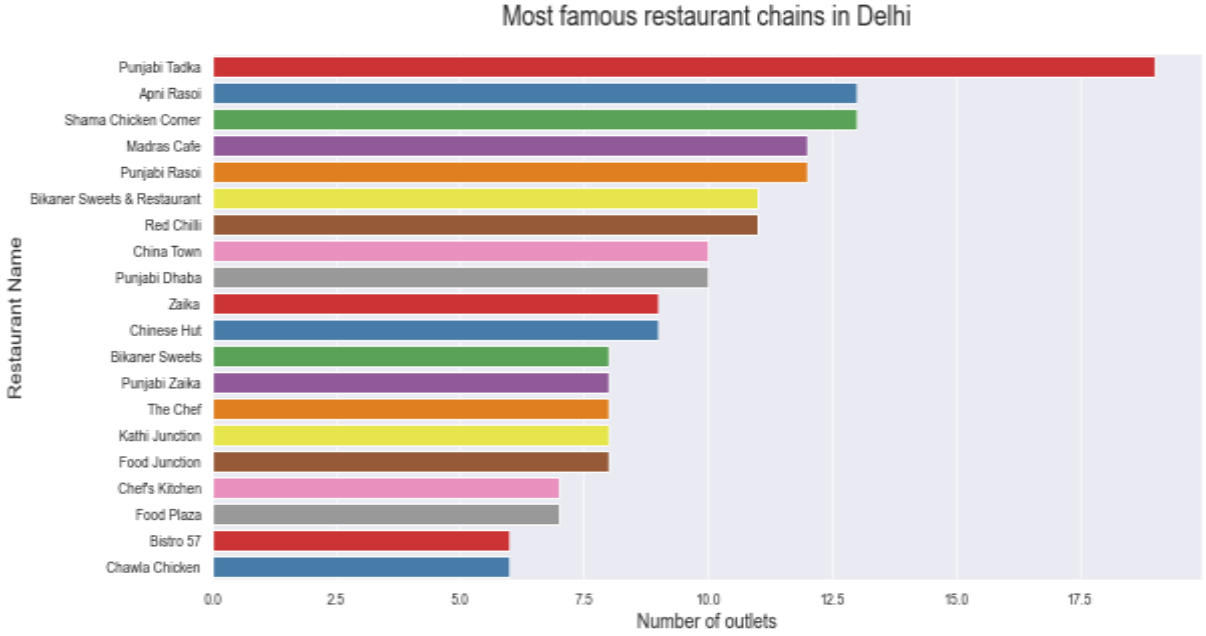

Fig 4b: Restaurant Chains in Delhi

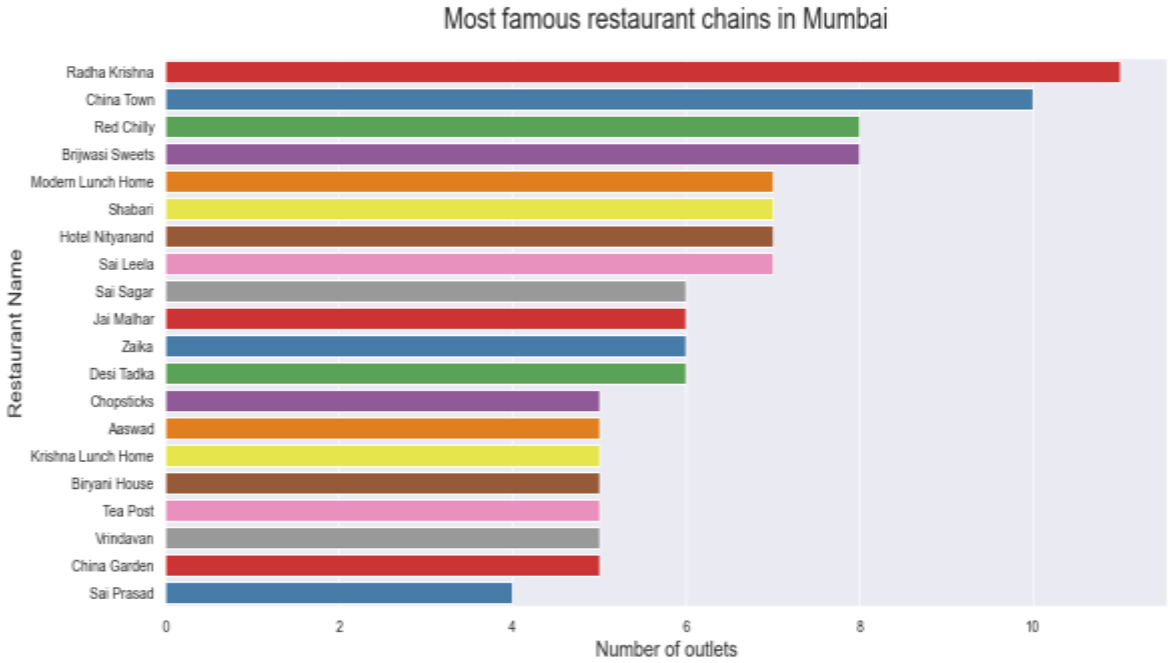

Fig 4c: Restaurant Chains in Mumbai

Inference:

