```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns

df =pd.read_csv('/content/Dataset .csv')

df.head()
```

{"type":"dataframe","variable_name":"df"}

```python
df.shape
```

```
(9551, 21)
```

```python
df.isnull().sum()
```

```
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
```

```python
df.duplicated().sum()
```

```
0
```

```python
df.columns
```

```
Index(['Restaurant ID', 'Restaurant Name', 'Country Code', 'City',
'Address',
       'Locality', 'Locality Verbose', 'Longitude', 'Latitude',
'Cuisines',
       'Average Cost for two', 'Currency', 'Has Table booking',
       'Has Online delivery', 'Is delivering now', 'Switch to order
menu',
       'Price range', 'Aggregate rating', 'Rating color', 'Rating
text',
       'Votes'],
      dtype='object')
```

```
df.dtypes
```

```
Restaurant ID             int64
Restaurant Name          object
Country Code              int64
City                     object
Address                  object
Locality                 object
Locality Verbose         object
Longitude               float64
Latitude                float64
Cuisines                 object
Average Cost for two      int64
Currency                 object
Has Table booking        object
Has Online delivery      object
Is delivering now        object
Switch to order menu     object
Price range               int64
Aggregate rating        float64
Rating color             object
Rating text              object
Votes                     int64
dtype: object
```

```
df.nunique()
```

```
Restaurant ID           9551
Restaurant Name         7446
Country Code              15
City                     141
Address                 8918
Locality                1208
Locality Verbose        1265
Longitude               8120
Latitude                8677
Cuisines                1825
Average Cost for two     140
Currency                  12
Has Table booking          2
Has Online delivery        2
Is delivering now          2
Switch to order menu       1
Price range                4
Aggregate rating          33
```

```
Rating color                  6
Rating text                   6
Votes                      1012
dtype: int64
```

```
df['Switch to order menu'].unique()
```

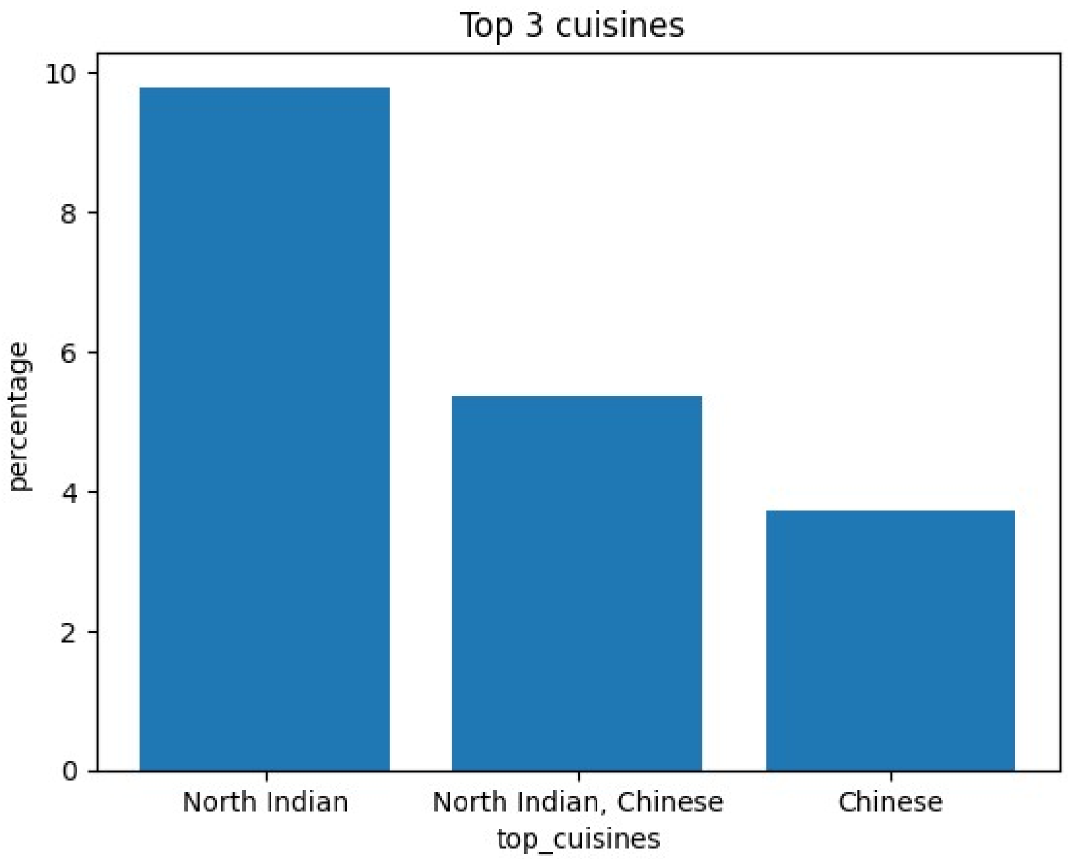
```
array(['No'], dtype=object)
```

LEVEL 1

Task 1 = Top Cusines

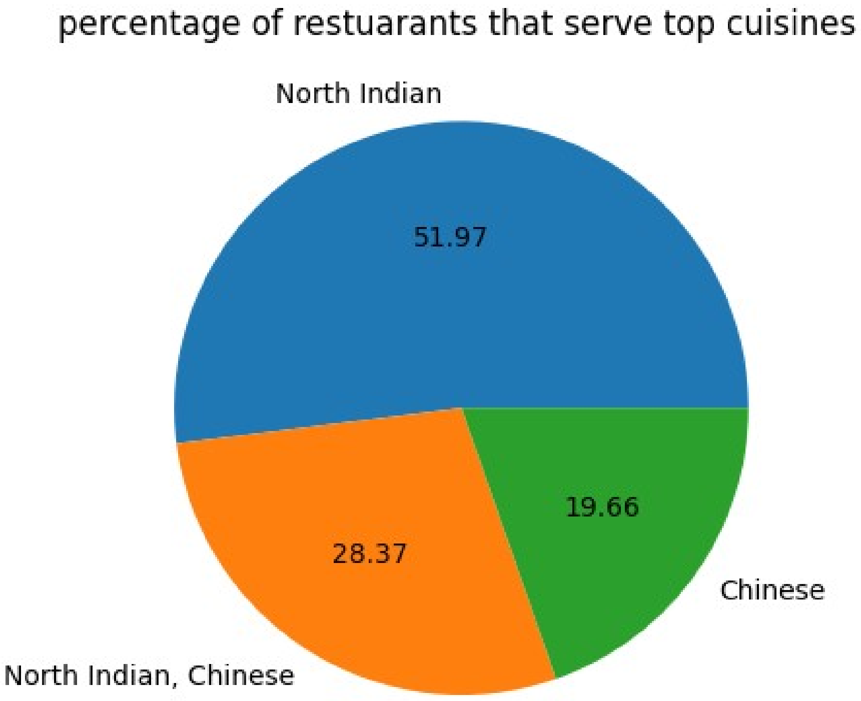
(a) - Determine the top three most common cuisines in the dataset.

```
# first go in the table then select the target column which is
cuisines

df['Cuisines']

# now will count the repeatd values
no_of_uniquevalues=df['Cuisines'].value_counts()

# then we will return only top 3 cuisines

top_3_cuisines = no_of_uniquevalues.head(3)
total_resturants = len(df)
percentage = (top_3_cuisines/total_resturants)*100
plt.bar(percentage.index, percentage.values )
plt.xlabel("top_cuisines")
plt.ylabel("percentage")
plt.title("Top 3 cuisines ")
plt.show()
```