- In Bengaluru New Shanti Sagar and has Donne Biriyani Mane has maximum number of outlets in Bengaluru i.e., totally 8 outlets across Bengaluru.
- In Delhi Punjabi Tadka has maximum number of outlets in Delhi i.e., totally 18 outlets and second is Apni Rasoi with 13 outlets across Delhi.
- Radha Krishna has maximum number of outlets in Mumbai i.e., totally 11 outlets and second is China Town with 8 outlets across Mumbai.

5. In various cities price varying based upon the rating category.

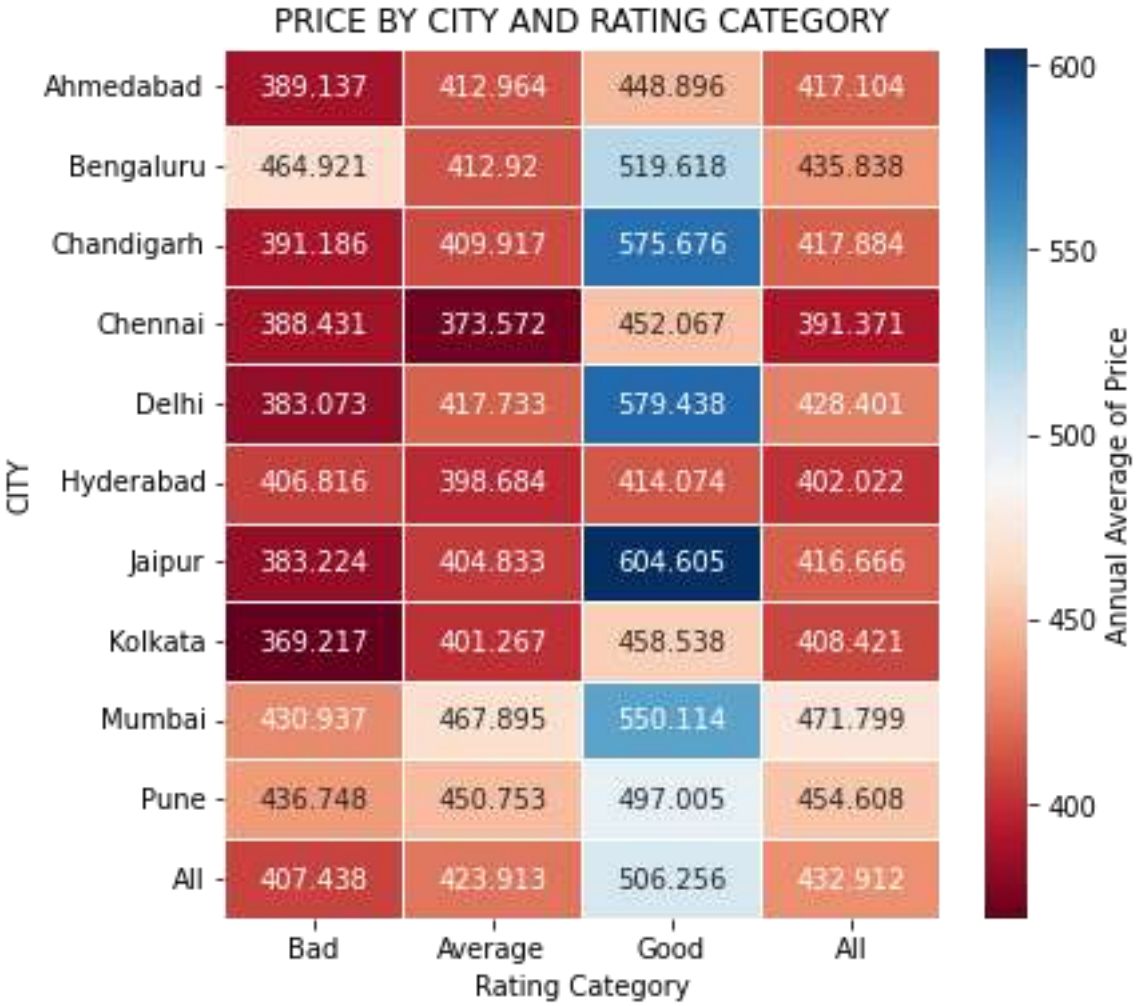

Fig 5: Annual Average of Price by city w.r.t to rating category.