(b) - Calculate the percentage of restaurants that serve each of the top cuisines.

```
# pie chart which says the %of resturants that serve of the top cuisines
plt.pie(top_3_cuisines, labels= top_3_cuisines.index, autopct="%.2f")
plt.title("percentage of restuarants that serve top cuisines ")
plt.show()
```



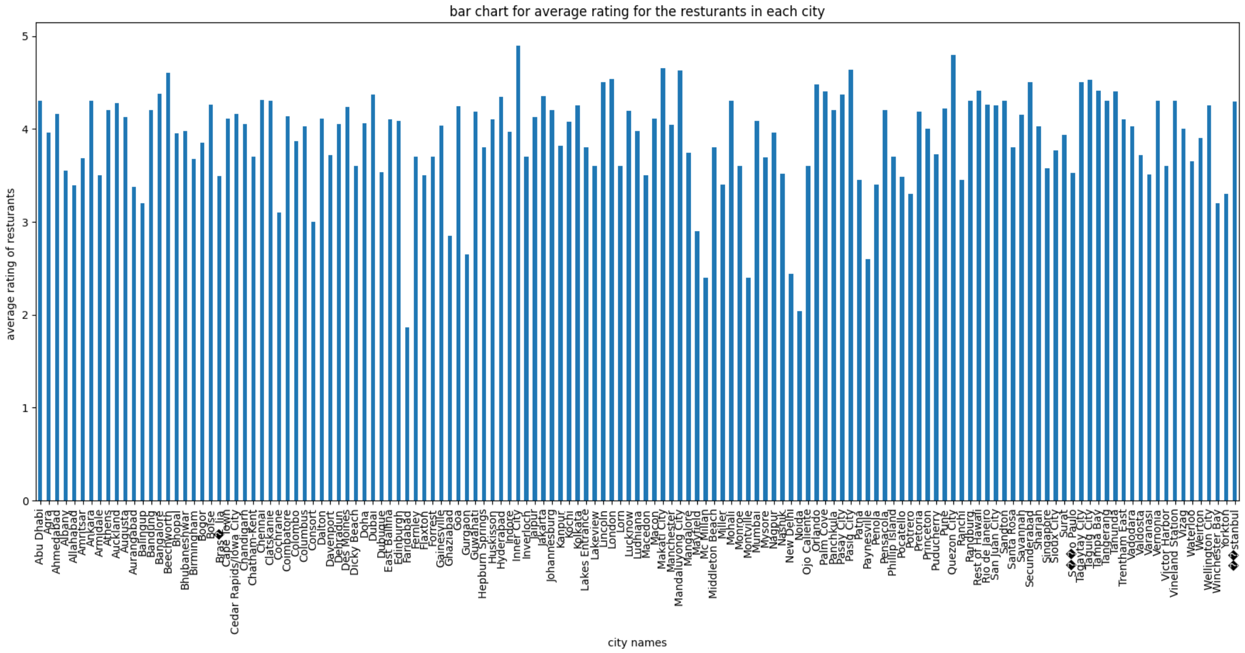
Task 2 = City Analysis

(a) - Identify the city with the highest number of restaurants in the dataset.

```
# checked the city names with the resturant counts
top_city = df['City'].value_counts()

# checked the total number of resturants
total_number_of_resturants = len(df)

#calculated the city name with the highest number of resrurants
large_no_of_resturant_wise_city_names = top_city.head(1)

print("the city name which has highest number of resturants 
is:",large_no_of_resturant_wise_city_names)

the city name which has highest number of resturants is: New Delhi 
5473
Name: City, dtype: int64
```

(b) - Calculate the average rating for restaurants in each city.

```
# calculated the average rating city wise
average_rating= df.groupby('City')['Aggregate rating'].mean()
average_rating.plot(kind= 'bar',figsize=(20,8))
plt.xlabel("city names")
plt.ylabel("average rating of resturants ")
plt.title("bar chart for average rating for the resturants in each
city")
plt.show()
```



(c) - Determine the city with the highest average rating.

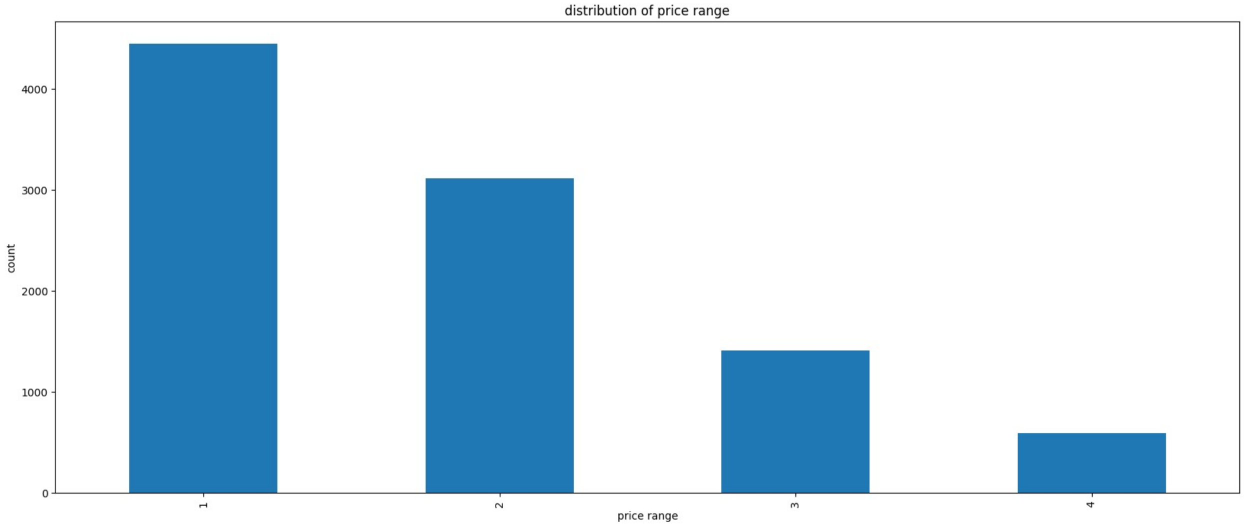
```
average_rating = df.groupby('City')['Aggregate rating'].mean()
city_wise_avg_rating = average_rating.idxmax()
highest_avg_rating =average_rating.max()
print("The city with the highest average rating is -
",city_wise_avg_rating , highest_avg_rating)

The city with the highest average rating is -  Inner City 4.9
```

Task 3 = Price range distribution

(A) - Create a histogram or bar chart to visualize the distribution of price ranges among the restaurants.

```
price_range_count= df['Price range'].value_counts().sort_index()
total_resturants = len(df)
```

```
percentage_per_price_range= (price_range_count/total_resturants)*100
price_range_count.plot(kind='bar', figsize=(20,8))
plt.xlabel("price range")
plt.ylabel("count")
plt.title("distribution of price range")

Text(0.5, 1.0, 'distribution of price range')
```



(B) - Calculate the percentage of restaurants in each price range category.

```
count_price_range= df['Price range'].value_counts()
total_restaurants= len(df)
percentage_of_each_price_range_category=
round((count_price_range/total_restaurants)*100)
print(percentage_of_each_price_range_category)

1    47.0
2    33.0
3    15.0
4     6.0
Name: Price range, dtype: float64
```

#Task 4 = Online Delivery

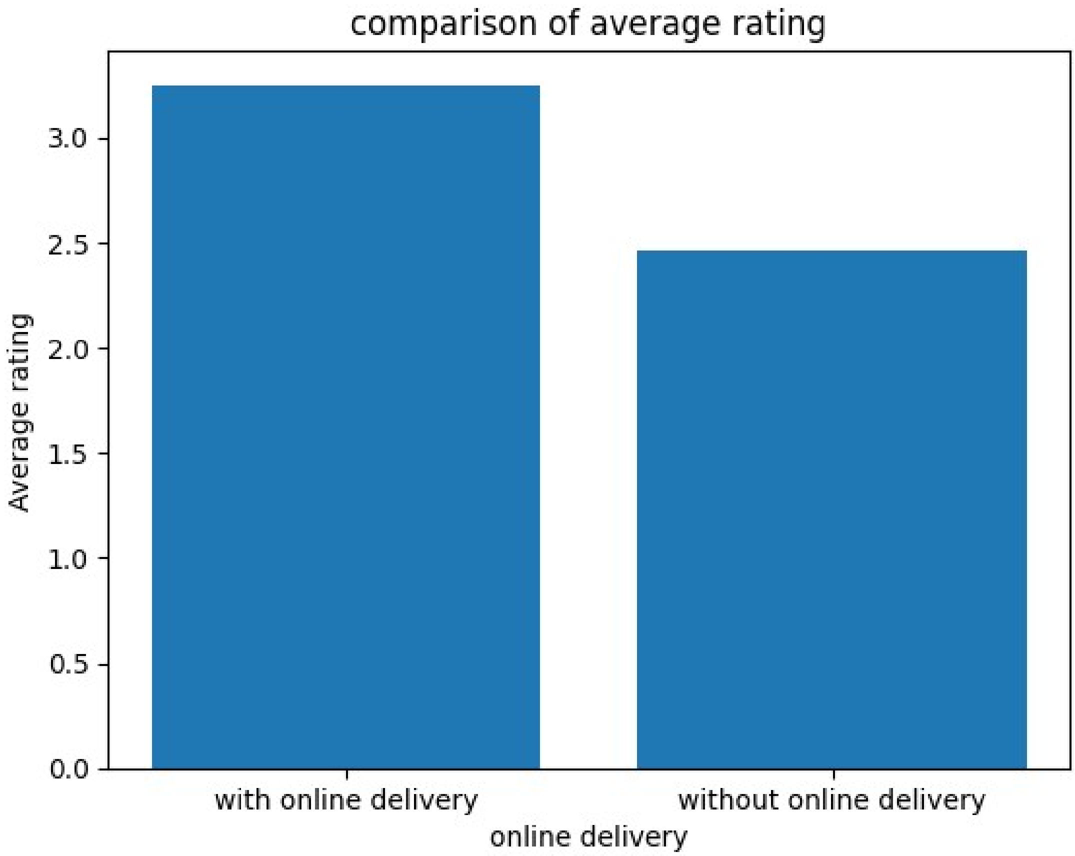
(a)- Determine the percentage of restaurants that offer online delivery.

```
count_online_delivery= df['Has Online
delivery'].value_counts().get("Yes",0)
percentage_of_restuarants_offer_online_delivery=
round((count_online_delivery/total_restaurants)*100)
```

```
print("the percentage of restaurants that offer online
delivery:-",percentage_of_restuarants_offer_online_delivery)

the percentage of restaurants that offer online delivery:- 26
```

(b) - Compare the average ratings of restaurants with and without online delivery.

```
# Average rating of restaurants with online delivery
average_rating_with_online = df[df['Has Online delivery'] == 'Yes']
['Aggregate rating'].mean()

# Average rating of restaurants without online delivery
average_rating_without_online = df[df['Has Online delivery'] == 'No']
['Aggregate rating'].mean()


print("Average rating of restaurants with online delivery:",
average_rating_with_online)
print("Average rating of restaurants without online delivery:",
average_rating_without_online)

#now comparision between both is
compare_with_or_without_online_delivery = average_rating_with_online -
average_rating_without_online
print("Compared the average ratings of restaurants with and without
online delivery is :", compare_with_or_without_online_delivery)
lables= ['with online delivery', 'without online delivery']
average_rating=
[average_rating_with_online,average_rating_without_online]
plt.bar(lables, average_rating)
plt.xlabel("online delivery")
plt.ylabel("Average rating")
plt.title("comparison of average rating")
plt.show()

Average rating of restaurants with online delivery: 3.2488372093023257
Average rating of restaurants without online delivery:
2.465295774647887
Compared the average ratings of restaurants with and without online
delivery is : 0.7835414346544387
```



LEVEL 2

Task 1 =Restaurant Ratings

(a) - Analyze the distribution of aggregate ratings and determine the most common rating range.

```
analyze_distribution_of_aggregate_rating = df['Aggregate
rating'].value_counts().sort_index()
most_common_rating_range =
analyze_distribution_of_aggregate_rating.idxmax()
print("the most common rating range is ",most_common_rating_range)
```

```
the most common rating range is  0.0
```

(b) - Calculate the average number of votes received by restaurants.

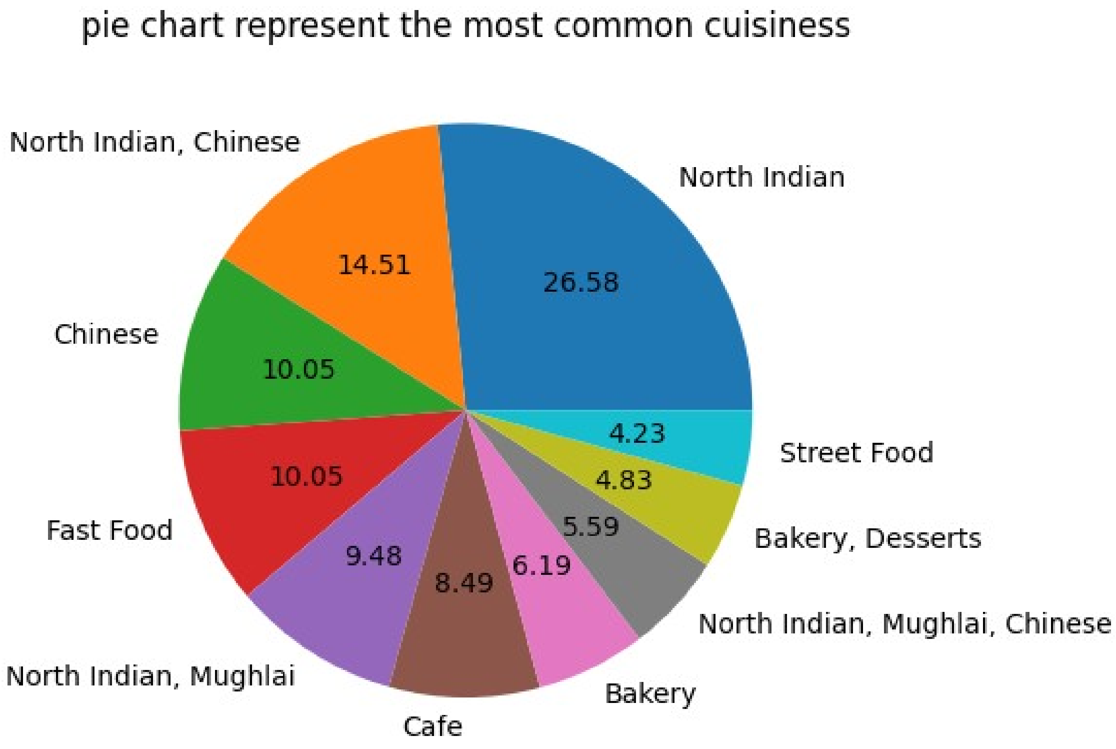
```
average_number_of_votes= df['Votes'].mean()
print("the average number of votes recieved by resturants
is :",average_number_of_votes)
```

```
the average number of votes recieved by resturants is :
156.909747670401
```