Inference:

- In Chennai the price of the food cost nearly 400 Rs/- which is the lowest among the metropolitan cities.
- In Mumbai the price of the food cost nearly 480 Rs/- which is the costliest among the metropolitan cities.
- In Hydreabad the food is good and the price is also less compared to other cities.

6. In metropolitan cities and in non-metropolitan cities varying of price.

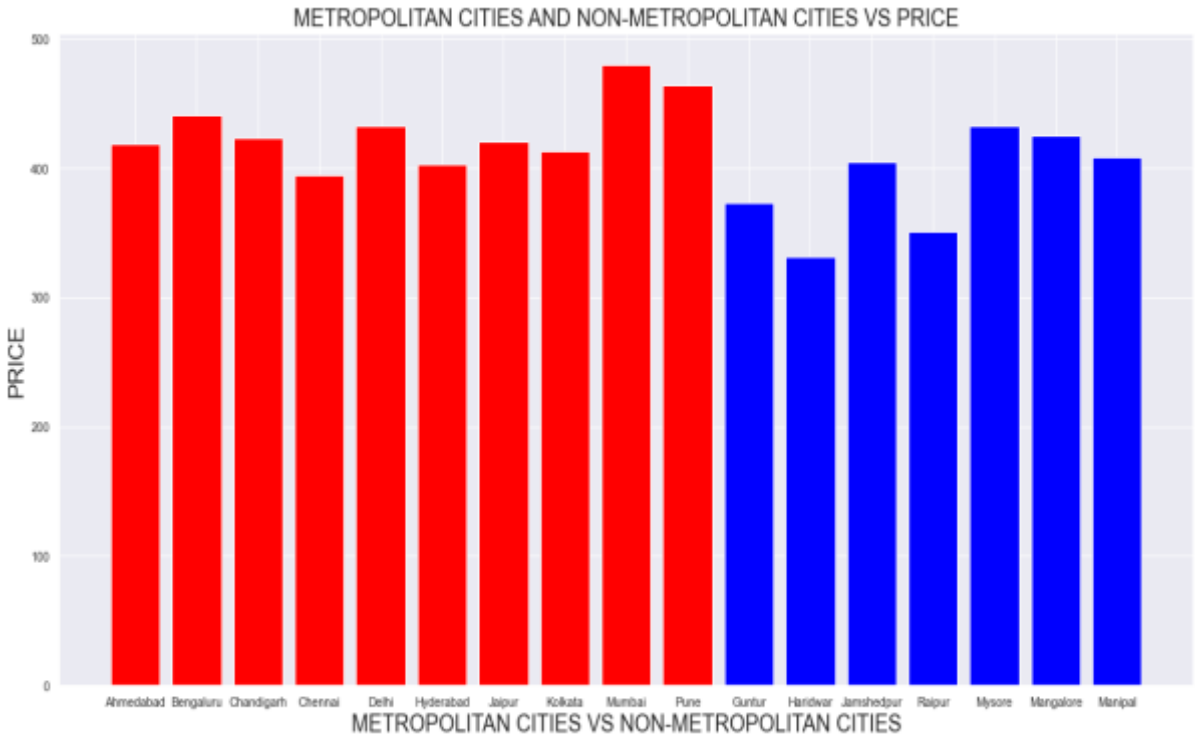

Fig6: Price(Rs/-) varying in metropolitan and non-metropolitan cities

Inference:

In the above bar graph the red bar represents the metropolitan cities where as the blue bar one represents the non-metropolitan cities, we can see that price of food is more in metropolitan cities compared to non-metropolitan cities.

CONCLUSION:

1. The city that paid the highest commission price to Zomato app for delivering the food from their restaurant to the customers is Delhi .
2. The restaurant can use their peak time the time at which the sales of restaurant is more and whenever it’s their peak time they can send a notification to their customers and attract new customers with good advertising of their restaurant.
3. The major type of restaurant in Metropolitan cities.
4. In Bengaluru, Mumbai and Delhi it is Shanti Sagar, Radha Krishnan and Punjabi Tadka respectively have the maximum number of food chains.
5. City wise the price varies based upon the rating category.
6. In metropolitan and in non-metropolitan cities price of the food varies very less.

References:

These are the following sources from which we took the necessary help to complete the project.

- Pandas documentation
- NumPy documentation
- Matplotlib documentation
- Seaborn documentation Kaggle