Task 2 = Cuisine Combination

(a)- Identify the most common combinations of cuisines in the dataset.

```
most_common_combination_of_cuisines=
df['Cuisines'].value_counts().head(10)

# print(" the most common combinations of cuisines in the
dataset.",most_common_combination_of_cuisines)

plt.pie(most_common_combination_of_cuisines,labels=
most_common_combination_of_cuisines.index,autopct="%.2f")

plt.title("pie chart represent the most common cuisiness")

plt.show()
```



(b) -Determine if certain cuisine combinations tend to have higher ratings.

```
cuisine_combination_avg_rate = df.groupby('Cuisines')['Aggregate
rating'].mean()
avg_rate_of_top10_cuisines= cuisine_combination_avg_rate.nlargest(10)
print("average rating for the top 10 cuisines")
print(avg_rate_of_top10_cuisines)
```

```
average rating for the top 10 cuisines
Cuisines
American, BBQ, Sandwich         4.9
American, Burger, Grill         4.9
American, Caribbean, Seafood    4.9
American, Coffee and Tea        4.9
American, Sandwich, Tea         4.9
BBQ, Breakfast, Southern        4.9
Burger, Bar Food, Steak         4.9
Continental, Indian             4.9
European, Asian, Indian         4.9
European, Contemporary          4.9
Name: Aggregate rating, dtype: float64
```

#Task 3= Geographic Analysis

Plot the locations of restaurants on a map using longitude and latitude coordinates.

Identify any patterns or clusters of restaurants in specific areas.

```
!pip install folium
```

```
Requirement already satisfied: folium in
/usr/local/lib/python3.10/dist-packages (0.14.0)
Requirement already satisfied: branca>=0.6.0 in
/usr/local/lib/python3.10/dist-packages (from folium) (0.7.1)
Requirement already satisfied: jinja2>=2.9 in
/usr/local/lib/python3.10/dist-packages (from folium) (3.1.3)
Requirement already satisfied: numpy in
/usr/local/lib/python3.10/dist-packages (from folium) (1.25.2)
Requirement already satisfied: requests in
/usr/local/lib/python3.10/dist-packages (from folium) (2.31.0)
Requirement already satisfied: MarkupSafe>=2.0 in
/usr/local/lib/python3.10/dist-packages (from jinja2>=2.9->folium)
(2.1.5)
Requirement already satisfied: charset-normalizer<4,>=2 in
/usr/local/lib/python3.10/dist-packages (from requests->folium)
(3.3.2)
Requirement already satisfied: idna<4,>=2.5 in
/usr/local/lib/python3.10/dist-packages (from requests->folium) (3.6)
Requirement already satisfied: urllib3<3,>=1.21.1 in
/usr/local/lib/python3.10/dist-packages (from requests->folium)
(2.0.7)
Requirement already satisfied: certifi>=2017.4.17 in
/usr/local/lib/python3.10/dist-packages (from requests->folium)
(2024.2.2)
```

```
import folium
from IPython.display import display
from sklearn.cluster import KMeans

restaurants_name = df['Restaurant Name']
latitude= df['Latitude']
longitude= df['Longitude']

X= df[["Latitude", 'Longitude']]
num_cluster = 5

kmeans= KMeans(num_cluster, random_state= 42)

df['Cluster']= kmeans.fit_predict(X)
```

```
/usr/local/lib/python3.10/dist-packages/sklearn/cluster/
_kmeans.py:870: FutureWarning: The default value of `n_init` will
change from 10 to 'auto' in 1.4. Set the value of `n_init` explicitly
to suppress the warning
  warnings.warn(
map_center =[latitude.mean(),longitude.mean()]
resturant_map = folium.Map(location= map_center, zoom_start=12)

cluster_colour= ['red','blue','green', 'purple', 'orange']

for index,row in df.iterrows():
  restaurants_name= row["Restaurant Name"]
  latitude = row["Latitude"]
  longitude= row['Longitude']
  cuisines = row['Cuisines']
  rating = row['Aggregate rating']
  cluster = row['Cluster']
  popular_text = f'Resturant: {restaurants_name}\n cuisiness:
{cuisines}\n Rating:{rating}'
  marker = folium.Marker([latitude, longitude],popular_text)
  marker.add_to(resturant_map)
  display(resturant_map)
```

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```
<folium.folium.Map at 0x79e4af1dfaf0>

----------------------------------------------------------------------
-----
KeyboardInterrupt                         Traceback (most recent call
last)
<ipython-input-33-3938edffd0c8> in <cell line: 1>()
      9   marker = folium.Marker([latitude, longitude],popular_text)
     10   marker.add_to(resturant_map)
---> 11   display(resturant_map)

/usr/local/lib/python3.10/dist-packages/IPython/core/display.py in
display(include, exclude, metadata, transient, display_id, *objs,
**kwargs)
    318             publish_display_data(data=obj, metadata=metadata,
**kwargs)
    319         else:
--> 320             format_dict, md_dict = format(obj,
include=include, exclude=exclude)
    321             if not format_dict:
    322                 # nothing to display (e.g. _ipython_display_
took over)

/usr/local/lib/python3.10/dist-packages/IPython/core/formatters.py in
format(self, obj, include, exclude)
    178             md = None
    179             try:
--> 180                 data = formatter(obj)
    181             except:
    182                 # FIXME: log the exception

<decorator-gen-2> in __call__(self, obj)

/usr/local/lib/python3.10/dist-packages/IPython/core/formatters.py in
catch_format_error(method, self, *args, **kwargs)
    222     """show traceback on failed format call"""
    223     try:
--> 224         r = method(self, *args, **kwargs)
    225     except NotImplementedError:
    226         # don't warn on NotImplementedErrors

/usr/local/lib/python3.10/dist-packages/IPython/core/formatters.py in
__call__(self, obj)
    343             method = get_real_method(obj, self.print_method)
    344             if method is not None:
--> 345                 return method()
    346             return None
    347         else:

/usr/local/lib/python3.10/dist-packages/folium/folium.py in
```

```
_repr_html_(self, **kwargs)
    317             self._parent = None
    318         else:
--> 319             out = self._parent._repr_html_(**kwargs)
    320         return out
    321 

/usr/local/lib/python3.10/dist-packages/branca/element.py in
_repr_html_(self, **kwargs)
    367     def _repr_html_(self, **kwargs):
    368         """Displays the Figure in a Jupyter notebook."""
--> 369         html = escape(self.render(**kwargs))
    370         if self.height is None:
    371             iframe = (

/usr/local/lib/python3.10/dist-packages/branca/element.py in
render(self, **kwargs)
    362         """Renders the HTML representation of the element."""
    363         for name, child in self._children.items():
--> 364             child.render(**kwargs)
    365         return self._template.render(this=self, kwargs=kwargs)
    366 

/usr/local/lib/python3.10/dist-packages/folium/folium.py in
render(self, **kwargs)
    399         )
    400 
--> 401         super().render(**kwargs)
    402 
    403     def show_in_browser(self):

/usr/local/lib/python3.10/dist-packages/folium/elements.py in
render(self, **kwargs)
     20             figure.header.add_child(CssLink(url), name=name)
     21 
---> 22         super().render(**kwargs)

/usr/local/lib/python3.10/dist-packages/branca/element.py in
render(self, **kwargs)
    679 
    680         for name, element in self._children.items():
--> 681             element.render(**kwargs)

/usr/local/lib/python3.10/dist-packages/folium/map.py in render(self)
    352                 )
    353             )
--> 354         super().render()
    355 
    356 
```

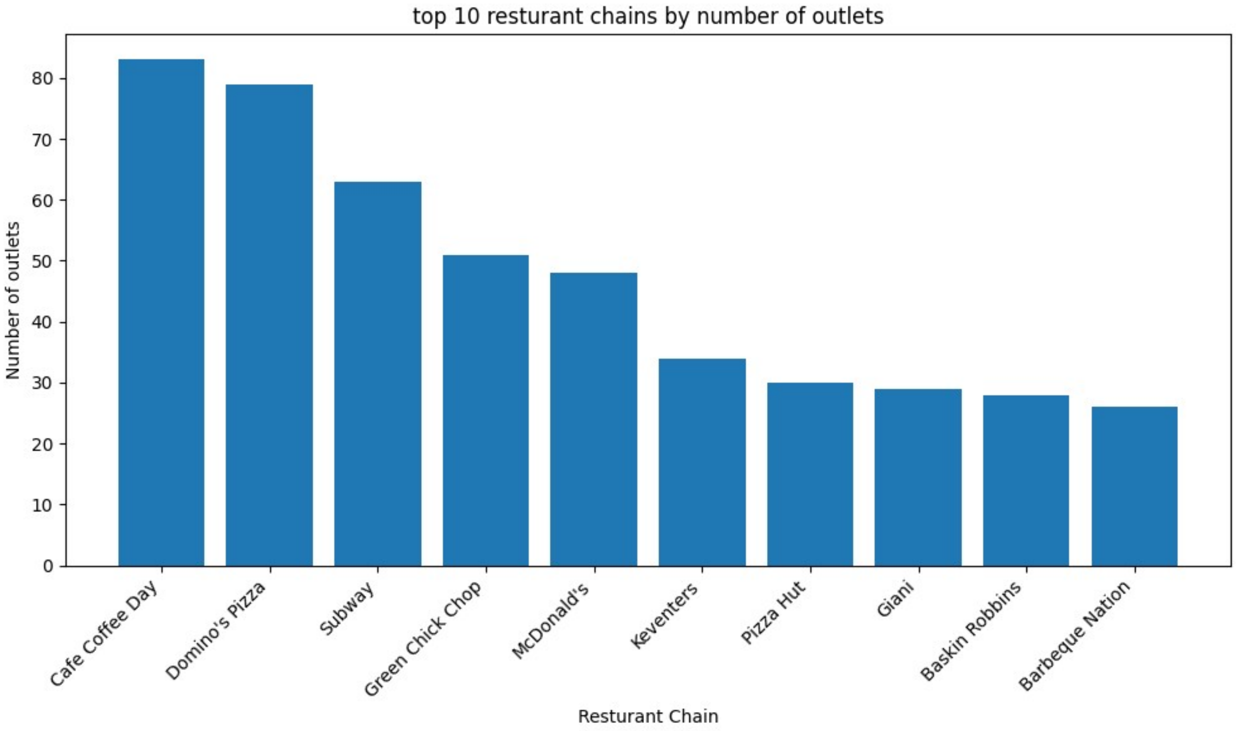
```
/usr/local/lib/python3.10/dist-packages/branca/element.py in
render(self, **kwargs)
    676         script = self._template.module.__dict__.get("script",
None)
    677         if script is not None:
--> 678             figure.script.add_child(Element(script(self,
kwargs)), name=self.get_name())
    679 
    680         for name, element in self._children.items():

/usr/local/lib/python3.10/dist-packages/branca/element.py in
__init__(self, template, template_name)
     61 
     62         if template is not None:
---> 63             self._template = Template(template)
     64         elif template_name is not None:
     65             self._template = ENV.get_template(template_name)

/usr/local/lib/python3.10/dist-packages/jinja2/environment.py in
__new__(cls, source, block_start_string, block_end_string,
variable_start_string, variable_end_string, comment_start_string,
comment_end_string, line_statement_prefix, line_comment_prefix,
trim_blocks, lstrip_blocks, newline_sequence, keep_trailing_newline,
extensions, optimized, undefined, finalize, autoescape, enable_async)
   1206             enable_async,
   1207         )
-> 1208         return env.from_string(source, template_class=cls)
   1209 
   1210     @classmethod

/usr/local/lib/python3.10/dist-packages/jinja2/environment.py in
from_string(self, source, globals, template_class)
   1103         gs = self.make_globals(globals)
   1104         cls = template_class or self.template_class
-> 1105         return cls.from_code(self, self.compile(source), gs,
None)
   1106 
   1107     def make_globals(

/usr/local/lib/python3.10/dist-packages/jinja2/environment.py in
compile(self, source, name, filename, raw, defer_init)
    764             if filename is None:
    765                 filename = "<template>"
--> 766             return self._compile(source, filename)
    767         except TemplateSyntaxError:
    768             self.handle_exception(source=source_hint)

/usr/local/lib/python3.10/dist-packages/jinja2/environment.py in
_compile(self, source, filename)
    702         .. versionadded:: 2.5
    703         """
--> 704         return compile(source, filename, "exec")
    705 
    706     @typing.overload

KeyboardInterrupt: 
```

#Task 4 = Task: Restaurant Chains

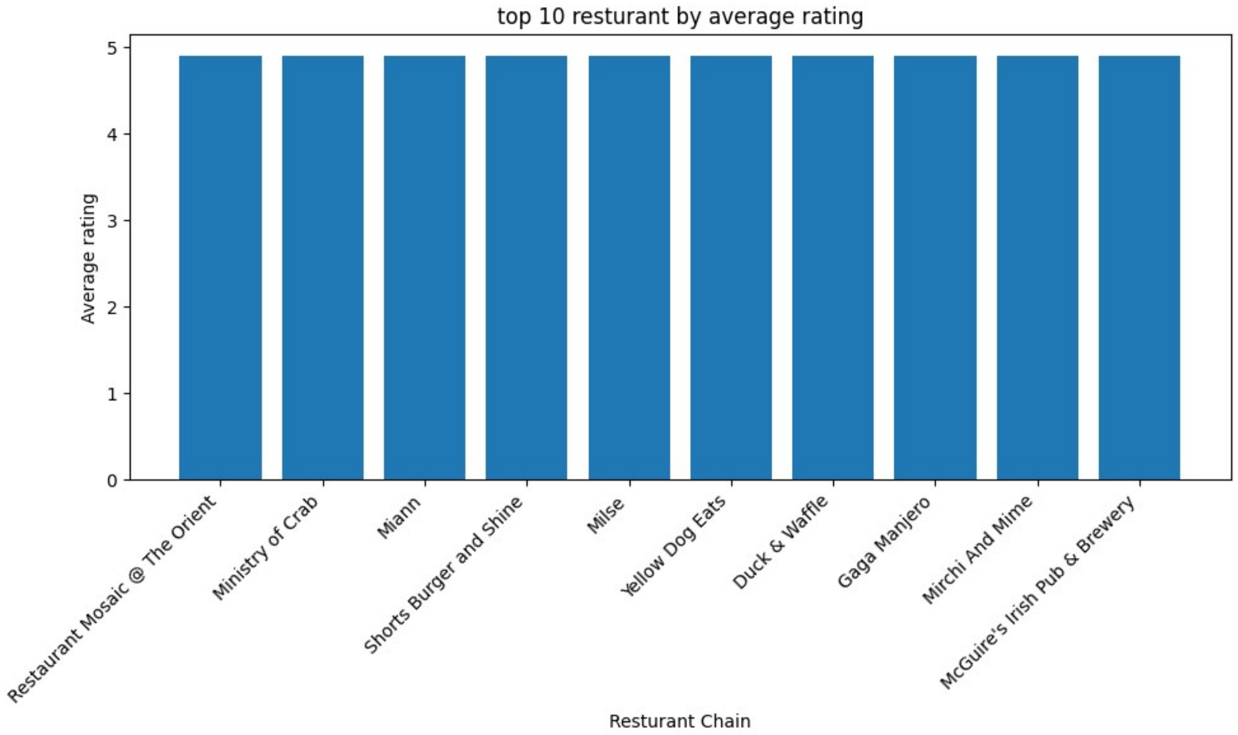
Identify if there are any restaurant chains present in the dataset.

Analyze the ratings and popularity of different restaurant chains.

```python
resturant_chains = df.groupby('Restaurant Name').size().reset_index(name="Chain Count")
resturant_chains= resturant_chains[resturant_chains['Chain Count']>1]
resturant_chains = resturant_chains.sort_values(by = "Chain Count", ascending= False)

plt.figure(figsize= (10,6))
plt.bar(resturant_chains['Restaurant Name'][:10], resturant_chains['Chain Count'][:10])
plt.xticks(rotation=45,ha='right')
plt.xlabel("Resturant Chain")
plt.ylabel("Number of outlets")
plt.title("top 10 resturant chains by number of outlets")
plt.tight_layout()
plt.show()
```



```
chain_rating = df.groupby('Restaurant Name')['Aggregate rating'].mean().reset_index(name="Average Rating")
chain_votes= df.groupby('Restaurant Name')['Votes'].sum().reset_index(name="Total Votes")

chain_analysis= pd.merge(chain_rating, chain_votes , on ="Restaurant Name")
chain_analysis= chain_analysis.sort_values(by= "Average Rating", ascending= False)

plt.figure(figsize= (10,6))
plt.bar(chain_analysis['Restaurant Name'][:10], chain_analysis['Average Rating'][:10])
plt.xticks(rotation=45,ha='right')
plt.xlabel("Resturant Chain")
plt.ylabel("Average rating")
plt.title("top 10 resturant by average rating")
plt.tight_layout()
plt.show()
```



LEVEL 3

#TASK 1 Restaurant Reviews

Analyze the text reviews to identify the most common positive and negative keywords.

Calculate the average length of reviews and explore if there is a relationship between review length and rating.

```
! install nltk
import nltk

nltk.download('stopwords')
nltk.download('punkt')
```

```
install: missing destination file operand after 'nltk'
Try 'install --help' for more information.

[nltk_data] Downloading package stopwords to /root/nltk_data...
[nltk_data]   Package stopwords is already up-to-date!
[nltk_data] Downloading package punkt to /root/nltk_data...
[nltk_data]   Package punkt is already up-to-date!

True
```

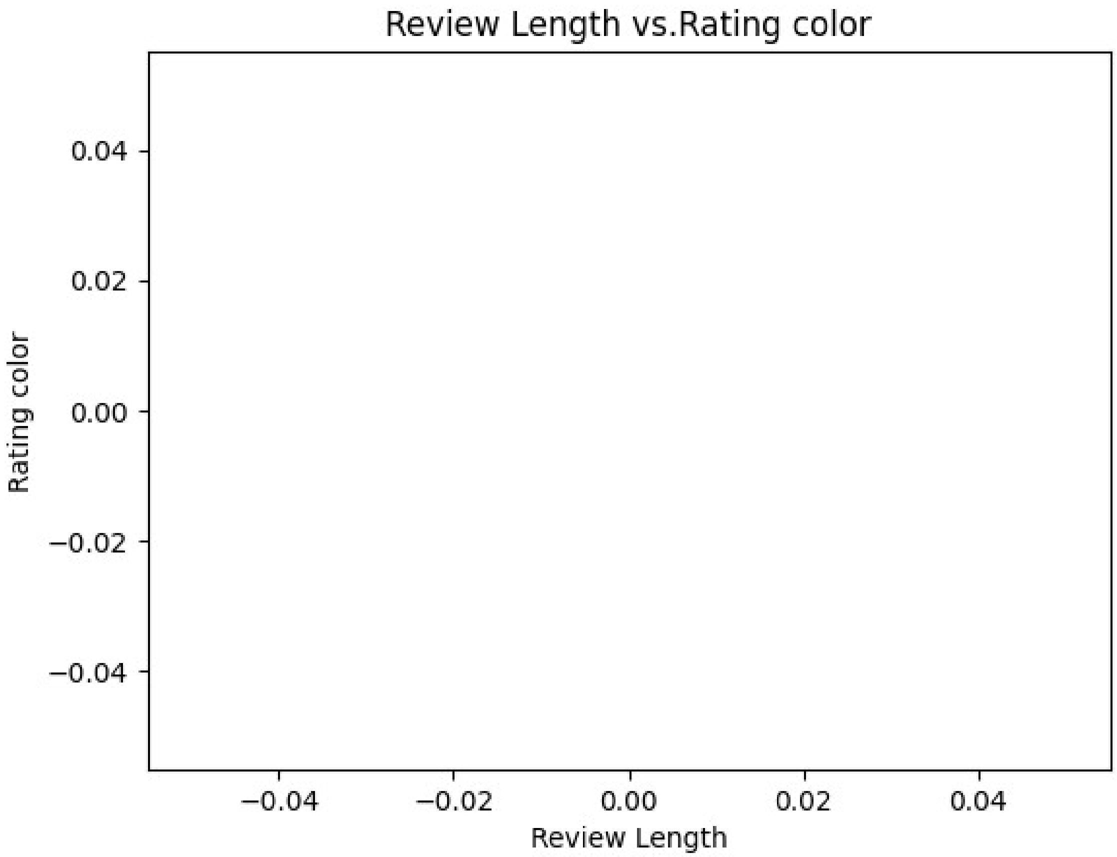
```python
import pandas as pd
import nltk
from nltk.corpus import stopwords
from nltk.sentiment.vader import SentimentIntensityAnalyzer


reviews = df['Rating text']
nltk.download('vader_lexicon')
df['Review text'] = df['Rating text'].fillna('')
sentiment_analyzer = SentimentIntensityAnalyzer()
```

```
[nltk_data] Downloading package vader_lexicon to /root/nltk_data...
```

```python
def get_sentiment_score(text):
    return sentiment_analyzer.polarity_scores(text)['compound']

df['Sentiment Score'] = reviews.apply(get_sentiment_score)
df['Sentiment'] = df['Sentiment Score'].apply(lambda score: 'Positive' if score >= 0 else 'Negative')

positive_keywords = {}
negative_keywords = {}

stop_words = set(stopwords.words('english'))

for index, row in df.iterrows():
    words = nltk.word_tokenize(row['Review text'].lower())
    filtered_words = [word for word in words if word.isalpha() and word not in stop_words]

    for word in filtered_words:
        if row['Sentiment'] == 'Positive':
            positive_keywords[word] = positive_keywords.get(word, 0) + 1
        else:
            negative_keywords[word] = negative_keywords.get(word, 0) + 1

top_positive_keywords = dict(sorted(positive_keywords.items(), key=lambda item: item[1], reverse=True)[:10])
top_negative_keywords = dict(sorted(negative_keywords.items(), key=lambda item: item[1], reverse=True)[:10])


print("Top 10 Positive Keywords:", top_positive_keywords)
print("Top 10 Negative Keywords:", top_negative_keywords)
```

```
Top 10 Positive Keywords: {'average': 3737, 'good': 3179, 'rated': 2148, 'excellent': 301}
Top 10 Negative Keywords: {'poor': 186}
```

```
df['Review Length'] = df['Review text'].apply(lambda x:
len(nltk.word_tokenize(x)))
average_review_length = df['Review Length'].mean()

print("Average Review Length:", average_review_length)
df['Rating color'] = pd.to_numeric(df['Rating color'],
errors='coerce')
average_length_by_rating = df.groupby('Rating color')['Review
Length'].mean()
plt.scatter(df['Review Length'], df['Rating color'])
plt.xlabel('Review Length')
plt.ylabel('Rating color')
plt.title('Review Length vs.Rating color')
plt.show()

Average Review Length: 1.3378703800649148
```



```
correlation_coefficient = df['Review Length'].corr(df['Rating color'])
print("Correlation Coefficient between Review Length and Rating
color:", correlation_coefficient)

Correlation Coefficient between Review Length and Rating color: nan
```

#TASK 2

Votes Analysis

Identify the restaurants with the highest and lowest number of votes.

Analyze if there is a correlation between the number of votes and the rating of a restaurant.

```
restaurant_with_highest_votes = df.loc[df["Votes"].idxmax()]
restaurant_with_lowest_votes = df.loc[df["Votes"].idxmin()]
print("Restaurant with the highest number of votes:")
print(restaurant_with_highest_votes)
```

```
Restaurant with the highest number of votes:
Restaurant ID
51705
Restaurant Name
Toit
Country Code
1
City
Bangalore
Address                 298, Namma Metro Pillar 62, 100 Feet Road,
Ind...
Locality
Indiranagar
Locality Verbose                                   Indiranagar,
Bangalore
Longitude
77.640709
Latitude
12.979166
Cuisines                                         Italian, American,
Pizza
Average Cost for two
2000
Currency                                               Indian
Rupees(Rs.)
Has Table booking
No
Has Online delivery
No
Is delivering now
No
Switch to order menu
No
Price range
4
Aggregate rating
```

```
4.8
Rating color
NaN
Rating text
Excellent
Votes
10934
Cluster
0
Review text
Excellent
Sentiment Score
0.5719
Sentiment
Positive
Review Length
1
Name: 728, dtype: object
```

```python
print("\nRestaurant with the lowest number of votes:")
print(restaurant_with_lowest_votes)
```

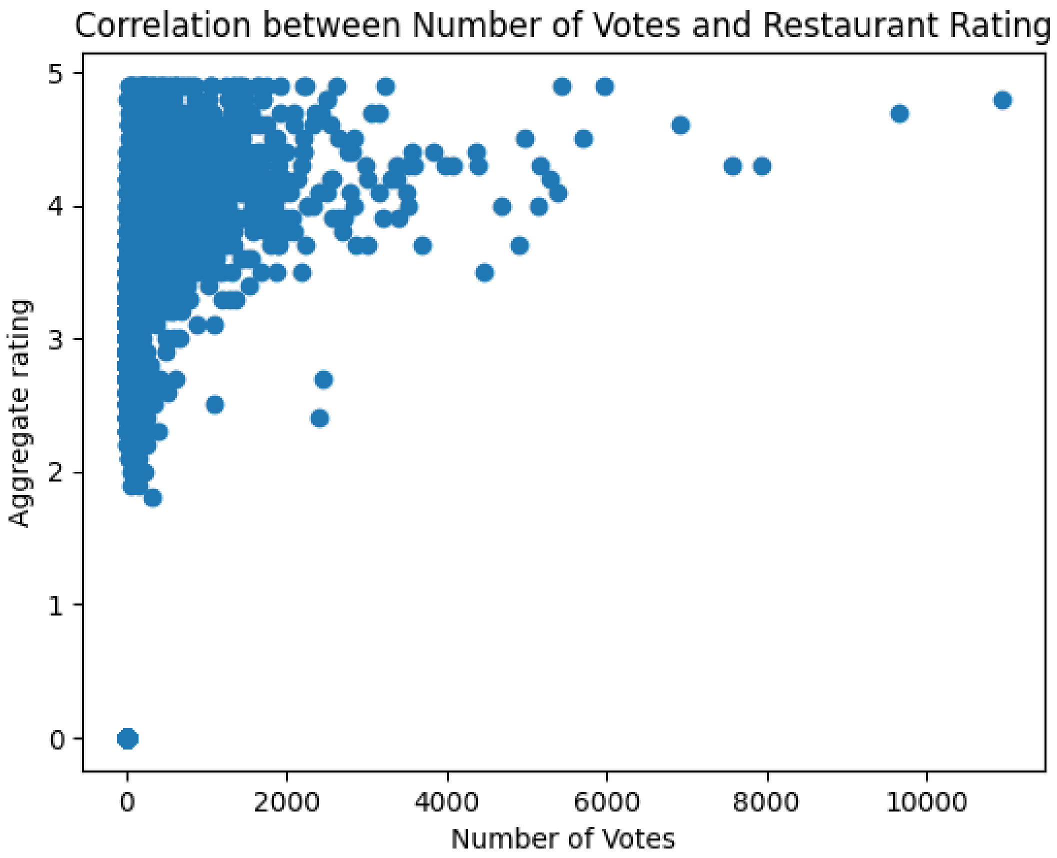
```
Restaurant with the lowest number of votes:
Restaurant ID
6710645
Restaurant Name                                          Cantinho da
Gula
Country Code
30
City                                                           S��o
Paulo
Address                 Rua Pedroso Alvarenga, 522, Itaim Bibi, S��o
P...
Locality                                                       Itaim
Bibi
Locality Verbose                                   Itaim Bibi, S��o
Paulo
Longitude                                                      -
46.675667
Latitude                                                          -
23.581
Cuisines
Brazilian
Average Cost for two
55
Currency                                               Brazilian
Real(R$)
Has Table booking
No
```

```
Has Online delivery
No
Is delivering now
No
Switch to order menu
No
Price range
2
Aggregate rating
0.0
Rating color
NaN
Rating text                                                     Not
rated
Votes
0
Cluster
2
Review text                                                     Not
rated
Sentiment Score
0.0
Sentiment
Positive
Review Length
2
Name: 69, dtype: object
```

```
df["Votes"] = pd.to_numeric(df["Votes"])
df["Aggregate rating"] = pd.to_numeric(df["Aggregate rating"])
correlation = df["Votes"].corr(df["Aggregate rating"])
print("\nCorrelation between number of votes and rating:",
correlation)
```

```

Correlation between number of votes and rating: 0.31369058419541157
```

```
plt.scatter(df["Votes"], df["Aggregate rating"])
plt.xlabel("Number of Votes")
plt.ylabel("Aggregate rating")
plt.title("Correlation between Number of Votes and Restaurant Rating")
plt.show()
```



TASK 3

Task: Price Range vs. Online Delivery and Table Booking

Analyze if there is a relationship between the price range and the availability of online delivery and table booking.

Determine if higher-priced restaurants are more likely to offer these services.

```
price_ranges = df["Price range"].unique()
online_delivery_percentages = []
for price_range in price_ranges:
    restaurants_with_delivery = df[(df["Price range"] == price_range)
& (df["Has Online delivery"] == True)]
    total_restaurants = len(df[df["Price range"] == price_range])
    percentage_with_delivery = (len(restaurants_with_delivery) /
total_restaurants) * 100
    online_delivery_percentages.append(percentage_with_delivery)
table_booking_percentages = []
```

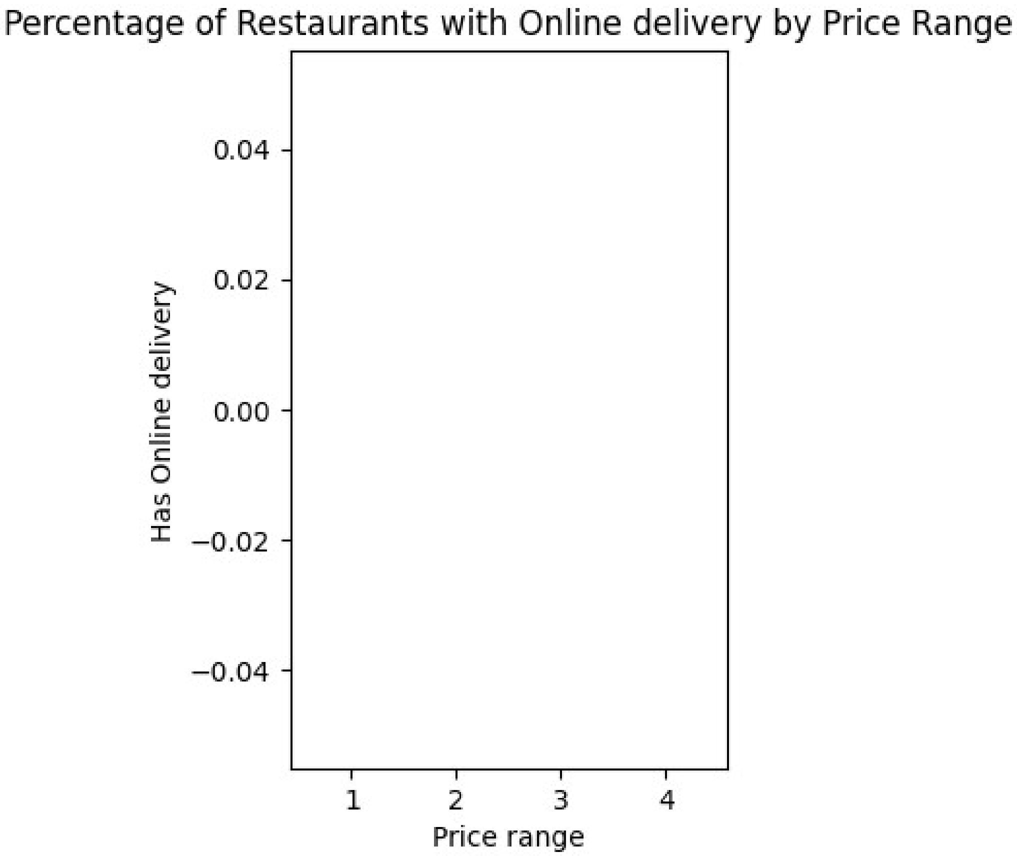
```python
for price_range in price_ranges:
    restaurants_with_table_booking = df[(df["Price range"] ==
price_range) & (df["Has Table booking"] == True)]
    total_restaurants = len(df[df["Price range"] == price_range])
    percentage_with_table_booking =
(len(restaurants_with_table_booking) / total_restaurants) * 100
    table_booking_percentages.append(percentage_with_table_booking)

plt.figure(figsize=(10, 5))
```

```
<Figure size 1000x500 with 0 Axes>
```

```
<Figure size 1000x500 with 0 Axes>
```

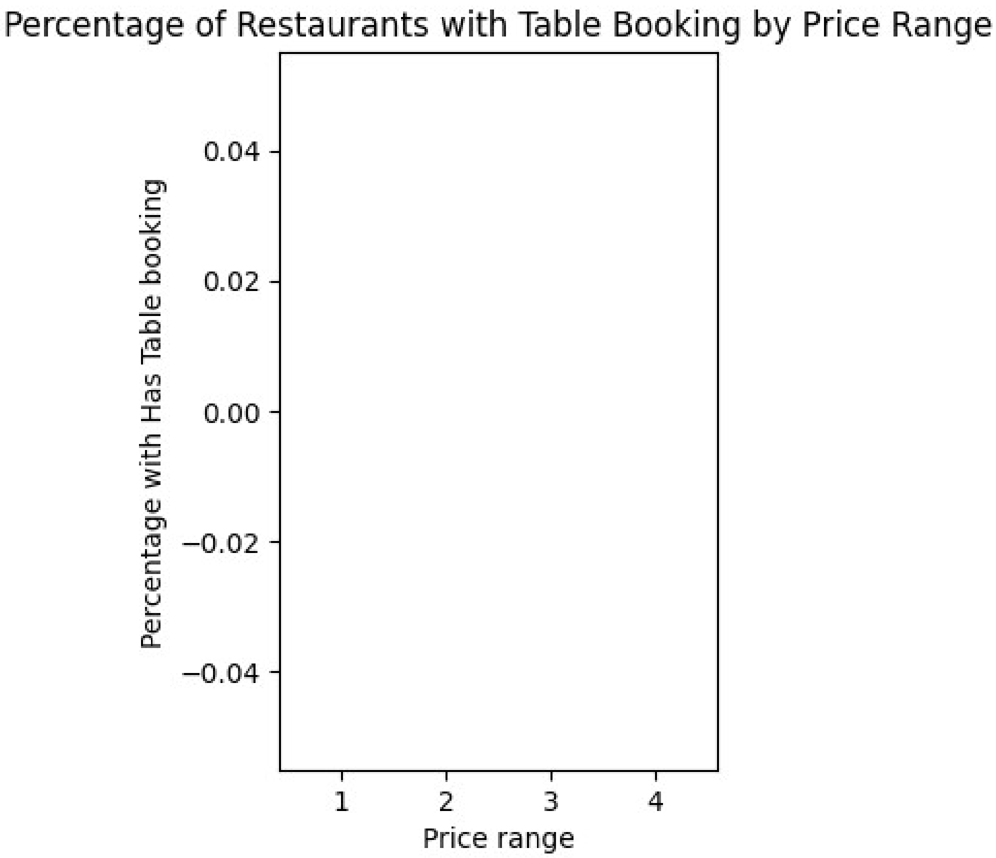
```python
plt.subplot(1, 2, 1)
plt.bar(price_ranges, online_delivery_percentages)
plt.xlabel("Price range")
plt.ylabel("Has Online delivery")
plt.title("Percentage of Restaurants with Online delivery by Price
Range")
```

```
Text(0.5, 1.0, 'Percentage of Restaurants with Online delivery by
Price Range')
```



```
plt.subplot(1, 2, 2)
plt.bar(price_ranges, table_booking_percentages)
plt.xlabel("Price range")
plt.ylabel("Percentage with Has Table booking")
plt.title("Percentage of Restaurants with Table Booking by Price
Range")
```

```
Text(0.5, 1.0, 'Percentage of Restaurants with Table Booking by Price
Range')
```


Percentage of Restaurants with Table Booking by Price Range
Percentage with Has Table booking
Price range